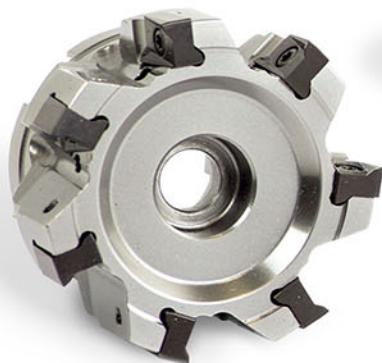




Catalogue

Version 2018
Milling



ZCC Cutting Tools Europe GmbH

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WELCOME TO ZCC CUTTING TOOLS EUROPE

ZCC-CT, one of the World's leading carbide tooling manufacturers, welcomes you to its products. We are able to offer you a wide product range of high performance cutting tools at economic prices and a good supply service to support the production and productivity at your manufacturing facilities. You will find the main tool types in the various sections of the catalogue, Turning is in section A, Milling in section B and Drilling in section C of the catalogue.

We are looking forward to working with you and developing good cooperation together. Our team at ZCC Cutting Tools Europe is ready to support you in all of your requirements.





Member of Minmetals Group



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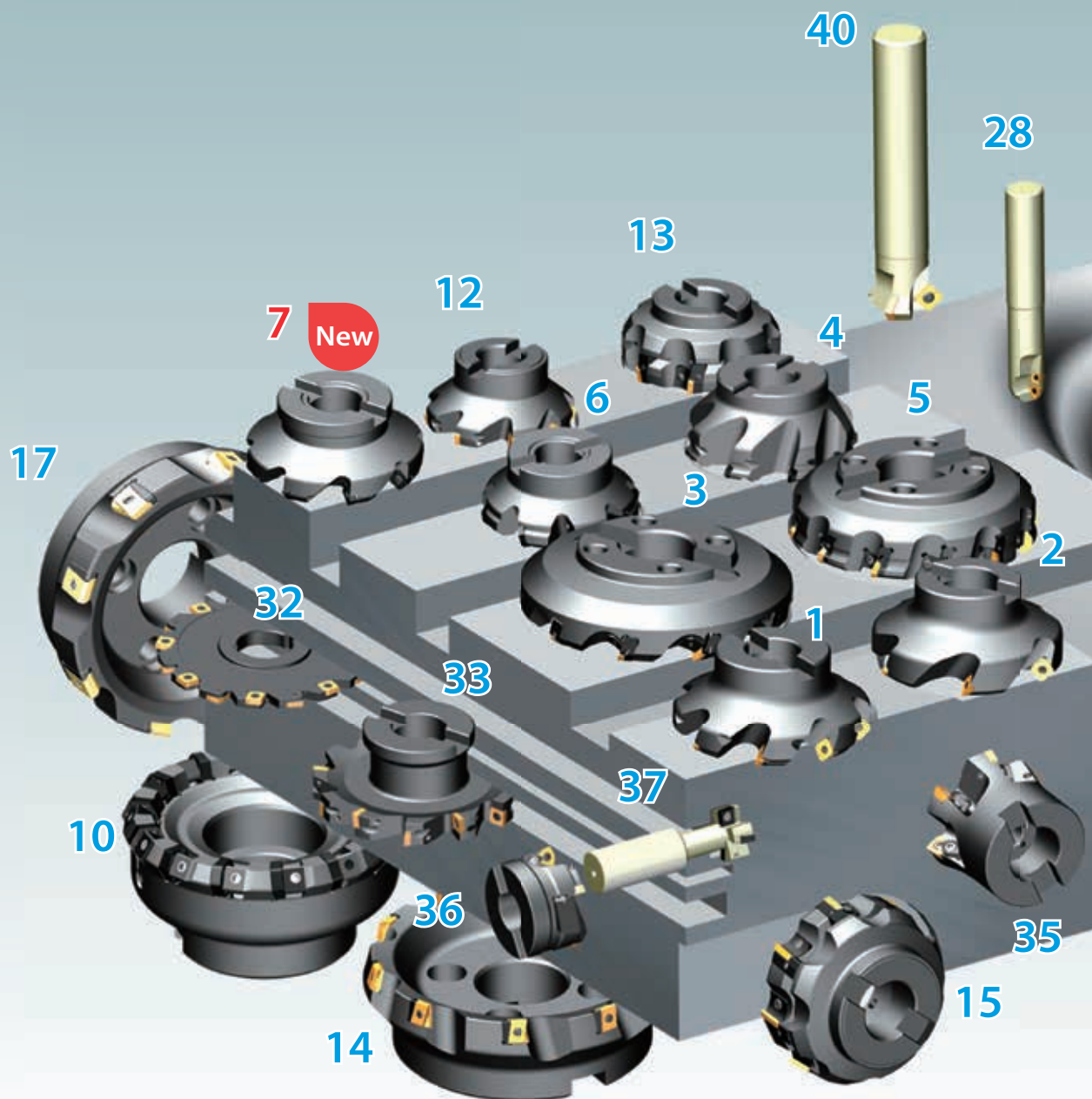
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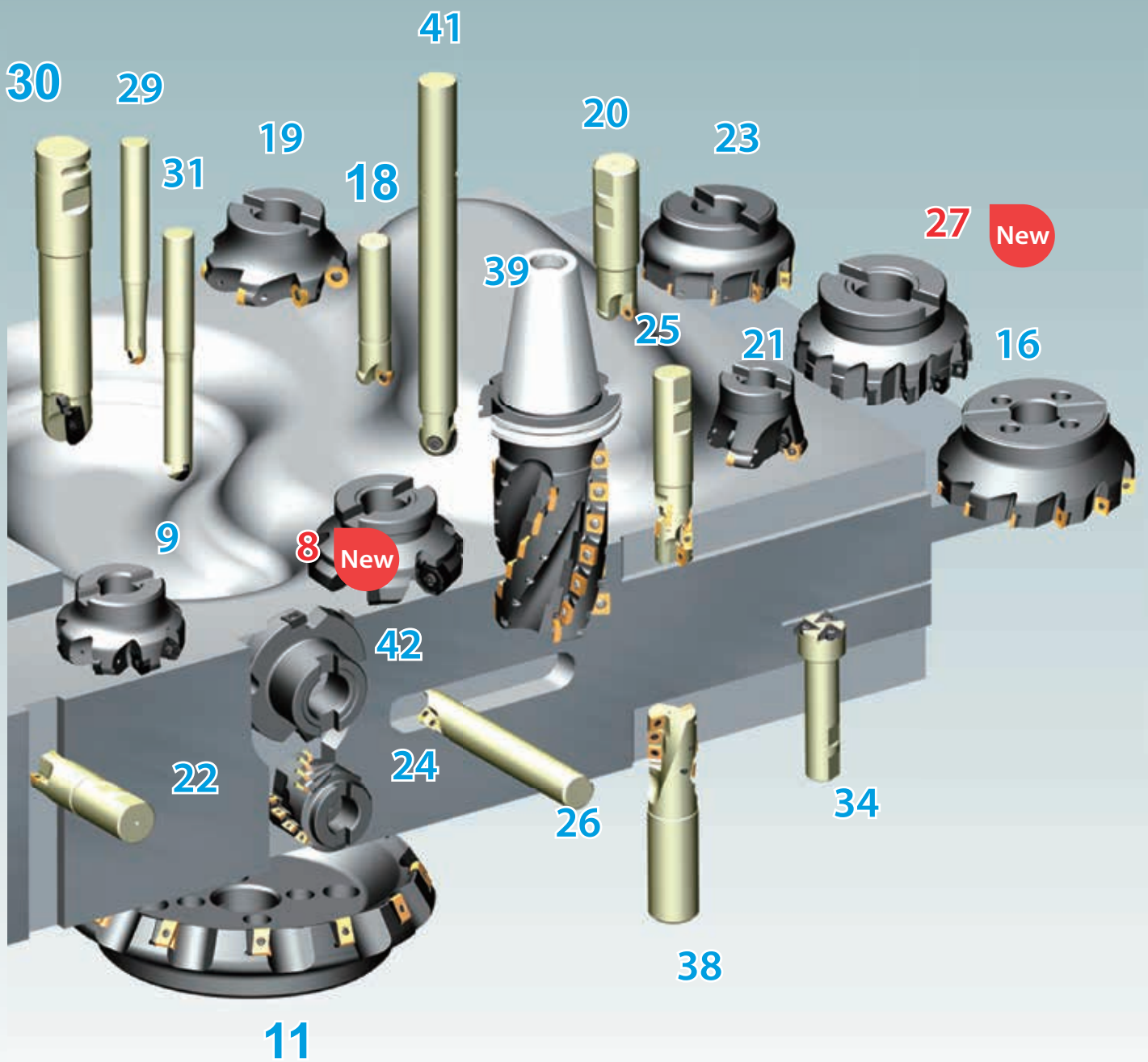
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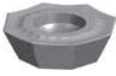



















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FMA01		 SEET12T3 SEET18T6	45°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> • Diameter range Ø50 – 315 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • Milling cutter with positive, soft cutting geometry • Wiper inserts for good surface quality 	B27
FMA02		 SEET12T3	45°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> • Diameter range Ø50 – 125 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • Milling cutter with positive, soft cutting geometry • Wide pitch 	B30
FMA03		 SEEN1203 SEKN1203 SEKR1203 SEKR1504 SEKN1504	45°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø80 – 315 mm • For steel, stainless steel and cast iron • Milling cutter with positive, soft cutting geometry • Wedge clamping 	B33
FMA04		 OFKT05T3	45°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø50 – 160 mm • For steel, stainless steel, cast iron and non-ferrous metals • Inserts with eight cutting edges • Screw clamping 	B36
FMA04		 OFKR0704	45°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø125 – 315 mm • For steel, stainless steel, cast iron and non-ferrous metals • Inserts with eight cutting edges • Wedge clamping 	B38
FMA07		 ONHU0604 ONHU08T5	45°	✓		✓			✓	<ul style="list-style-type: none"> • Diameter range Ø25 – 50 mm • For steel and cast iron • Inserts with 16 cutting edges 	B42
FMA07		 ONHU0604 ONHU08T5	45°	✓		✓			✓	<ul style="list-style-type: none"> • Diameter range Ø40 – 315 mm • For steel and cast iron • Inserts with 16 cutting edges 	B44
FMA11		 SNEG1205 SNEG1506 SNEG1907	45°	✓	✓	✓			✓	<ul style="list-style-type: none"> • Diameter range Ø63 – 315 mm • For steel, stainless steel and cast iron • Inserts with eight cutting edges • Double sided, thicker inserts for high stability and deeper cutting depths • Wiper geometry for good surface quality • Normal and fine pitch 	B48

✓ Very suitable ✓ Suitable

	Series	Milling body	Inserts	Kr	Application						Features	Page
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Planfräser	FMA12		 ONHU08T6	45°	✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø63 – 315 mm For steel, stainless steel and cast iron Inserts with 16 cutting edges 	B52
	FMD02		 PNEG1105	67°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø50 – 315 mm For steel, stainless steel and cast iron Inserts with ten cutting edges Wedge clamping or screw clamping Normal and fine pitch 	B56 - 61
	FMD02		 HNEX0905	55°			✓				<ul style="list-style-type: none"> Diameter range Ø80 – 315 mm For cast iron Wedge clamping Inserts with twelve cutting edges 	B62
	FMD03		 LNKT2007DN-ZR LNKT2510-ZR	60°	✓		✓				<ul style="list-style-type: none"> Diameter range Ø100 – 400 mm For steel and cast iron Tangential insert with four cutting edges Heavy duty machining for high cutting depths Screw clamping 	B64
	FME02		 SPKW1204 SPKT1204	75°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø50 – 125 mm For steel, stainless steel and cast iron Screw clamping 	B66
	FME03		 SPKN1203 SPKR1203 SPEX1203 SPKN1504 SPKR1504 SPEX1504	75°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø80 – 400 mm For steel, stainless steel and cast iron Wedge clamping 	B68
	FME04		 LNKT1506	75°	✓		✓				<ul style="list-style-type: none"> Diameter range Ø125 – 315 mm For steel and cast iron Tangential insert with four cutting edges Heavy duty machining for high cutting depths Screw clamping 	B72
	FMP01		 TPKN2204	90°	✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø80 – 315 mm For steel, stainless steel and cast iron Milling cutter with positive, soft cutting geometry Wedge clamping 	B74

✓ Very suitable ✓ Suitable

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FMP02		 SEET09T3 SEET1203	90°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> Diameter range Ø22 – 60 mm For steel, stainless steel, cast iron and non-ferrous metals Screw clamping 	B76
FMP03		 LNKT120608-ZR LNKT1506EN-ZR LNKT2007DN-ZR LNKT2510-ZR	89°	✓		✓				<ul style="list-style-type: none"> Diameter range Ø50 – 315 mm For steel and cast iron Tangential insert with four cutting edges Heavy duty machining for high cutting depths Screw clamping 	B79
FMR01		 RCKT10T3 RCKT1204 RCGX1204		✓	✓	✓	✓	✓		<ul style="list-style-type: none"> Diameter range Ø25 – 63 mm For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys Screw clamping 	B81
FMR02		 RCKT1204 RCMW1204 RCKT1606 RCKT2006 RCGX1204		✓	✓	✓	✓	✓		<ul style="list-style-type: none"> Diameter range Ø50 – 250 mm For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys Screw clamping 	B83
FMR03		 RDKW0803 RDKW10T3 RDKW1204		✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø15 – 50 mm For steel, stainless steel and cast iron Screw clamping Mould and die industry 	B86
FMR03		 RDKW0702 RDKW1003		✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø15 – 50 mm For steel, stainless steel and cast iron Screw clamping Mould and die industry 	B88
FMR04		 RDKW1204 RDKW1605 RDKW2006		✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø50 – 200 mm For steel, stainless steel and cast iron Screw clamping Mould and die industry 	B90
FMR04		 RDKW1003 RDKW12T3 RDKW1604		✓	✓	✓			✓	<ul style="list-style-type: none"> Diameter range Ø42 – 200 mm For steel, stainless steel and cast iron Screw clamping Mould and die industry 	B92

✓ Very suitable ✓ Suitable

	Series	Milling body	Inserts	Kr	Application						Features	Page
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Square shoulder milling	EMP01		 APKT11T3 APKT1604	90°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> • Diameter range Ø12 – 63 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • Weldon shank • For square shoulder milling, slot milling and ramping • Milling cutter with positive, soft cutting geometry • Inserts with two cutting edges 	B94-99
	EMP02		 APKT11T3 APKT1604	90°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> • Diameter range Ø12 – 63 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • Weldon shank • For square shoulder milling, slot milling and ramping • Milling cutter with positive, soft cutting geometry • Inserts with two cutting edges 	B100
	EMP03		 APKT11T3	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø50 – 100 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • For square shoulder milling, slot milling and ramping • Milling cutter with a positive, soft cutting geometry • Inserts with two cutting edges 	B103
	EMP04		 APKT11T3	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø20 – 40 mm • For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys • For square shoulder milling, slot milling and ramping • Milling cutter with positive, soft cutting geometry • Inserts with two cutting edges 	B105
	EMP05		 APMT1135 APMT1604	90°	✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø25 – 40 mm • For steel, stainless steel and cast iron • Straight shank • For square shoulder milling, slot milling and ramping • Milling cutter with positive, soft cutting geometry • Inserts with two cutting edges • Machining in z-direction possible 	B107
	EMP09		 LNKT120608PNR-GM	90°	✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø40 – 125 mm • Sharp cutting edge geometry combined with robust tangential inserts • First choice for large cutting depths with high feed rates. • Specially designed cutting edge with high precision control for high quality 90 degree square shoulder milling 	B110
	EMP13		 ANGX1105 ANGX1506	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø40 – 250 mm • For steel, cast iron and non-ferrous metals • Double sided, thicker inserts for high stability and deeper cutting depths • Inserts with four cutting edges 	B116

✓ Very suitable ✓ Suitable

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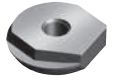
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Square shoulder milling	EMP13		 ANGX1105 ANGX1506	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø25 – 40 mm • For steel, cast iron and non-ferrous metals • Double sided, thicker inserts for high stability and deeper cutting depths • Inserts with four cutting edges 	B118
	EMP13		 ANGX1105 ANGX1506	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø50 – 80 mm • For steel, cast iron and non-ferrous metals • Double sided, thicker inserts for high stability and deeper cutting depths • Inserts with four cutting edges 	B122
	EMP13		 ANGX1105 ANGX1506	90°	✓	✓	✓	✓			<ul style="list-style-type: none"> • Diameter range Ø32 – 50 mm • For steel, cast iron and non-ferrous metals • Double sided, thicker inserts for high stability and deeper cutting depths • Inserts with four cutting edges 	B124
Profile milling	BMR01		 ZDET08T2 ZDET1103 ZDET11T3 ZPNT2204 SPMT0603 SPMT0903 SPMT1204		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø20 – 63 mm • For steel, stainless steel and cast iron • Very suitable for roughing of big moulds • Inserts with three cutting edges 	B126
	BMR02		 ROHX1203 ROHX1604 ROHX2005		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø12 – 20 mm • For steel, stainless steel and cast iron • Very suitable for finishing in mould and die industry • Inserts with two cutting edges 	B129
	BMR03		 XPHT16 XPHT20 XPHT25 XPHT30 XPHT32 XPHT40 XPHT50		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø16 – 40 mm • For steel and cast iron • Very suitable for roughing in mould and die industry • Tool with high stability 	B131-138
	BMR04		 ZOHX1203 ZOHX1604 ZOHX2005 ZOHX2506 ZOHX3007 ZOHX3207		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø12 – 32 mm • For steel, stainless steel and cast iron • Very suitable for finishing in mould and die industry • Inserts with two cutting edges 	B139-142

✓ Very suitable ✓ Suitable

	Series	Milling body	Inserts	Kr	Application							Features	Page
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Slot milling	SMP01		 XSEQ1202 XSEQ1203 XSEQ12T3 XSEQ1204 XSEQ12T4	90°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø100 – 250 mm • For steel, stainless steel and cast iron • Bore with keyway • Groove widths 4, 5, 6, 7, 8 mm 	B143
	SMP01		 XSEQ1202 XSEQ1203 XSEQ12T3 XSEQ1204 XSEQ12T4	90°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø63 – 160 mm • For steel, stainless steel and cast iron • Groove widths 4, 5, 6, 7, 8 mm 	B145
	SMP03		 MPHT0603 MPHT0803 MPHT1204	90°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø80 – 200 mm • For steel, stainless steel and cast iron • Bore with keyway • Groove widths 8, 10, 12, 16, 18, 20 mm 	B147
	SMP03		 MPHT0603 MPHT0803 MPHT1204	90°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø80 – 200 mm • For steel, stainless steel and cast iron • Groove widths 8, 10, 12, 16, 18, 20 mm 	B149
	SMP05		 QC16L QC22L	90°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø25 – 44 mm • For steel, stainless steel and cast iron • Groove widths range 1,1 – 4,8 mm 	B151
High feed milling	XMR01		 SDMT06T2 SDMT09T3 SDMT1204 SDMT1505	15°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø20 – 40 mm • For steel, stainless steel and cast iron • Inserts with four cutting edges • Ramping possible • Double clamping system for inserts 	B156
	XMR01		 SDMT06T2 SDMT09T3 SDMT1204 SDMT1505	15°	✓	✓	✓					<ul style="list-style-type: none"> • Diameter range Ø40 – 125 mm • For steel, stainless steel and cast iron • Inserts with four cutting edges • Ramping possible • Double clamping system for inserts 	B158

✓ Very suitable ✓ Suitable

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High feed milling	XMR01		 WPGT0503 WPGT0604 WPGT0806	11° - 22°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø20 – 40 mm For steel, stainless steel and cast iron Inserts with three cutting edges Ramping possible Double clamping system for inserts 	B160
	XMR01		 WPGT0503 WPGT0604 WPGT0806 WPGT0907	11° - 22°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø42 – 160 mm For steel, stainless steel and cast iron Inserts with three cutting edges Ramping possible Double clamping system for inserts 	B162
Bore milling	XMP01		 CNE12	90°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø80 – 400 mm For steel, stainless steel and cast iron Also for face and square shoulder milling 	B164
T-slot milling	TMP01		 MPHT0603 MPHT0803 MPHT1204	90°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø21 – 60 mm For cast iron Groove widths 9, 11, 14, 18, 22, 28 mm 	B166
Helical milling	HMP01		 APKT1504 SPMT1204	90°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø40 – 50 mm For steel and cast iron Weldon shank 	B168
	HMP01		 APKT1504 SPMT1204	90°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø50 – 80 mm For steel and cast iron With JT coupling 	B170
	HMP01 EC		 APKT1504 SPMT1204	90°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø50 – 80 mm For steel and cast iron With JT coupling With indexable head 	B172

✓ Very suitable ✓ Suitable

	Series	Milling body	Inserts	Kr	Application						Features	Page
					P	M	K	N	S	H		
Chamfer milling	CMZ01		 SPMT1204	30°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø12 – 32 mm For steel, stainless steel and cast iron Chamfer milling cutter 30° 	B174 -177
	CMA01		 SPMT1204	45°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø12 – 32 mm For steel, stainless steel and cast iron Chamfer milling cutter 45° Weldon shank 	B178 -181
	CMD01		 SPMT1204	60°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø12 – 32 mm For steel, stainless steel and cast iron Chamfer milling cutter 60° Weldon shank 	B182
Indexable heads – QCH series	QCH-XPHT		 XPHT16 XPHT20 XPHT25 XPHT30 XPHT32		✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø16 – 32 mm For steel and cast iron Very suitable for roughing in mould and die industry 	B188
	QCH-SDMT		 SDMT06T2 SDMT09T3 SDMT1204 SDMT1505	15°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø20 – 40 mm For steel, stainless steel and cast iron Inserts with four cutting edges Ramping possible Double clamping system for inserts 	B190
	QCH-WPGT		 WPGT0503 WPGT0604 WPGT0806 WPGT0907	11° - 22°	✓	✓	✓				<ul style="list-style-type: none"> Diameter range Ø16 – 42 mm For steel, stainless steel and cast iron Inserts with three cutting edges Ramping possible Double clamping system for inserts 	B192
	QCH-APKT		 APKT11T3 APKT1604	90°	✓	✓	✓	✓	✓		<ul style="list-style-type: none"> Diameter range Ø16 – 40 mm For steel, stainless steel, cast iron, non-ferrous metals and heat-resistant alloys For square shoulder milling, slot milling and ramping Milling cutter with positive, soft cutting geometry Inserts with two cutting edges 	B194

✓ Very suitable ✓ Suitable

A

Turning

B

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C

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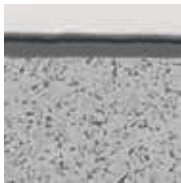

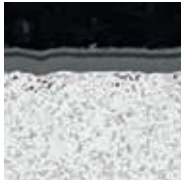





	Series	Milling body	Inserts	Kr	Application						Features	Page
					P	M	K	N	S	H		
Indexable heads – QCH series	QCH-RD		 RDKW0702 RDKW1003 RDKW10T3 RDKW12T3 RDKW1204 RDKW1604 RDKW1605		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø15 – 42 mm • For steel, stainless steel and cast iron • Screw clamping • Mould and die industry • For two different thicknesses of inserts 	B197
	QCH-ZOHX		 ZOHX1604 ZOHX2005 ZOHX2506 ZOHX3007 ZOHX3207		✓	✓	✓				<ul style="list-style-type: none"> • Diameter range Ø16 – 32 mm • For steel, stainless steel and cast iron • Very suitable for finishing in mould and die industry • Inserts with two cutting edges 	B201

✓ Very suitable ✓ Suitable

Chip breakers overview

	Finishing	Medium machining	Roughing
A Turning	DF	DM	DR
	APF	APM	-
	PF	PM	PR
	GF	GM	GR
	-	-	ZR
	MO-2	MO-1	MO-3
B Milling	EF	EM	-
	APF	APM	-
	DF	DM	-
	PF	PM	PR
	GF	GM	GR
	E	E	-
C Drilling	-	-	ZR
	CF	CM	CR
	DF	DM	DR
	EDFR	DER	DER
	PF	PM	PR
	GF	GM	GR
D Technical Information	-	-	ZR
	MO-2	MO-1	MO-3
	EF	EM	-
E Index	NM	NM	-
	LH	LH	LH
	ALH	ALH	ALH

Coated cemented carbide CVD

Grade	ISO	Micro structure	Grade description
YBC301	P20–P35		CVD coated P20–P35 carbide grade for medium operation to roughing of steel at lower cutting speed.
YBC302	P20–P35		CVD coated P20–P35 carbide grade for medium operation to roughing of steel at higher cutting speed. Optimal performance of wear resistance and toughness for a wide application field.
YBC401	P30–P50 M30–M40		CVD coated P30–P50/M30–M40 carbide grade for roughing operation of steel at lower cutting speed and unstable condition.
YBM251	P20–P30 M15–M35		CVD coated P20–P30/M15–M35 carbide grade for medium to roughing operation in stainless steel and steel with wide application field. Good wear resistance and capability against plastic deformation at normal cutting speed.
YBM253	M15–M35		CVD coated M15–M35 carbide grade for medium to roughing operation in stainless steel with wide application field. High wear resistance and capability against plastic deformation at higher cutting speed.
YBM351	P25–P40 M25–M40		CVD coated P25–P40/M25–M40 carbide grade for roughing operation in stainless steel and steel. Good wear resistance and edge stability at normal cutting speed.
YBD152	K10–K25		CVD coated K10–K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Good wear resistance and toughness at higher cutting speed.
YBD252	K20–K35		CVD coated K20–K35 carbide substrate. Optimized for medium to roughing operation of cast iron and Steel. Good wear resistance and toughness at higher cutting speed.

A

Turning

B

Milling





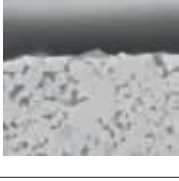
C

Drilling

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Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
YBG102	S05–S15		PVD coated S05–S15 carbide substrate for finishing to medium application of super alloy material, stainless steel and aluminum. Good wear resistance in a wide application field.
YBG202	P10–P30 M10–M25		PVD coated P10–P30/M10–M25 carbide substrate for finishing to medium application of stainless steel and steel (milling). Good wear resistance in a wide application field.
YB9320	P10–P30 M20–M40		PVD multilayer coated P10–P30/M20–M40 carbide substrate for finishing to medium application of stainless steel, super alloy and steel (grooving/milling). Optimized coating stability for higher wear resistance and thermal stability in a wide application field.
YBG205	P10–P30 M20–M40 S15–S25		PVD multilayer coated P10–P30/M20–M40/S15–S25 carbide substrate for finishing to medium application of stainless steel, super alloy and steel (milling). Good wear resistance and thermal stability in a wide application field.
YBG302	P15–P30 M25–M40		PVD coated P15–P30/M25–M40 carbide substrate for medium roughing application of stainless steel and steel (milling). Good wear resistance and toughness.
YBG152	K20–K35	–	PVD coated K20–K35 carbide substrate for medium roughing application of cast iron. Good wear resistance and toughness.
YBG252	P10–P20 M10–M20 K10–K20	–	PVD coated P10–P20/M10–M20/K10–K20 carbide grade for finishing to medium operation of steel, stainless steel and cast iron. Good wear resistance and toughness for a wide application field.

A

Turning

B

Milling

C

Drilling

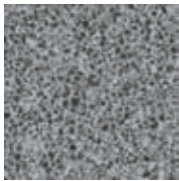
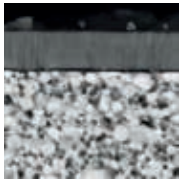
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Technical Information

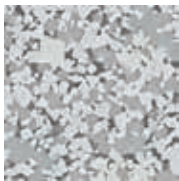
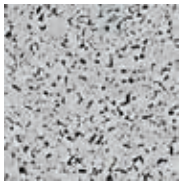
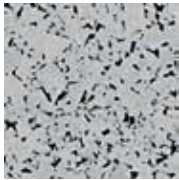
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Cermet

Grade	ISO	Micro structure	Grade description
YNG151	P05–P15		Uncoated P05–P15 cermet grade for fine finishing operation of steel and stainless steel. Good resistance against plastic deformation for good surface finishing.
YNG151C	P05–P15		PVD coated P05–P15 cermet grade for fine finishing operation of steel and stainless steel. Good wear resistance and capability against plastic deformation for good surface roughness.

Uncoated cemented carbide

Grade	ISO	Micro structure	Grade description
YC30S	P25–P40 M25–M40		Uncoated P25–P40/M25–M40 carbide substrate for roughing operation of steel and stainless steel.
YD101	K05–K20 N05–N20		Uncoated K05–K20/N05–N20 carbide substrate for fine to medium application in aluminum and other material.
YD201	K10–K30 N10–N30		Uncoated K10–K30/N10–N30 carbide substrate for medium application in aluminum and other material.

A

Turning

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Milling

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Drilling

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Application fields of grades – Indexable milling

	ISO	HC ¹ (CVD)	HC ¹ (PVD)	HT	HC ²	HW	PCBN/PCD
P	P01		YBG102		YNG151C		
	P10		YBG202	YNG151			
	P20	YBC301	YBG205				
	P30	YBC401	YBG252				
	P40	YBM351	YBG302			YC305	
		YBM253	YB9320				
M	M01		YBG102		YNG151C		
	M10	YBM251	YBG202	YNG151			
	M20	YBM253	YBG205				
	M30	YBM351	YBG252				
	M40	YBC401	YBG302			YC305	
			YB9320				
K	K01		YBG102				
	K10	YBD152	YBG152				
	K20	YBD252	YBG202				YD201
	K30		YBG252				
	K40						
N	N01					YD051	
	N10		YBG101			YD101	
	N20		YBG202				YD201
	N30						
S	S01		YBG102				
	S10		YBG202				
	S20		YBG205				
	S30						
H	H01		YBG102				
	H10						
	H20						
	H30						

P	Steel
M	Stainless steel
K	Cast iron

N	Non-ferrous metals
S	Heat-resistant alloys
H	Hardened materials

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



New **EMP13**



FM E 03 100 – B32 S – P 12 – 06 (L) (C)

1 2 3 4 5 6 7 8 9 10 11

Type		Entering angle		Serial no.	Nominal diameter [mm]	
Code	Description				Code	Description
BM	Profile milling	A	45°		025	25
CM	Chamfer milling	E	75°		050	50
EM	Square shoulder milling	D	60°		160	160
FM	Face milling	P	90°		315	315
HM	Helical milling	R			...	
SM	Slot milling					
TM	T-slot milling					
XM	Special					

1

2

3

4

Type and size of tool holders			
Code	Type	Code	Type
A	<p>Nominal diameter Ø50 – 80 mm</p>	B	<p>Nominal diameter Ø100 – 160 mm</p>
C	<p>Nominal diameter Ø200 – 250 mm</p>	D	<p>Nominal diameter Ø315 mm</p>
G	Straight shank	XP	Weldon shank
K	Bore with keyway		

5

With respect to mounting please adhere to the information provided by the tool holder manufacturer.

Insert shape	
A	C
H	L
M	O
P	R
S	T
W	X Special
Z	Special

6

Clearance angle	
B	C
D	E
F	N
P	

7

Cutting edge length l [mm]	
Insert shape	
A	C, M
H, O, P	L
R	S
T	W

8

No. of teeth

9

Cutting direction	
Code	Description
L	Left

10

With inner cooling

11



Tools with B coupling and inner coolant supply require the following spare parts:



Coolant clamp screw



Coolant shower plate



Spare parts (B coupling with inner coolant supply)

		B27	B32	B40	B40
	∅	80	100	125	160
	Coolant clamp screw	LDB27C	LDB32C	LDB40C	LDB40C
	Coolant shower plate	B27-002-CP	B32-002-CP	B40-002-CP	B40-003-CP

When purchasing tools with inner coolant supply and B coupling these spare parts are included in delivery.

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S P K N 12 04 ED T21K R – DM

1 2 3 4 5 6 7 8 9 10

Insert shape	
A	C
H	L
M	O
P	R
S	T
W	X Special
Z	Special

Clearance angle	
B	C
D	E
F	N
P	

Tolerance class			
Code	I.C [mm]	m [mm]	S [mm]
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
E	±0.025	±0.025	±0.025
F	±0.013	±0.005	±0.025
G	±0.025	±0.025	±0.130
H	±0.013	±0.013	±0.025
J	±0.05–0.13	±0.005	±0.025
K	±0.05–0.13	±0.013	±0.025
L	±0.05–0.13	±0.025	±0.025
M	±0.05–0.13	±0.08–0.18	±0.130
N	±0.05–0.13	±0.08–0.18	±0.025
U	±0.08–0.25	±0.13–0.38	±0.130

1

2

3

Fastening features (metric)	
Insert shape	
A	B
C	F
G	H
J	M
N	Q
R	T
U	W
X	Special

Cutting edge length l [mm]	
Insert shape	
A	C, M
H, O, P	L
R	S
T	W

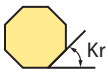

Insert thickness S [mm]			
Code	S	Code	S
00	0.79	05	5.56
T0	0.99	T5	5.95
01	1.59	06	6.35
T1	1.98	T6	6.75
02	2.38	07	7.94
T2	2.58	09	9.52
03	3.18	T9	9.72
T3	3.97	11	11.11
04	4.76	12	12.70
T4	4.96		

4








5

6

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 B Milling
 C Drilling
 D Technical Information
 E Index

Angle			
			
Code	Kr	Code	an
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Special	F	25°
		G	30°
		N	0°
		P	11°
		Z	Special

7

Chamfer							
Code	Type	Code	Angle	Code	Width [mm]	Code	Position
F		0	5°	0	0.10	K	
E		1	10°	1	0.15		
T		2	15°	2	0.20		
S		3	20°	3	0.25		
		4	25°	4	0.30		
		5	30°	5	0.35		
				6	0.40	W	
				7	0.45		
						-	

8

Cutting direction	
Code	Description
R	Right
L	Left
N	Right and left

9

Chip breaker overview
(on page B16)

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Turning

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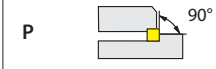
Index

SM P 03 – 160 × 16 – K 40 – M P 12 – 12 L

1 2 3 4 5 6 7 8 9 10 11 12

A

Turning

Type		Entering angle		Serial no.	Nominal diameter [mm]	Cutting width [mm]
Code	Description					
SM	Slot milling cutter					
1		2		3	4	5


B

Milling

Tool holder type				Diameter of mounting hole [mm]	Insert shape	
Code	Description	Code	Description		M	S
A	A type	B	B type			
C	C type	D	D type			
K	With feather key					
6				7	8	

C

Drilling

Clearance angle		Insert size [mm]	No. of teeth	Cutting direction	
N	P			Code	Description
				R	Right
				L	Left
9		10	11	12	

D

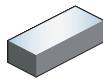
Technical Information

E

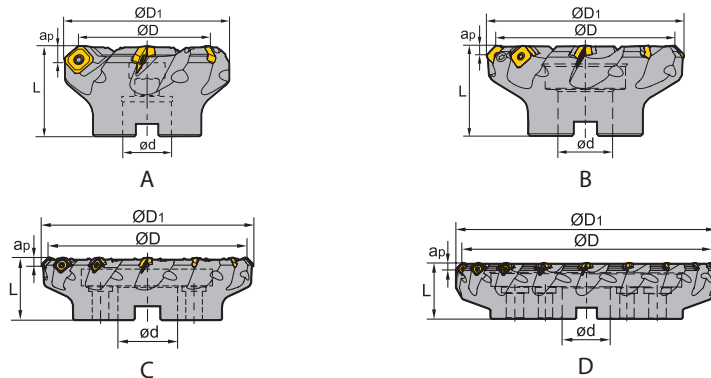
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Face milling

FMA01 Kr: 45°



Fine pitch



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts	
		R	L	ØD	ØD ₁	ød	L	a _{p max}					
FMA01-050-A22-SE12-04		●	○	50	61	22	40	6	4	A	0.3	SEET12T3	
FMA01-050-A22-SE12-04C	*	●	○	50	61	22	40	6	4	A	0.3		
FMA01-063-A22-SE12-05		●	○	63	74	22	40	6	5	A	0.5		
FMA01-063-A22-SE12-05C	*	●	○	63	74	22	40	6	6	A	1.2		
FMA01-080-A27-SE12-06		●	●	80	91	27	50	6	6	A	1.2		
FMA01-080-A27-SE12-06C	*	●	●	80	91	27	50	6	6	A	1.2		
FMA01-100-B32-SE12-07		●	●	100	107	32	50	6	7	B	1.2		
FMA01-100-B32-SE12-07C	*	●	○	100	107	32	50	6	7	B	1.2		
FMA01-125-B40-SE12-08		●	●	125	136	40	63	6	8	B	2.6		
FMA01-125-B40-SE12-08C	*	●	○	125	136	40	63	6	8	B	2.6		
FMA01-160-B40-SE12-10		●	●	160	170	40	63	6	10	B	4.3		
FMA01-160-B40-SE12-10C	*	○	○	160	170	40	63	6	10	B	4.3		
FMA01-200-C60-SE12-12		●	○	200	210	60	63	6	12	C	7.6		
FMA01-250-C60-SE12-14		●	○	250	260	60	63	6	14	C	13.5		
FMA01-315-D60-SE12-18		●	○	315	325	60	70	6	18	D	20.8		
<hr/>													
FMA01-100-B32-SE18-04		○	○	100	120	32	63	10	4	B	1.2		SEET18T6
FMA01-125-B40-SE18-05		○	○	125	145	40	63	10	5	B	2.6		
FMA01-160-C40-SE18-06		○	○	160	180	40	63	10	6	C	4.3		
FMA01-200-C60-SE18-08		●	○	200	220	60	63	10	8	C	7.6		
FMA01-250-C60-SE18-10		●	○	250	270	60	63	10	10	C	13.5		
FMA01-315-D60-SE18-12		○	○	315	335	60	80	10	12	D	20.8		

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

B

Milling

C

Drilling

D

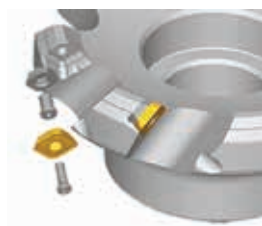
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Spare parts

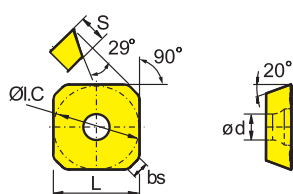
Insert	SEET12T3 ØD	SEET12T3 50-100	SEET12T3 125 - 315	SEET18T6 100- 315
Screw (insert)		I60M3.5*10	I60M3.5*12	I60M5*17
Screw (shim)			SM5*7XA	SM8*9XA
Shim			S13BS	S18BS
Wrench (insert)		WT15IS	WT15IS	
Wrench (insert)				WT20IT
Wrench (shim)			WH35L	WH50L



Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SEET	L	I.C	S	d
12 T3	13.4	13.4	3.97	4.1
18 T6	18	18	6.1	5.5



SE** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
		P	M	K	N	S	H																	
	ISO	bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SEET12T3-CF	2.55							●		●													
	SEET12T3-CM	2.55							●		●													
	SEET12T3-CR	2.55							●	●	○	○												
	SEET12T3-DF	2.55	●	●		●	●						●	●				○	○					
	SEET12T3-DM	2.55	●	●	●	●	●					●	●	●										
	SEET18T6-DM	2.29	●		●																			
	SEET12T3-DR	2.55	●	●		●	●						○	○										

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide




System code > B22

Grade selection > B20

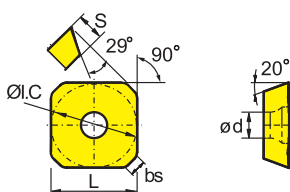



Technical info > B447

Cutting data > B216

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions




SEET	L	I.C	S	d
12 T3	13.4	13.4	3.97	4.1
18 T6	18	18	6.1	5.5

SE** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO		bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SEET12T3-EF	2.55													●		●							
	SEET12T3-EM	2.55					●	●							●		●							
	SEET12T3-LH	2.55											●										●	●

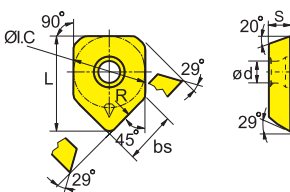

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SEET	L	I.C	S	d
12 T3	17.82	13.4	3.97	4.1

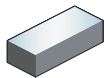
SE** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO		R	bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SEET12T3-W	500	9.46					○	○							●						○		

● Ex stock ○ On demand

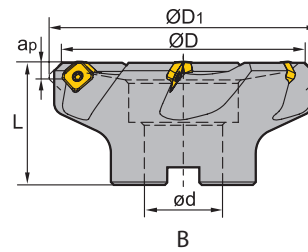
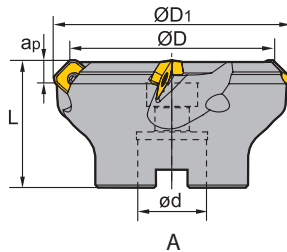
HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Face milling

FMA02 Kr: 45°



Coarse and differential pitch



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA02-050-A22-SE12-03		●	○	50	61	22	40	6	3	A	0.4	SEET12T3
FMA02-050-A22-SE12-03C	*	○	○	50	61	22	40	6	3	A	0.4	
FMA02-063-A22-SE12-04		●	○	63	74	22	40	6	4	A	0.6	
FMA02-063-A22-SE12-04C	*	○	○	63	74	22	40	6	4	A	0.6	
FMA02-080-A27-SE12-04		●	○	80	91	27	50	6	4	A	1.3	
FMA02-080-A27-SE12-04C	*	○	○	80	91	27	50	6	4	A	1.3	
FMA02-100-B32-SE12-05		●	○	100	107	32	50	6	5	B	1.3	
FMA02-100-B32-SE12-05C	*	○	○	100	107	32	50	6	5	B	1.3	
FMA02-125-B40-SE12-06		○	○	125	131	40	63	6	6	B	2.6	
FMA02-125-B40-SE12-06C	*	○	○	125	131	40	63	6	6	B	2.6	

● Ex stock ○ On demand

* With internal cooling




Spare parts			
	Insert	SEET12T3	
	ØD	50-125	
	Screw (insert)	I60M3.5*10	
	Wrench (insert)	WT15IS	

System code > B22

Grade selection > B20

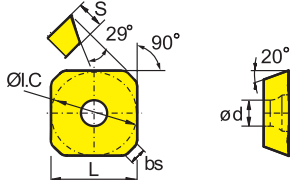









Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SEET	L	I.C	S	d
12 T3	13.4	13.4	3.97	4.1

Milling inserts

SE** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW						
			P	M	K	N	S	H	P	M	K	N	S	H									
ISO		bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SEET12T3-CF	2.55							●		●												
	SEET12T3-CM	2.55							●		●												
	SEET12T3-CR	2.55							●	●		○	○										
	SEET12T3-DF	2.55	●	●		●	●						●	●		○	○						
	SEET12T3-DM	2.55	●	●	●	●	●					●	●	●									
	SEET12T3-DR	2.55	●	●		●	●						○	○									
	SEET12T3-EF	2.55											●	●									
	SEET12T3-EM	2.55				●	●						●	●									
	SEET12T3-LH	2.55									●											●	●

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Drilling

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Technical Information

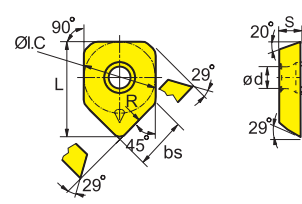

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SEET	L	I.C	S	d
12 T3	17.82	13.4	3.97	4.1

Milling inserts

SE** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
	P	M	K	N	S	H																		
	ISO	R	bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
		SEET12T3-W	500	9.46						○						●						○		

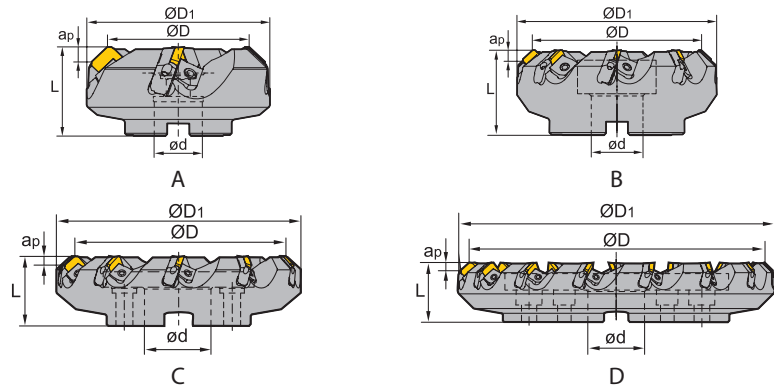
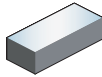
● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



Face milling

FMA03 Kr: 45°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA03-080-A27-SE12-04		○	○	80	103	27	50	5.5	4	A	1.8	SEEN1203 SEKN1203 SEKR1203
FMA03-100-B32-SE12-05		○	○	100	122	32	50	5.5	5	B	2.4	
FMA03-125-B40-SE12-06		○	○	125	147	40	63	5.5	6	B	4.4	
FMA03-160-B40-SE12-08		○	○	160	181	40	63	5.5	8	B	6.4	
FMA03-200-C60-SE12-10		○	○	200	221	60	63	5.5	10	C	8.5	
FMA03-250-C60-SE12-12		○	○	250	270	60	63	5.5	12	C	14.1	
FMA03-315-D60-SE12-15		○	○	315	353	60	63	5.5	15	D	22.2	SEKN1504 SEKR1504
FMA03-080-A27-SE15-04		○	○	80	103	27	50	7.5	4	A	1.7	
FMA03-100-B32-SE15-05		○	○	100	122	32	50	7.5	5	B	2.3	
FMA03-125-B40-SE15-06		○	○	125	147	40	63	7.5	6	B	4.2	
FMA03-160-B40-SE15-08		○	○	160	181	40	63	7.5	8	B	6.1	
FMA03-200-C60-SE15-10		○	○	200	221	60	63	7.5	10	C	8.3	
FMA03-250-C60-SE15-12		○	○	250	270	60	63	7.5	12	C	13.6	
FMA03-315-D60-SE15-15		○	○	315	353	60	63	7.5	15	D	21.8	

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



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Spare parts

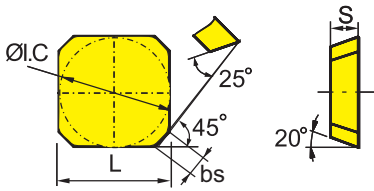





























































































































































Insert	SEEN1203 SEKN1203 SEKR1203	SEKN1504 SEKR1504
	ØD 80- 315	
	Adjustable screw LOM5*15.1	LOM5*15.1
	Cassette (left) LSE12L	LSE15L
	Cassette (right) LSE12R	LSE15R
	Screw (wedge) DM8*21X	DM8*21X
	Wedge (left) W01L	W01L
	Wedge (right) W01R	W01R
	Wrench (locator) WT20T	WT20T
	Wrench (wedge) WH40T	WH40T



-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SEEN	L	I.C	S
12 03	12.7	12.7	3.18

Milling inserts

SE** milling insert	P M K N S H	HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW	
															
ISO	bs														
	SEEN1203AFTN														
															
															
															
															
															
															
															
															
															
															

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SEKN	L	I.C	S
12 03	12.7	12.7	3.18
15 04	15.875	15.875	4.76

Milling inserts

SE** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO		bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SEKN1203AFFN	1.8																						
	SEKN1203AFN	1.8	○										●											
	SEKN1203AFS13N	1.8	○																					
	SEKN1203AFTN	1.8	●		●	●	●						○										●	
	SEKN1504AFN	1.6	○																					
	SEKN1504FTN	1.6	●	○			●	●					●											
	SEKN1504AFZN	1.6																						
SEKN1504AZ	1.6	●																						

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SEKR	L	I.C	S
15 04	15.875	15.875	4.76

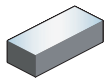
SE** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SEKR1504AFN	1.6	●																				

● Ex stock ○ On demand

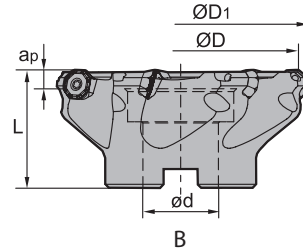
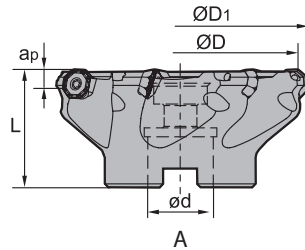
HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Face milling

FMA04 Kr: 45°



Screw Clamping






Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA04-050-A22-OF05-04		●	○	50	56	22	40	3.5	4	A	0.3	OFKT05T3
FMA04-050-A22-OF05-04C	*	○	○	50	56	22	40	3.5	4	A	0.3	
FMA04-050-A22-OF05-05		●	○	50	56	22	40	3.5	5	A	0.4	
FMA04-050-A22-OF05-05C	*	○	○	50	56	22	40	3.5	5	A	0.4	
FMA04-063-A22-OF05-05		●	○	63	69	22	40	3.5	5	A	0.5	
FMA04-063-A22-OF05-05C	*	○	○	63	69	22	40	3.5	5	A	0.5	
FMA04-080-A27-OF05-06		●	○	80	86	27	50	3.5	6	A	0.8	
FMA04-080-A27-OF05-06C	*	●	○	80	86	27	50	3.5	6	A	0.8	
FMA04-100-B32-OF05-07		●	○	100	106	32	50	3.5	7	B	1.2	
FMA04-100-B32-OF05-07C	*	○	○	100	106	32	50	3.5	7	B	1.2	
FMA04-125-B40-OF05-08		●	○	125	130	40	63	3.5	8	B	2.7	
FMA04-125-B40-OF05-08C	*	○	○	125	130	40	63	3.5	8	B	2.7	
FMA04-160-B40-OF05-10		●	○	160	165	40	63	3.5	10	B	5.1	

● Ex stock ○ On demand

* With internal cooling

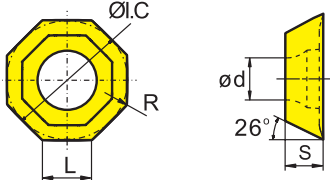



















































Spare parts			
	Insert ØD	OFKT05T3	OFKT05T3
		50-63	80-160
	Screw (insert)	I60M4*8.4	I60M4*10
	Wrench (insert)	WT15IS	WT15IS



-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

OFKT	L	I.C	S	d
05 T3	5.26	12.7	3.97	4.4

Milling inserts

OF** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
ISO		R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	OFKT05T3-DF	0.5																						
	OFKT05T3-DM	0.5																						
	OFKT05T3-LH	0.5																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

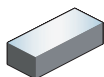
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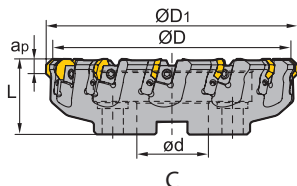
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Face milling

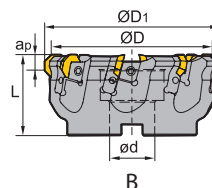
FMA04 Kr: 45°



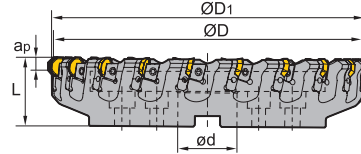
Wedge




C



B











D

Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts 
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA04-125-B40-OF07-08	● ○	125	136	40	63	5	8	B	3.9	OFKR0704		
FMA04-160-B40-OF07-10	● ○	160	171	40	63	5	10	B	5.9			
FMA04-200-C60-OF07-12	● ○	200	211	60	63	5	12	C	7.6			
FMA04-250-C60-OF07-16	● ○	250	261	60	63	5	16	C	13.3			
FMA04-315-D60-OF07-20	○ ○	315	321	60	63	5	20	D	20.3			




● Ex stock ○ On demand

* With internal cooling

Spare parts

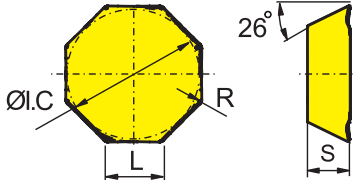
















	Insert	OFKR0704
	ØD	125 - 315
	Adjustable screw	LOM5*15.1
	Cassette (left)	LOF07L
	Cassette (right)	LOF07R
	Screw (wedge)	DM8*21X
	Wedge (left)	W02L
	Wedge (right)	W02R
	Wrench (locator)	WT20T
	Wrench (wedge)	WH40T



-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

OFKR	L	I.C	S
07 04	7.45	17.94	4.76

Milling inserts

OF** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
ISO		R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	OFKR0704-DF	0.8																						
	OFKR0704-DM	0.8																						
	OFKR0704W-DM	0.8																						
	OFKR0704-LH	0.8																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Dotted lines for notes.

FMA07 *Kr: 45°*

Face mill

- High cost-benefit factor due to 16 cutting edges.
- Thick insert for best stability and break resistance.
- Different chip breakers for best chip breaking.
- Two insert sizes available.

Insert grades

YBC302

CVD
P15–P35

YBG202

PVD
P10–P30

YBM253

CVD
P20–P40

YBM351

CVD
P25–P40

YBG205

PVD
P10–P30
M20–M30

YB9320

PVD
P15–P25
M20–M30

YBD152

CVD
K05–K25

Chip breakers

-PF

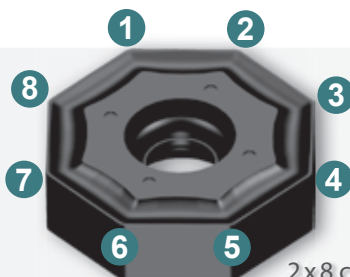


- Low cutting forces
- Very sharp

-PM



- General application
- Good balance between stability and sharpness

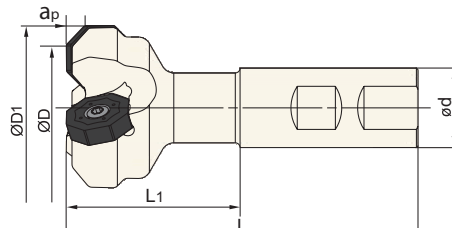
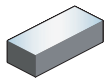


2x8 cutting edges



Face milling

FMA07 Kr: 45°



Weldon-Schaft




Article	*	Stock		Dimensions [mm]						Teeth	kg	Inserts
		R	L	ØD	ØD ₁	ød	L ₁	L	a _{p max}			
FMA07-025-XP20-ON06-02		●	○	25	37	20	45	95	4	2	0.2	ONHU0604
FMA07-025-XP20-ON06-02C	*	●	○	25	37	20	45	95	4	2	0.2	
FMA07-032-XP25-ON06-02C	*	●	○	32	44	25	55	111	4	2	0.4	
FMA07-040-XP25-ON06-03		●	○	40	52	25	50	106	4	3	0.4	ONHU08T5
FMA07-032-XP25-ON08-02		●	○	32	47	25	55	111	5	2	0.4	
FMA07-032-XP25-ON08-02C	*	●	○	32	47	25	55	111	5	2	0.4	
FMA07-040-XP25-ON08-03		●	○	40	55	25	55	111	5	3	0.5	
FMA07-040-XP25-ON08-03C	*	●	○	40	55	25	55	111	5	3	0.5	
FMA07-050-XP25-ON08-04		●	○	50	65	25	55	111	5	4	0.6	

● Ex stock ○ On demand

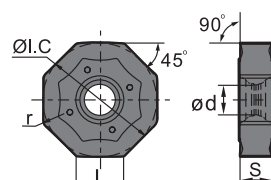


* With internal cooling

Spare parts				
	Insert	ONHU0604	ONHU08T5	
		25-40	32-50	
	Screw (insert)	I60M4*10	I60M5*13	
	Wrench (insert)		WT20IT	
	Wrench (insert)	WT15IS		

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions




ONHU	L	I.C	S	d
06 04	6.58	15.875	4.76	4.4
08 T5	8.37	20.2	5.77	5.3

ON** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
	ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ONHU060408-PF	0.8	●		○			○						●	○									
	ONHU08T508-PF	0.8	●		●			○					●		●									
	ONHU060408-PM	0.8	●		●		●	●						●	○									
	ONHU08T508-PM	0.8	●		●		●	●																

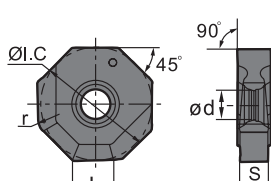

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ONHU	L	I.C	S	d
08 T5	6.9	20.5	6	5.3

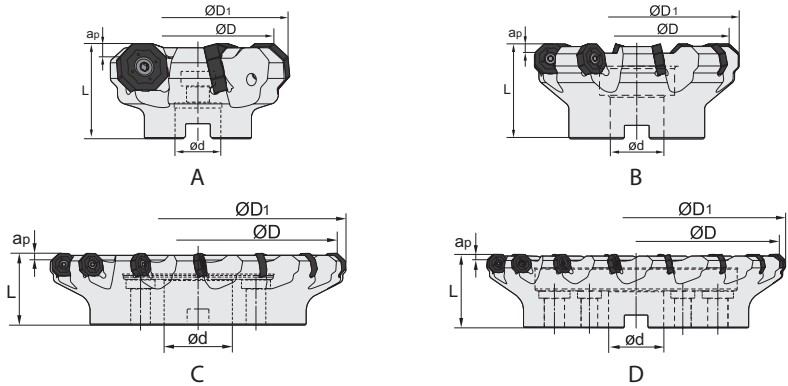
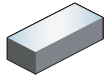
ON** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
	ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ONHU08T508-W	0.8						●			○													

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Face milling

FMA07 Kr: 45°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts	
		R	L	ØD	ØD ₁	ød	L	a _{p max}					
FMA07-050-A22-ON06-05		●	○	50	62	22	40	4	5	A	0.3	ONHU0604	
FMA07-050-A22-ON06-05C	*	●	○	50	62	22	40	4	5	A	0.3		
FMA07-063-A22-ON06-06		●	○	63	75	22	40	4	6	A	0.5		
FMA07-063-A22-ON06-06C	*	●	○	63	75	22	40	4	6	A	0.5		
FMA07-080-A27-ON06-07C	*	●	○	80	92	27	50	4	7	A	1		
FMA07-080-B27-ON06-07		●	○	80	92	27	50	4	7	B	1		
FMA07-080-B27-ON06-07C	*	●	○	80	92	27	50	4	7	B	1		
FMA07-100-B32-ON06-08		●	○	100	112	32	63	4	8	B	1.9		
FMA07-100-B32-ON06-08C	*	●	○	100	112	32	63	4	8	B	1.9		
FMA07-125-B40-ON06-09		●	○	125	137	40	63	4	9	B	3.5		
FMA07-125-B40-ON06-09C	*	●	○	125	137	40	63	4	9	B	3.5		
FMA07-160-C40-ON06-11		○	○	160	172	40	63	4	11	C	4.3		
FMA07-200-C60-ON06-13		○	○	200	212	60	63	4	13	C	6.4		
FMA07-250-C60-ON06-15		○	○	250	262	60	63	4	15	C	13.4		
FMA07-315-D60-ON06-17		○	○	315	327	60	80	4	17	D	21.9		
<hr/>													
FMA07-063-A22-ON08-05		●	○	63	78	22	40	5	5	A	0.5		ONHU08T5
FMA07-063-A22-ON08-05C	*	●	○	63	78	22	40	5	5	A	0.5		
FMA07-080-A27-ON08-06C	*	●	○	80	95	27	50	5	6	A	0.9		
FMA07-080-B27-ON08-06		●	○	80	95	27	50	5	6	B	0.9		
FMA07-080-B27-ON08-06C	*	○	○	80	95	27	50	5	6	B	0.9		
FMA07-100-B32-ON08-07		●	○	100	115	32	63	5	7	B	1.8		
FMA07-100-B32-ON08-07C	*	●	○	100	115	32	63	5	8	B	3.1		
FMA07-125-B40-ON08-08		●	○	125	140	40	63	5	8	B	3.1		
FMA07-125-B40-ON08-08C	*	●	○	125	140	40	63	5	8	B	3.1		
FMA07-160-C40-ON08-10		●	○	160	175	40	63	5	10	C	4.1		
FMA07-200-C60-ON08-12		●	○	200	215	60	63	5	12	C	6.1		
FMA07-250-C60-ON08-14		●	○	250	265	60	63	5	14	C	12		
FMA07-315-D60-ON08-16		●	○	315	330	60	80	5	16	D	21		

● Ex stock ○ On demand





* With internal cooling

System code > B22




Grade selection > B20

Technical info > B447

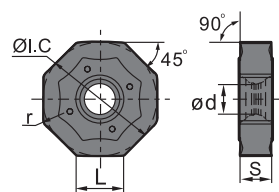


Cutting data > B216

Spare parts			
Insert	ONHU0604	ONHU08T5	
ØD	50- 315	63- 315	
 Screw (insert)	I60M4*10	I60M5*13	
 Wrench (insert)		WT20IT	
 Wrench (insert)	WT15IS		

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ONHU	L	I.C	S	d
06 04	6.58	15.875	4.76	4.4
08 T5	8.37	20.2	5.77	5.3

ON** milling insert		HC ¹ (CVD)								HC ¹ (PVD)								HT	HC ²	HW									
		P	M	K	N	S	H	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
ISO		r																											
	ONHU060408-PF	0.8	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	ONHU08T508-PF	0.8	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	ONHU060408-PM	0.8	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	ONHU08T508-PM	0.8	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



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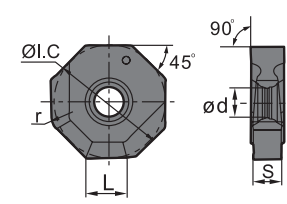

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ONHU	L	I.C	S	d
08 T5	6.9	20.5	6	5.3

Milling inserts

ON** milling insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
 ONHU08T508-W	0.8							●		○													

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

FMA 11 *Kr: 45°*

New face mill generation

- Double sided, extra thick insert with 8 cutting edges.
- Large rake angle reduces cutting forces.
- More stability for larger cutting depths.
- Wiper geometry for better surface quality.

Insert grades

YBC302

CVD
P15 – P35

YBM253

CVD
P10 – P40

YBD152

CVD
K05 – K25

YBD252

CVD
K15 – K35

YBG205

PVD
P10 – P30
M20 – M30

YB9320

PVD
P15 – P25
M20 – M30

Chip breakers

-GM



- General machining

-GR



- Stable cutting edge

-E



- Sharp cutting edge
- First choice for stainless steel

-W



- Wiper geometry for best surface quality

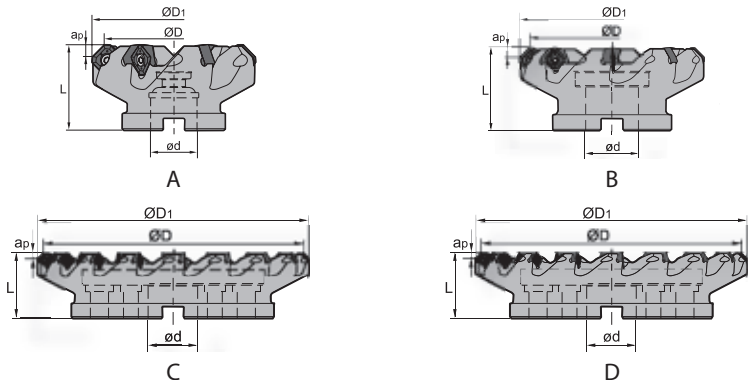
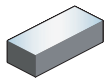
Insert sizes

a_p max:



Face milling

FMA11 Kr: 45°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA11-063-A22-SN12-05	●	63	74.47	22	40	5.5	5	A	0.55	SNEG1205		
FMA11-063-A22-SN12-06	●	63	74.47	22	40	5.5	6	A	0.58			
FMA11-080-A27-SN12-06	●	80	91.47	27	50	5.5	6	A	1.14			
FMA11-100-B32-SN12-07	●	100	111.47	32	50	5.5	7	B	1.42			
FMA11-100-B32-SN12-07C	* ●	100	111.47	32	50	5.5	7	B	1.42			
FMA11-100-B32-SN12-10C	* ●	100	111.47	32	50	5.5	10	B	1.42			
FMA11-125-B40-SN12-08	●	125	136.47	40	63	5.5	8	B	2.86			
FMA11-125-B40-SN12-08C	* ●	125	136.47	40	63	5.5	8	B	2.86			
FMA11-125-B40-SN12-12C	* ●	125	136.47	40	63	5.5	12	B	2.86			
FMA11-160-C40-SN12-10	●	160	171.47	40	63	5.5	10	C	4.06			
FMA11-160-C40-SN12-15	●	160	171.47	40	63	5.5	15	C	4.06			
FMA11-200-C60-SN12-14	●	200	212.08	60	63	5.5	14	C	6.89			
FMA11-063-A22-SN15-05	●	63	77.4	22	40	7	5	A	0.56	SNEG1506		
FMA11-080-A27-SN15-06	●	80	94.4	27	50	7	6	A	1.06			
FMA11-100-B32-SN15-07	●	100	114.4	32	50	7	7	B	1.47			
FMA11-100-B32-SN15-07C	* ●	100	114.4	32	50	7	7	B	1.47			
FMA11-100-B32-SN15-09C	* ●	100	114.4	32	50	7	9	B	1.47			
FMA11-125-B40-SN15-08	●	125	139.4	40	63	7	8	B	2.7			
FMA11-125-B40-SN15-08C	* ●	125	139.4	40	63	7	8	B	2.7			
FMA11-125-B40-SN15-10C	* ●	125	140.25	40	63	7	10	B	3.1			
FMA11-160-C40-SN15-10	●	160	174.4	40	63	7	10	C	3.92			
FMA11-160-C40-SN15-13	●	160	175.25	40	63	7	13	C	4.14			
FMA11-200-C60-SN15-12	●	200	214.4	60	63	7	12	C	5.46			
FMA11-250-C60-SN15-14	●	250	264.4	60	63	7	14	C	11.26			
FMA11-315-D60-SN15-18	○	315	329.4	60	80	7	18	D	20			

● Ex stock ○ On demand


* With internal cooling

System code > B22

Grade selection > B20




Technical info > B447


Cutting data > B216

Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts 
		R	L	ØD	ØD ₁	ød	L	a _p max				
FMA11-125-B40-SN19-07	●			125	142.63	40	63	9	7	B	3	SNEG1907
FMA11-125-B40-SN19-07C	* ●			125	142.63	40	63	9	7	B	3	
FMA11-160-C40-SN19-09	●			160	167.63	40	63	9	9	C	4.25	
FMA11-200-C60-SN19-11	●			200	217.63	60	63	9	11	C	6.18	
FMA11-250-C60-SN19-13	●			250	267.63	60	63	9	13	C	11.55	
FMA11-315-D60-SN19-16	○			315	332.63	60	80	9	16	D	20.9	




● Ex stock ○ On demand

* With internal cooling



Spare parts				
	Insert ØD	SNEG1205 63-200	SNEG1506 63-315	SNEG1907 125-315
	Screw (insert)	I60M3.5*10	I60M5*13	I43M6*16
	Wrench (insert)	WT15IS		
	Wrench (insert)		WT20IT	WT25IT



SNEG	L	I.C	S	d
12 05	7.6	12	4.76	4.6
15 06	9.4	15	5.54	5.5
19 07	12.1	19	7	7.2

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

SN** negative insert			HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW
			P	M	K	N	S	H							
	SNEG1506ANR-E	0.9	1.3	●	●	●	●	●	●	●	●	●	●	●	●
	SNEG1205ANR-GM	0.8	1.05	●	●	●	●	●	●	●	●	●	●	●	●
	SNEG1506ANR-GM	0.9	1.3	●	●	●	●	●	●	●	●	●	●	●	●

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

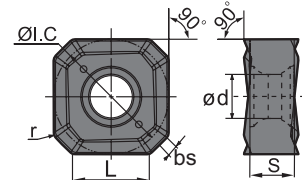

E

Index

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SNEG	L	I.C	S	d
12 05	7.6	12	4.76	4.6
15 06	9.4	15	5.54	5.5
19 07	12.1	19	7	7.2

Milling inserts

SN** negative insert			HC ¹ (CVD)								HC ¹ (PVD)				HT	HC ²	HW											
	P	M	K	N	S	H	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ISO	r	bs																									
		SNEG1205ANR-GR	0.8	1.05	●	●	●																					
		SNEG1506ANR-GR	0.9	1.3	●	●	●																					
		SNEG1907ANR-GR	1	1.67	●	●	● ●																					

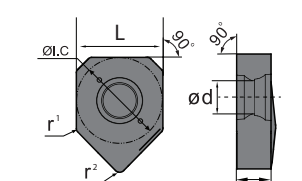

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SNEG	L	I.C	S	d
12 05	12	12	4.76	4.6

Milling inserts

SN** negative insert			HC ¹ (CVD)								HC ¹ (PVD)				HT	HC ²	HW											
	P	M	K	N	S	H	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ISO	r1	r2																									
		SNEG1205ANR-W	0.6	0.8															●									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



FMA12 *Kr: 45°*

Face mill

- High cost-benefit factor due to 16 cutting edges.
- Three-dimensional chip breaker for tough materials.
- Smooth cut due to positive and sharp cutting edge.

Insert grades

YBM253

PVD
P20–P40
M10–M30

YBG205

PVD
P10–P30
M10–M30

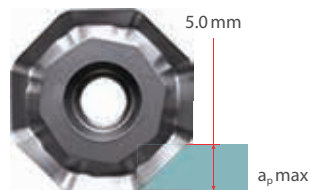
YBD152

CVD
K05–K25

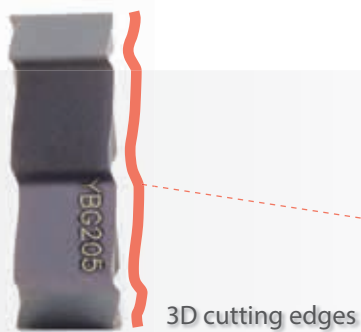
16 cutting edges

Chip breakers

-GM

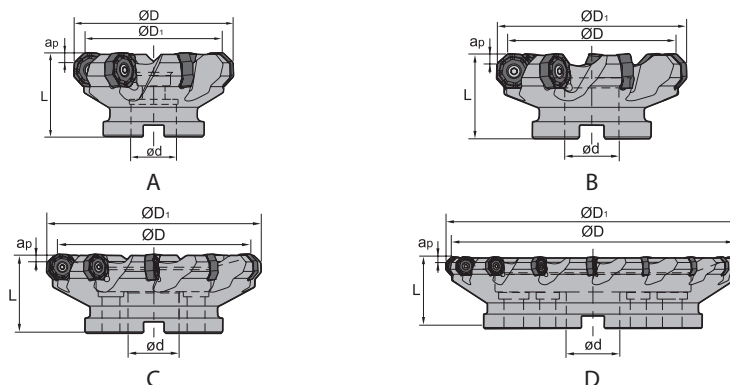
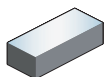


ONHU08T624R-GM



Face milling

FMA12 Kr: 45°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMA12-063-A22-ON08-05	●	63	78	22	50	5	5	A	0.6	ONHU08T6		
FMA12-080-A27-ON08-06	●	80	95	27	50	5	6	A	0.97			
FMA12-100-B32-ON08-07	●	100	115	32	50	5	7	B	1.28			
FMA12-100-B32-ON08-07C	* ●	100	115	32	50	5	7	B	1.28			
FMA12-125-B40-ON08-08	●	125	140	40	63	5	8	B	2.59			
FMA12-125-B40-ON08-08C	* ●	125	140	40	63	5	8	B	2.59			
FMA12-160-C40-ON08-10	●	160	175	40	63	5	10	C	4.1			
FMA12-200-C60-ON08-12	●	200	215	60	63	5	12	C	5.68			
FMA12-250-C60-ON08-14	○	250	265	60	63	5	14	C	11.9			
FMA12-315-D60-ON08-18	○	315	330	60	80	5	18	D	20.41			

● Ex stock ○ On demand

* With internal cooling

Spare parts




Insert		ONHU08T6	
ØD		63- 315	
	Screw (insert)	I60M5*13	
	Wrench (insert)	WT20IT	

System code > B22

Grade selection > B20

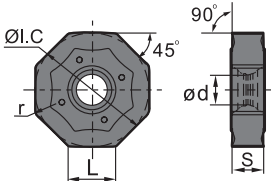

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ONHU	L	I.C	S	d
08 T6	6.38	20.2	6.3	5.3

Milling inserts

ON** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
 ONHU08T624R-GM	2.4				●			○					●										

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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FMD02 *Kr: 67°*

Face mill

- Smooth-cutting inserts due to trough-shaped chip breaker.
- Chamfer with wiper for best surface quality.
- Wide selection of inserts with 6 different chip breakers.
- Milling body available in wide, normal and close pitch (wedge clamping).

Insert grades

YBC302

CVD
P15–P35

YBM253

PVD
P10–P40

YBD152

CVD
K05–K25

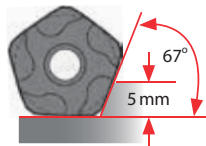
YBD252

CVD
K15–K35



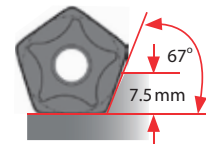
Chip breakers

-CF -CM -CR



• Cast iron machining
 $a_{p,max} = 5 \text{ mm}$

-PF -PM -PR



• Steel
 $a_{p,max} = 7.5 \text{ mm}$



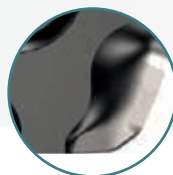
• Entry angle $Kr = 67^\circ$



• Screw clamping



• Wedge clamping

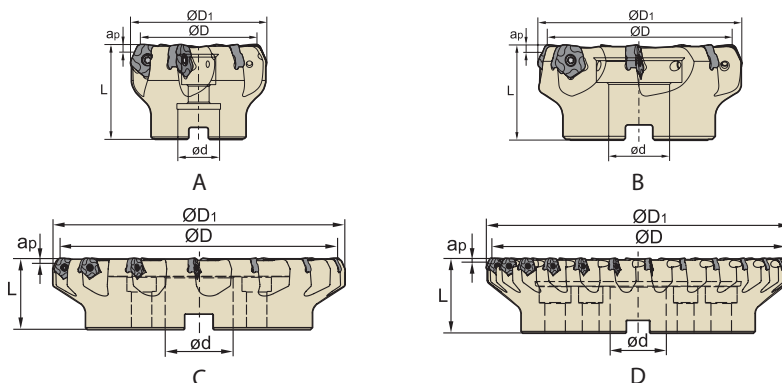
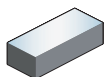


• Wiper



Face milling

FMD02 Kr: 67°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	Ød	L	a _{p max}				
FMD02-050-A22-PN11-04		●	●	50	60.1	22	50	5	4	A	0.6	PNEG1105
FMD02-050-A22-PN11-04C	*	○	○	50	60.1	22	50	5	4	A	0.6	
FMD02-050-A22-PN11-05		●	○	50	60.1	22	50	5	5	A	0.6	
FMD02-050-A22-PN11-05C	*	●	○	50	60.1	22	50	5	5	A	0.6	
FMD02-063-A22-PN11-05		●	○	63	73.1	22	50	5	5	A	0.8	
FMD02-063-A22-PN11-05C	*	●	○	63	73.1	22	50	5	5	A	0.8	
FMD02-063-A22-PN11-06		●	○	63	73.1	22	50	5	6	A	0.9	
FMD02-063-A22-PN11-06C	*	●	○	63	73.1	22	50	5	6	A	0.9	
FMD02-080-A27-PN11-06		●	○	80	90.1	27	50	5	6	A	1.1	
FMD02-080-A27-PN11-06C	*	●	○	80	90.1	27	50	5	6	A	1.1	
FMD02-080-A27-PN11-08		●	○	80	90.1	27	50	5	8	A	1.2	
FMD02-080-A27-PN11-08C	*	●	○	80	90.1	27	50	5	8	A	1.2	
FMD02-100-B32-PN11-07		●	○	100	110.1	32	50	5	7	B	1.8	
FMD02-100-B32-PN11-07C	*	●	○	100	110.1	32	50	5	7	B	1.8	
FMD02-100-B32-PN11-10		●	○	100	110.1	32	50	5	10	B	1.9	
FMD02-100-B32-PN11-10C	*	○	○	100	110.1	32	50	5	10	B	1.9	
FMD02-125-B40-PN11-08		●	●	125	135.1	40	63	5	8	B	2.9	
FMD02-125-B40-PN11-08C	*	○	○	125	135.1	40	63	5	8	B	2.9	
FMD02-125-B40-PN11-12		●	○	125	135.1	40	63	5	12	B	3.2	
FMD02-125-B40-PN11-12C	*	○	○	125	135.1	40	63	5	12	B	3.2	
FMD02-160-B40-PN11-10		●	○	160	170.1	40	63	5	10	B	5.6	
FMD02-160-B40-PN11-14		●	○	160	170.1	40	63	5	14	B	6.4	
FMD02-200-C60-PN11-12		○	○	200	210.1	60	63	5	12	C	7.9	
FMD02-200-C60-PN11-16		●	○	200	210.1	60	63	5	16	C	8.5	
FMD02-200-C60-PN11-20		○	○	200	210.1	60	63	5	20	C	8.5	
FMD02-200-C60-PN11-24		●	○	200	210.1	60	63	5	24	C	8.6	
FMD02-250-C60-PN11-14		○	○	250	260.1	60	63	5	14	C	13.4	
FMD02-250-C60-PN11-18		●	○	250	260.1	60	63	5	18	C	18	
FMD02-250-C60-PN11-30		○	○	250	260.1	60	63	5	30	C	13.5	
FMD02-315-D60-PN11-26		●	○	315	325.1	60	80	5	26	D	24.5	

● Ex stock ○ On demand

* With internal cooling

System code >> B22

Grade selection >> B20

Technical info >> B447

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A

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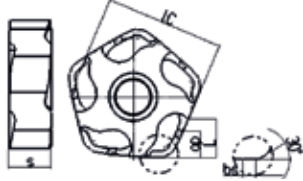



Spare parts		
Insert	PNEG1105	
ØD	50-315	
 Screw (insert)	I60M4*10	
 Wrench (insert)	WT15IS	



-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

PNEG	L	I.C	S	d
11 05	5.4	15.875	5.56	4.64

Milling inserts

PN** milling insert			HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW													
	P	M	K	N	S	H	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ISO	bs	a _{p max}																									
		PNEG110512L-CF	1.6	5																								
		PNEG110512R-CF	1.6	5										●														
		PNEG110512L-CM	1.6	5										○														
		PNEG110512R-CM	1.6	5										●														
	PNEG110512L-CR	1.6	5										○	○														
	PNEG110512R-CR	1.6	5										●	●														

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



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- Ideal machining conditions
- ⊕ Normal machining conditions
- ⊗ Unfavourable machining conditions

PNEG	L	I.C	S	d
11 05	7.5	15.875	5.56	4.64

Milling inserts

PN** milling insert				HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW						
				P	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕					
				M	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕				
				K	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕			
				N	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕			
				S	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕			
				H	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕			
ISO		bs	a _{p max}	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	PNEG110512L-PF	1.6	7.5	○																				
	PNEG110512R-PF	1.6	7.5	●	○																			
	PNEG110512L-PM	1.6	7.5	○	○																			
	PNEG110512R-PM	1.6	7.5	●	●																			
	PNEG110512L-PR	1.6	7.5	○	●																			
	PNEG110512R-PR	1.6	7.5	○	●																			

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

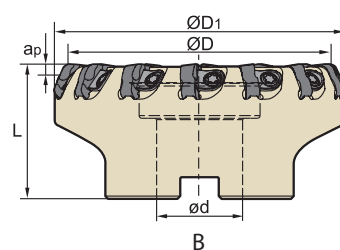
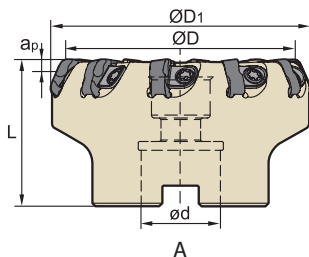
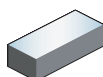
Grade selection > B20

Technical info > B447

Cutting data > B216

Face milling

FMD02 Kr: 67°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMD02-080-A27-PN11-10	●	○	80	90.1	27	50	5	10	A	1.3	PNEG1105	
FMD02-080-A27-PN11-10C	*	○	80	90.1	27	50	5	10	A	1.3		
FMD02-100-B32-PN11-14	●	○	100	110.1	32	50	5	14	B	1.6		
FMD02-100-B32-PN11-14C	*	●	100	110.1	32	50	5	14	B	1.6		
FMD02-125-B40-PN11-18	●	○	125	135.1	40	63	5	18	B	3.2		
FMD02-125-B40-PN11-18C	*	○	125	135.1	40	63	5	18	B	3.2		
FMD02-160-B40-PN11-22	●	○	160	170.1	40	63	5	22	B	5.8		
FMD02-200-C60-PN11-28	○	○	200	210.1	60	63	5	28	C	8.5		
FMD02-200-C60-PN11-36	○	○	200	210.1	60	63	5	36	C	8.5		

● Ex stock ○ On demand

* With internal cooling

Spare parts		
	Insert ØD	PNEG1105 80-200
	Screw (wedge)	DM6*20A
	Wedge	W18N
	Wrench (wedge)	WT15IT



System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



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- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

PNEG	L	I.C	S	d
11 05	5.4	15.875	5.56	4.64

Milling inserts

PN** milling insert				HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
		P		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		M		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		K						⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		N						⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		S				⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		H																						
ISO		bs	a _{p max}	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	PNEG110512L-CF	1.6	5							○														
	PNEG110512R-CF	1.6	5							●														
	PNEG110512L-CM	1.6	5							○														
	PNEG110512R-CM	1.6	5							●														
	PNEG110512L-CR	1.6	5							○ ○														
	PNEG110512R-CR	1.6	5							● ●														

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

PNEG	L	I.C	S	d
11 05	7.5	15.875	5.56	4.64

Milling inserts

PN** milling insert				HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
		P		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗									
		M		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		K						⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		N						⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		S				⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗							
		H																						
ISO		bs	a _{p max}	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	PNEG110512L-PF	1.6	7.5							○														
	PNEG110512R-PF	1.6	7.5							●	○													
	PNEG110512L-PM	1.6	7.5							○	○													
	PNEG110512R-PM	1.6	7.5							●	●													

● Ex stock ○ On demand




HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

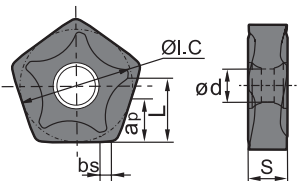

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

PNEG	L	I.C	S	d
11 05	7.5	15.875	5.56	4.64

Milling inserts

PN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW							
	P	M	K	N	S	H																	
ISO	bs	a _p max	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
 PNEG110512L-PR	1.6	7.5	○		●																		
PNEG110512R-PR	1.6	7.5	○		●																		

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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System code > B22

Grade selection > B20

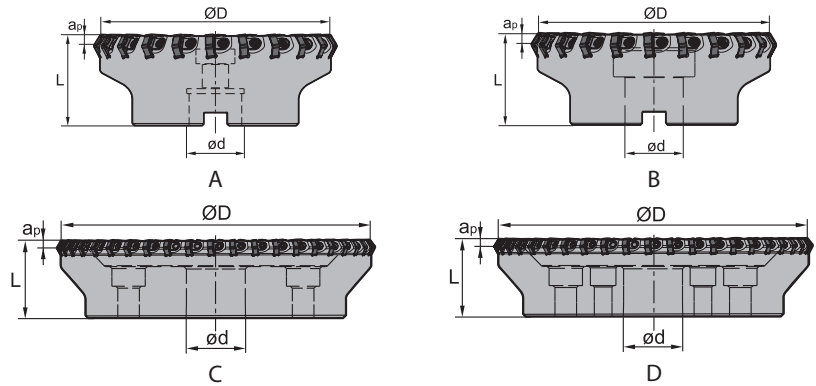
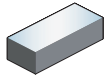
Technical info > B447


Cutting data > B216



Face milling




FMD02 Kr: 55°




Article	*	Stock		Dimensions [mm]			Teeth	Coupling	kg	Inserts 
		R	L	ØD	L	a _{p max}				
FMD02-080-A27-HN09-08	○			80	50	6	8	A	1.19	HNEX0905
FMD02-080-A27-HN09-10	○	○		80	50	6	10	A	1.1	
FMD02-100-B32-HN09-10	○			100	50	6	10	B	1.77	
FMD02-100-B32-HN09-14	○	○		100	63	6	14	B	2.6	
FMD02-125-B40-HN09-14	○			125	63	6	14	B	3.55	
FMD02-125-B40-HN09-18	○	○		125	63	6	18	B	3.7	
FMD02-160-B40-HN09-18	●			160	63	6	18	B	5.62	
FMD02-160-B40-HN09-22	○	○		160	63	6	22	B	5.6	
FMD02-200-C60-HN09-22	○			200	63	6	22	C	6.7	
FMD02-200-C60-HN09-28	○	○		200	63	6	28	C	6.3	
FMD02-250-C60-HN09-28	○			250	63	6	28	C	13	
FMD02-250-C60-HN09-36	○	○		250	63	6	36	C	10.3	
FMD02-315-C60-HN09-32	○			315	63	6	32	C	21.7	
FMD02-315-C60-HN09-44	○			315	63	6	44	C	21.7	
FMD02-315-D60-HN09-44		○		315	63	6	44	D	21.7	

● Ex stock ○ On demand

* With internal cooling

Spare parts		
	Insert	HNEX0905
	ØD	80-315
	Screw (wedge)	DM6*20A
	Wedge	W18N
	Wrench (wedge)	WT15IT






System code > B22

Grade selection > B20

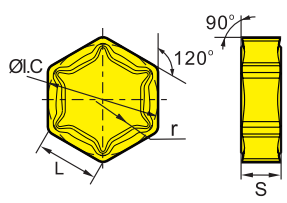



















































Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

HNEX	L	I.C	S
09 05	9.16	15.875	5.56

Milling inserts

HN** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	HNEX090512-DF	1.2						○															
	HNEX090512-DM	1.2						○	○														
	HNEX090512-DR	1.2						●	●														

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

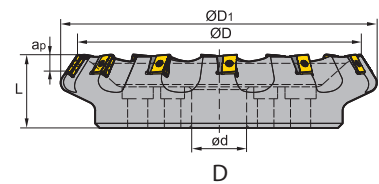
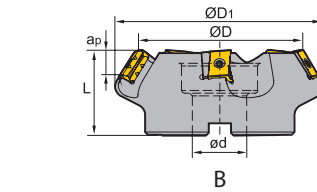
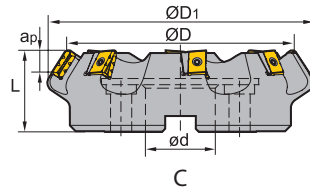
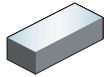
Technical info > B447

Cutting data > B216



Face milling

FMD03 Kr: 60°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FMD03-100-B32-LN20-05	●			100	129	32	63	12	5	B	3.02	LNKT2007-ZR
FMD03-125-B40-LN20-06	●	○		125	153	40	63	12	6	B	4.5	
FMD03-160-C40-LN20-08	●	○		160	187	40	63	12	8	C	6.9	
FMD03-160-C40-LN20-09	●			160	187	40	63	12	9	C	6.7	
FMD03-200-C60-LN20-10	●	○		200	227	60	70	12	10	C	10.5	
FMD03-250-C60-LN20-12	●	○		250	276	60	70	12	12	C	13.4	
FMD03-315-D60-LN20-15	○	○		315	339	60	80	12	15	D	26.2	
FMD03-125-B40-LN25-05	○	○		125	154	40	63	16	5	B	4.5	LNKT2510-ZR
FMD03-160-C40-LN25-06	●	○		160	189	40	63	16	6	C	6.9	
FMD03-200-C60-LN25-08	●	○		200	229	60	70	16	8	C	10.5	
FMD03-250-C60-LN25-10	●	○		250	278	60	70	16	10	C	16.7	
FMD03-315-D60-LN25-12	●	○		315	346	60	80	16	12	D	27.3	
FMD03-400-D60-LN25-16	○	○		400	427	60	80	16	16	D	47.1	

● Ex stock ○ On demand

* With internal cooling

Spare parts			
	Insert	LNKT2007-ZR	LNKT2510-ZR
	ØD	100-315	125-400
	Screw (insert)	I60M4*15	I60M5*17
	Screw (shim)	I60M3*7	I60M3.5*10.4
	Shim	LLN20R-ZR	LLN25R-ZR
	Wrench (insert)	WT15IS	
	Wrench (insert)		WT20IT
	Wrench (shim)	WT09IS	WT15IS






System code > B22

Grade selection > B20

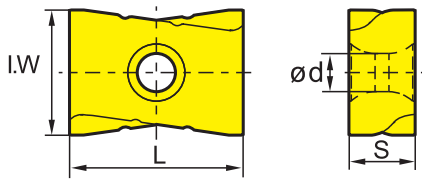

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

LNKT	L	S	d
20 07	20	7.94	4.6
25 10	25	9.525	5.5

Milling inserts

LN** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNKT2007DN-ZR	17			●	●	●	●								●							
	LNKT2510-ZR	18				●	●	●								●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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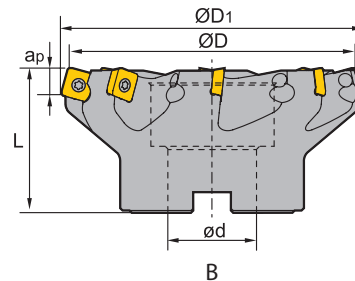
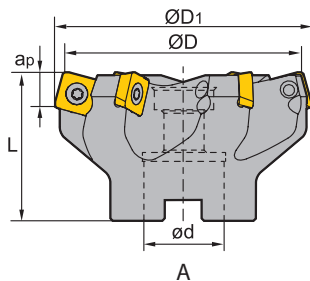
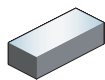
Technical info > B447


Cutting data > B216



Face milling




FME02 Kr: 75°



Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
			ØD	ØD ₁	ød	L	a _{p max}				
FME02-050-A22-SP12-04	●		50	54	22	40	6	4	A	0.3	 SPKT1204 SPKW1204
FME02-063-A22-SP12-05	●		63	66	22	50	6	5	A	0.6	
FME02-080-A27-SP12-06	●		80	83	27	50	6	6	A	0.9	
FME02-100-B32-SP12-07	●		100	103	32	50	6	7	B	1.4	
FME02-125-B40-SP12-08	●		125	128	40	63	6	8	B	2.5	

● Ex stock ○ On demand

* With internal cooling

Spare parts			
	Insert	SPKT1204 SPKW1204	
	ØD	50-125	
	Screw (insert)	I60M5*13.2	
	Wrench (insert)	WT20IS	




System code > B22

Grade selection > B20

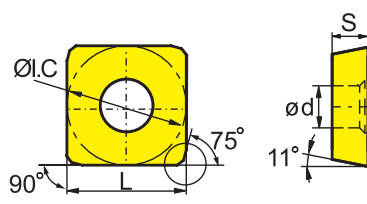

Technical info > B447

Cutting data > B216

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions




SPKW	L	I.C	S	d
12 04	12.7	12.7	4.76	5.56

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
 <p>ØI.C 90° L 75° 11° S ød</p>	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPKW1204EDFR SPKW1204EDSR													○	●								

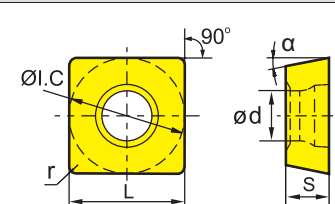

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPKT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.56

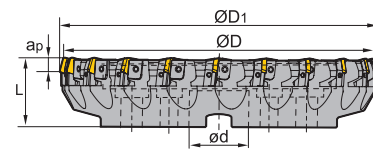
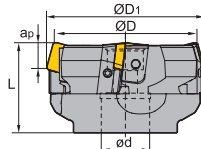
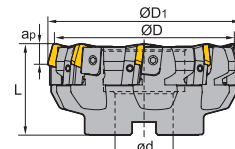
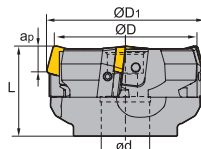
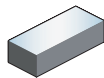
SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
 <p>ØI.C 90° L r α S ød</p>	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPKT1204EDR													●									

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Face milling

FME03 Kr: 75°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	$\varnothing D$	$\varnothing D_1$	$\varnothing d$	L	$a_{p\max}$				
FME03-080-A27-SP12-04		○	○	80	84	27	50	6	4	A	1.1	SPKN1203 SPKR1203 SPEX1203
FME03-100-B32-SP12-06		●	○	100	104	32	50	6	6	B	1.9	
FME03-125-B40-SP12-08		○	○	125	129	40	63	6	8	B	3.5	
FME03-160-B40-SP12-10		●	○	160	164	40	63	6	10	B	5.7	
FME03-200-C60-SP12-12		○	○	200	203	60	63	6	12	C	8.2	
FME03-250-C60-SP12-16		○	○	250	253	60	63	6	16	C	13.8	
FME03-315-D60-SP12-20		○	○	315	318	60	70	6	20	D	23.5	SPKN1504 SPKR1504 SPEX1504
FME03-080-A27-SP15-04		○	○	80	84	27	50	8	4	A	1	
FME03-100-B27-SP15-06		○	○	100	104	27	50	8	6	B	1.8	
FME03-125-B40-SP15-08		●	○	125	129	40	63	8	8	B	3.3	
FME03-160-B40-SP15-10		○	○	160	164	40	63	8	10	B	5.4	
FME03-200-C60-SP15-12		○	○	200	204	60	63	8	12	C	7.9	
FME03-250-C60-SP15-16		○	○	250	253	60	63	8	16	C	13.6	
FME03-315-D60-SP15-20		○	○	315	318	60	70	8	20	D	23.1	

● Ex stock ○ On demand










* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

Spare parts					
	Insert	SPKN1203 SPKR1203 SPEX1203	SPKN1203 SPKR1203 SPEX1203	SPKN1504 SPKR1504 SPEX1504	
	ØD	80-100	125 - 315	80- 315	
	Adjustable screw	LOM5*15.1	LOM5*15.1	LOM5*15.1	
	Cassette (left)	LSP12L	LSP12L	LSP15L	
	Cassette (right)	LSP12R	LSP12R	LSP15R	
	Screw (wedge)	WM8*17	WM8*22	WM8*22	
	Wedge (left)	W04L	W04L	W04L	
	Wedge (right)	W04R	W04R	W04R	
	Wrench (locator)	WT20T	WT20T	WT20T	
	Wrench (wedge)	WT25T	WT25T	WT25T	

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPKN	L	I.C	S
12 03	12.7	12.7	3.18
15 04	15.875	15.875	4.76

Milling inserts

SP** milling insert			HC ¹ (CVD)								HC ¹ (PVD)					HT	HC ²	HW									
ISO	be	bs	P	M	K	N	S	H																			
			YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201				
			SPKN1203EDEL	1	1.4																						
			SPKN1203EDER	1	1.4																						
			SPKN1203EDFL	1	1.4																						
			SPKN1203EDFR	1	1.4	○							○													●	●
SPKN1203EDS31PL	1	1.4																									
SPKN1203EDS31PR	1	1.4									○																
SPKN1203EDSKL	1	1.4	●										●														
SPKN1203EDSKR	1	1.4	●	●					○				●		●												
SPKN1203EDT31L	1	1.4																									
SPKN1203EDT31R	1	1.4																									
SPKN1203EDTKL	1	1.4																									
SPKN1203EDTKR	1	1.4	○				○								○												
SPKN1504EDEL	1	1.4																									
SPKN1504EDER	1	1.4																									
SPKN1504EDFL	1	1.4																					○				
SPKN1504EDFR	1	1.4																					○				
SPKN1504EDL	1	1.4																					●				
SPKN1504EDS32PL	1	1.4																									
SPKN1504EDS32PR	1	1.4	○												○												
SPKN1504EDSKL	1	1.4														○											
SPKN1504EDSKR	1	1.4	●						●				●		●												
SPKN1504EDT32PL	1	1.4																									
SPKN1504EDT32PR	1	1.4													○												
SPKN1504EDTKL	1	1.4																									
SPKN1504EDTKR	1	1.4													○												

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

Milling inserts

- Ideal machining conditions
- ⊕ Normal machining conditions
- ⊗ Unfavourable machining conditions

SPKR	L	I.C	S
12 03	12.7	12.7	3.18
15 04	15.875	15.875	4.76

SP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
		P	M	K	N	S	H																	
ISO		be	bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPKR1203EDL-GM	1	1.4				●																	
	SPKR1203EDR-GM	1	1.4				●																	
	SPKR1504EDL-GM	1	1.4				●								●									
	SPKR1504EDR-GM	1	1.4				●								●									
	SPKR1203EDR	1	1.4	○																				

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

- Ideal machining conditions
- ⊕ Normal machining conditions
- ⊗ Unfavourable machining conditions

SPEX	I.C	S
12 03	12.7	3.18
15 04	15.875	4.76

SP** milling insert						HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW											
				P	M	K	N	S	H																				
ISO				A	R	I.W	bs	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPEX1203EDL-1	15	500	12.7	10																								
	SPEX1203EDR-1	15	500	12.7	10																								
	SPEX1504EDL-1	18.2	500	15.875	10																								
	SPEX1504EDR-1	18.2	500	15.875	10																								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

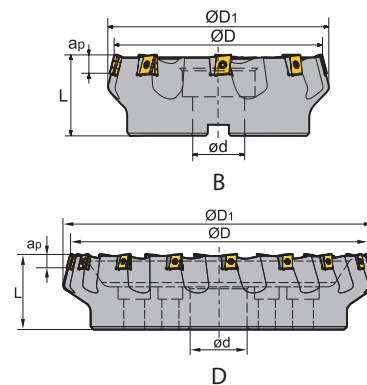
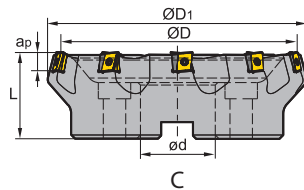
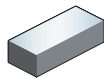
Technical info > B447

Cutting data > B216



Face milling

FME04 Kr: 75°



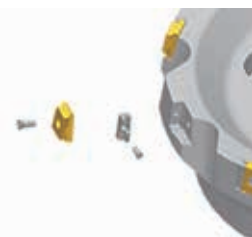
Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD ₁	ød	L	a _{p max}				
FME04-125-B40-LN15-06	● ○	125	137	40	63	10	6	B	3.8	LNKT1506-ZR		
FME04-160-B40-LN15-08	● ○	160	170	40	63	10	8	C	6.6			
FME04-200-C60-LN15-10	● ○	200	208	60	70	10	10	C	9.6			
FME04-250-C60-LN15-12	○ ○	250	257	60	70	10	12	C	13.4			
FME04-315-D60-LN15-16	○ ○	315	328	60	80	10	16	D	25.2			

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	LNKT1506-ZR
	ØD	125 - 315
	Screw (insert)	I60M4*12
	Screw (shim)	I60M3*7
	Shim	LLN15-ZR
	Wrench (insert)	WT15IS
	Wrench (shim)	WT09IS






System code > B22

Grade selection > B20

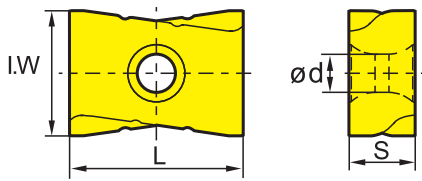








































Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

LNKT	L	S	d
15 06	15.875	6.35	4.6

Milling inserts

LN** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNKT1506EN-ZR	14	●			●	●	●	●							●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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System code > B22

Grade selection > B20

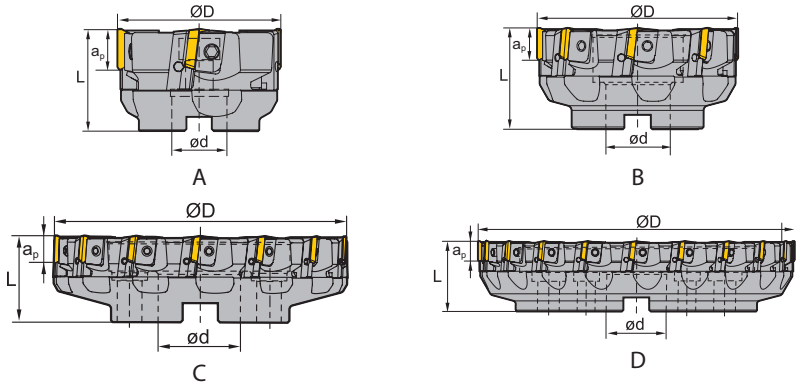
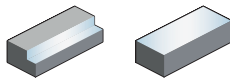
Technical info > B447


Cutting data > B216



Face milling

FMP01 Kr: 90°











Article	*	Stock		Dimensions [mm]				Teeth	Coupling	kg	Inserts 
		R	L	ØD	ød	L	$a_{p\max}$				
FMP01-080-A27-TP22-04	● ○	80	27	50	18	4	A	1.2	TPKN2204		
FMP01-100-B32-TP22-06	● ○	100	32	50	18	6	B	1.7			
FMP01-125-B40-TP22-08	● ○	125	40	63	18	8	B	3.2			
FMP01-160-B40-TP22-10	● ○	160	40	63	18	10	B	5.1			
FMP01-200-C60-TP22-12	● ○	200	60	63	18	12	C	7.4			
FMP01-250-C60-TP22-16	○ ○	250	60	63	18	16	C	12.3			
FMP01-315-D60-TP22-20	○ ○	315	60	70	18	20	D	21.9			

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	TPKN2204 80-100	TPKN2204 125 - 315
	Adjustable screw	LOM5*15.1	LOM5*15.1
	Cassette (left)	LTP4L1	LTP4L
	Cassette (right)	LTP4R1	LTP4R
	Screw (wedge)	WM8*12	WM8*22
	Wedge (left)	W04L	W04L
	Wedge (right)	W04R	W04R
	Wrench (locator)	WT20T	WT20T
	Wrench (wedge)	WT25T	WT25T






System code > B22

Grade selection > B20


Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

TPKN	L	I.C	S
22 04	22	12.7	4.76

Milling inserts

TP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW
				P	M	K	N	S	H									
	TPKN2204PDFL	1.4	0.7	11°														
	TPKN2204PDFR	1.4	0.7	11°														
	TPKN2204PDL	1.4	0.7	11°	●												●	
	TPKN2204PDR	1.4	0.7	11°														
	TPKN2204PDS32PR	1.4	0.7	11°														
	TPKN2204PDSKL	1.4	0.7	11°	○													
	TPKN2204PDSKR	1.4	0.7	11°	●	●		●	●									
	TPKN2204PDTKR	1.4	0.7	11°														
	TPKN2204PDTR	1.4	0.7	11°	○													

● Ex stock ○ On demand

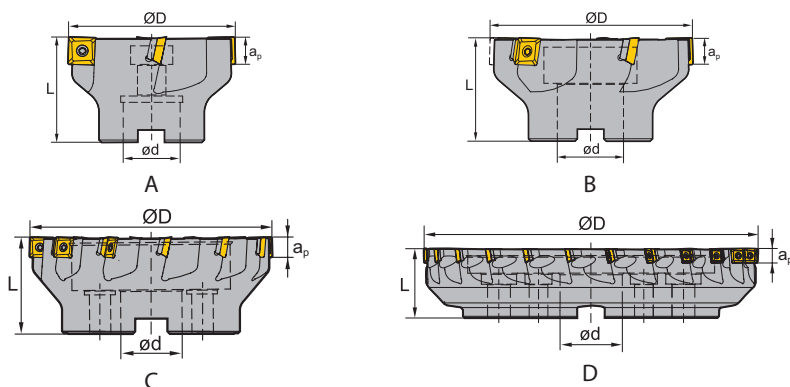
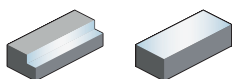
HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Face milling

FMP02 Kr: 90°



Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts
			ØD	ød	L	a _{p max}				
FMP02-050-A22-SE09-05		●	50	22	40	6.7	5	A	0.3	SEET09T3
FMP02-050-A22-SE09-05C	*	●	50	22	40	6.7	5	A	0.3	
FMP02-063-A22-SE09-06		●	63	22	40	6.7	6	A	0.5	
FMP02-063-A22-SE09-06C	*	●	63	22	40	6.7	6	A	0.5	
FMP02-080-A27-SE09-08		●	80	27	50	6.7	8	A	0.9	
FMP02-080-A27-SE09-08C	*	●	80	27	50	6.7	8	A	0.9	
FMP02-100-B32-SE09-08		○	100	32	50	6.7	8	B	1.7	
FMP02-100-B32-SE09-08C	*	○	100	32	50	6.7	8	B	1.7	
FMP02-100-B32-SE09-10		○	100	32	50	6.7	10	B	1.7	
FMP02-100-B32-SE09-10C	*	○	100	32	50	6.7	10	B	1.7	
FMP02-125-B40-SE09-12		●	125	40	63	6.7	12	B	2.6	
FMP02-125-B40-SE09-12C	*	●	125	40	63	6.7	12	B	2.6	
FMP02-050-A22-SE12-03		○	50	22	40	10.8	3	A	0.3	SEET1203
FMP02-050-A22-SE12-03C	*	○	50	22	40	10.8	3	A	0.3	
FMP02-050-A22-SE12-04		●	50	22	40	10.8	4	A	0.3	
FMP02-050-A22-SE12-04C	*	●	50	22	40	10.8	4	A	0.3	
FMP02-050-A22-SE12-05		●	50	22	40	10.8	5	A	0.2	
FMP02-050-A22-SE12-05C	*	○	50	22	40	10.8	5	A	0.2	
FMP02-063-A22-SE12-04		●	63	22	40	10.8	4	A	0.4	
FMP02-063-A22-SE12-04C	*	○	63	22	40	10.8	4	A	0.4	
FMP02-063-A22-SE12-05		●	63	22	40	10.8	5	A	0.4	
FMP02-063-A22-SE12-05C	*	●	63	22	40	10.8	5	A	0.4	
FMP02-063-A22-SE12-06		●	63	22	40	10.8	6	A	0.4	
FMP02-063-A22-SE12-06C	*	○	63	22	40	10.8	6	A	0.4	
FMP02-080-A27-SE12-04		○	80	27	50	10.8	4	A	0.9	
FMP02-080-A27-SE12-04C	*	○	80	27	50	10.8	4	A	0.9	
FMP02-080-A27-SE12-06		●	80	27	50	10.8	6	A	0.8	
FMP02-080-A27-SE12-06C	*	●	80	27	50	10.8	6	A	0.8	
FMP02-080-A27-SE12-08		●	80	27	50	10.8	8	A	0.8	
FMP02-080-A27-SE12-08C	*	○	80	27	50	10.8	8	A	0.8	

● Ex stock ○ On demand



* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216







Article	*	Stock	Dimensions [mm]				Teeth	Coupling		Inserts 
			∅D	∅d	L	a _{p max}				
FMP02-100-B32-SE12-05		●	100	32	50	10.8	5	B	1.2	
FMP02-100-B32-SE12-05C	*	○	100	32	50	10.8	5	B	1.2	
FMP02-100-B32-SE12-07		●	100	32	50	10.8	7	B	1.2	
FMP02-100-B32-SE12-07C	*	○	100	32	50	10.8	7	B	1.2	
FMP02-100-B32-SE12-10		●	100	32	50	10.8	10	B	1.2	
FMP02-100-B32-SE12-10C	*	○	100	32	50	10.8	10	B	1.2	
FMP02-125-B40-SE12-06		●	125	40	63	10.8	6	B	3.1	
FMP02-125-B40-SE12-06C	*	○	125	40	63	10.8	6	B	3.1	
FMP02-125-B40-SE12-08		●	125	40	63	10.8	8	B	3	
FMP02-125-B40-SE12-08C	*	○	125	40	63	10.8	8	B	3	
FMP02-125-B40-SE12-12		●	125	40	63	10.8	12	B	2.9	
FMP02-125-B40-SE12-12C	*	○	125	40	63	10.8	12	B	2.9	
FMP02-160-C40-SE12-08		●	160	40	63	10.8	8	C	4.1	
FMP02-160-C40-SE12-12		●	160	40	63	10.8	12	C	3.9	
FMP02-200-C60-SE12-16		●	200	60	63	10.8	16	C	6.1	
FMP02-250-C60-SE12-12		○	250	60	63	10.8	12	C	11.1	
FMP02-250-C60-SE12-18		●	250	60	63	10.8	18	C	10.9	
FMP02-315-D60-SE12-24		○	315	60	63	10.8	24	D	21.6	

SEET1203

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ∅D	SEET09T3	SEET1203	SEET1203	
		50-125	50	63-315	
	Screw (insert)	I60M3*7	I60M3.5*10	I60M3.5*12	
	Screw (shim)			SM5*7XA	
	Shim			S12BSX	
	Wrench (insert)	WT09IS	WT15IS	WT15IS	
	Wrench (shim)			WH35L	

System code > B20

Grade selection > B447

Technical info > B22

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- Ideal machining conditions
- ⊕ Normal machining conditions
- ⊗ Unfavourable machining conditions

SEET	L	I.C	S	d
09 T3	9.525	9.525	4.01	3.3
12 03	13.308	13.308	4.04	4.1

Milling inserts

SE** milling insert		HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW								
		P	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕								
		M	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕								
		K	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		N	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		S	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
		H	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗								
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SEET120308-LH	0.8									●	●												●
	SEET09T308PER-PF	0.8													●									
	SEET120308PER-PF	0.8	●	●			○								●									
	SEET09T308PER-PM	0.8							●						●									
	SEET120308PER-PM	0.8	●			●	●	●	●		●				●		●							
	SEET09T308PER-PR	0.8							●								●							
	SEET120308PER-PR	0.8	●			●	●	●	●		○				●		●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

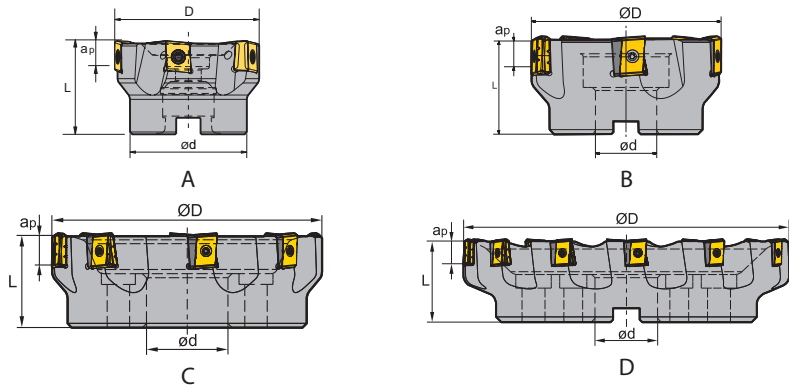
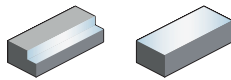
Grade selection > B20

Technical info > B447

Cutting data > B216

Face milling

FMP03 Kr: 89°



Article	*	Stock		Dimensions [mm]				Teeth	Coupling	kg	Inserts
		R	L	ØD	ød	L	ap max				
FMP03-050-A22-LN12-04C	*	●	○	50	22	40	7	4	A	0.3	LNKT120608-ZR
FMP03-050-A22-LN12-05C	*	○	○	50	22	40	7	5	A	0.3	
FMP03-063-A22-LN12-05C	*	●	○	63	22	40	7	5	A	0.5	
FMP03-063-A27-LN12-05C	*	●		63	27	50	7	5	A	0.64	
FMP03-063-A22-LN12-06C	*	●	○	63	22	40	7	6	A	0.5	
FMP03-063-A27-LN12-06C	*	●		63	27	50	7	6	A	0.65	
FMP03-063-A27-LN12-07C	*	●		63	27	50	7	7	A	0.64	
FMP03-080-A27-LN12-06C	*	●	○	80	27	50	7	6	A	1	
FMP03-080-A27-LN12-07C	*	●	○	80	27	50	7	7	A	1	
FMP03-100-B32-LN12-06		●		100	32	50	7	6	B	1.47	
FMP03-125-B40-LN15-06		●	○	125	40	63	12	6	B	3.2	LNKT1506EN-ZR
FMP03-160-C40-LN15-08		●	○	160	40	63	12	8	C	5.1	
FMP03-160-C40-LN15-09		○		160	40	63	12	9	C		
FMP03-200-C60-LN15-10		●	○	200	60	70	12	10	C	7.5	
FMP03-250-C60-LN15-12		○	○	250	60	70	12	12	C	12.2	
FMP03-250-C60-LN15-13		○		250	60	70	12	13	C		
FMP03-315-D60-LN15-16		○	○	315	60	80	12	16	D	23.7	
FMP03-125-B40-LN20-06		●	○	125	40	63	16	6	B	3.3	LNKT2007DN-ZR
FMP03-160-C40-LN20-08		●	○	160	40	63	16	8	C	5.3	
FMP03-160-C40-LN20-09		●		160	40	63	16	9	C		
FMP03-200-C60-LN20-10		●	○	200	60	70	16	10	C	8.8	
FMP03-200-C60-LN20-11		○		200	60	70	16	11	C		
FMP03-250-C60-LN20-12		●	○	250	60	70	16	12	C	14	
FMP03-315-D60-LN20-15		○	○	315	60	80	16	15	D	23.9	
FMP03-125-B40-LN25-05		●	○	125	40	63	20	5	B	3.3	LNKT2510-ZR
FMP03-160-C40-LN25-06		●	○	160	40	63	20	6	C	5.1	
FMP03-200-C60-LN25-08		○	○	200	60	70	20	8	C	8.9	
FMP03-250-C60-LN25-10		●	○	250	60	70	20	10	C	12	
FMP03-315-D60-LN25-12		○	○	315	60	80	20	12	D	21.9	

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

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Spare parts					
Insert	LNKT120608-ZR	LNKT1506EN-ZR	LNKT2007DN-ZR	LNKT2510-ZR	
ØD	50-100	125 - 315	125 - 315	125 - 315	
	Screw (insert)	I60M4*12	I60M4*12	I60M4*15	I60M5*17
	Screw (shim)		I60M3*7	I60M3*7	I60M3.5*10.4
	Shim		LLN15-ZR	LLN20R-ZR	LLN25-ZR
	Wrench (insert)				WT20IT
	Wrench (insert)	WT15IS	WT15IS	WT15IS	
	Wrench (shim)		WT09IS	WT09IS	WT15IS



LNKT	L	S	d
12 06	12.7	6.65	4.4
15 06	15.875	6.35	4.6
20 07	20	7.94	4.6
25 10	25	9.525	5.5

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

LN** milling insert	HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
	P	M	K	N	S	H																	
ISO	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNKT120608-ZR	12	●		●							●											
	LNKT1506EN-ZR	14		●		●	●	●	●								●						
	LNKT2007DN-ZR	17			●		●										●						
	LNKT2510-ZR	18					●										●						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

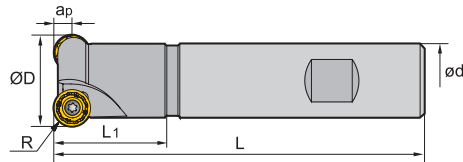
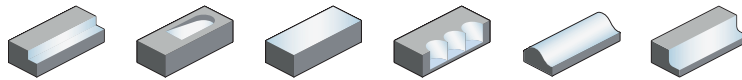
Grade selection > B20

Technical info > B447

Cutting data > B216

Face milling

FMR01




Article	*	Stock	Dimensions [mm]						Teeth	kg	Inserts
			R	ØD	ød	L ₁	L	a _{p max}			
FMR01-025-XP20-RC10-02		●	5	25	20	30	100	5	2	0.2	RCKT10T3
FMR01-025-XP20-RC10-02C	*	●	5	25	20	30	100	5	2	0.2	
FMR01-032-XP25-RC10-02		●	5	32	25	35	120	5	2	0.5	
FMR01-032-XP25-RC10-02C	*	●	5	32	25	35	120	5	2	0.5	
FMR01-040-XP32-RC12-03		●	6	40	32	40	120	6	3	0.7	RCKT1204 RCGX1204
FMR01-040-XP32-RC12-03C	*	●	6	40	32	40	120	6	3	0.7	
FMR01-050-XP32-RC12-03		●	6	50	32	40	120	6	3	0.8	
FMR01-050-XP32-RC12-03C	*	●	6	50	32	40	120	6	3	0.8	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	RCKT10T3	RCKT1204 RCGX1204	
		25-32	40-50	
	Screw (insert)	I60M4*8.4	I60M3.5*10	
	Wrench (insert)	WT15S	WT15S	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



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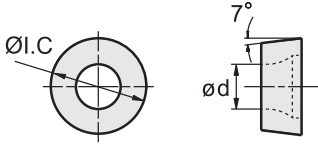

E

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions




RCGX	I.C	S	d
12 04	12	4.76	4

Milling inserts

RC** positive insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RCGX1204MO-LH																						●

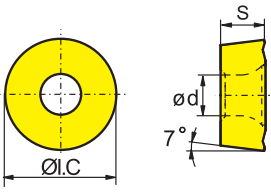





● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

RCKT	I.C	S	d
12 04	12	4.76	4
10 T3	10	3.97	4.4

Milling inserts

RC** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RCKT10T3MO-DM	●	●											●		●							
	RCKT1204MO-DM	●	●		●	●								●		●							
	RCKT1204MO-DR	●	●		●	●						○	○										
	RCKT1204MO-ER				●																		
	RCKT1204MO-NM				●						●			●									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

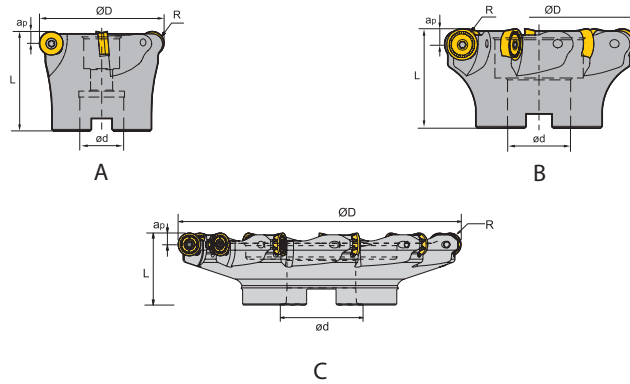
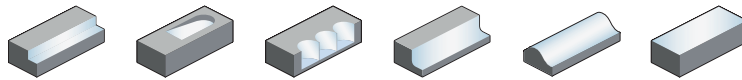
Grade selection > B20

Technical info > B447

Cutting data > B216

Face milling

FMR02



Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts	
			R	ØD	ød	L	ap max					
FMR02-050-A22-RC12-05C	*	●	6	50	22	40	6	5	A	0.7	RCGX1204 RCKT1204 RCMW120	
FMR02-052-A22-RC12-05C	*	●	6	52	22	40	6	5	A	0.7		
FMR02-063-A22-RC12-04		●	6	63	22	40	6	4	A	0.7		
FMR02-063-A22-RC12-04C	*	●	6	63	22	40	6	4	A	0.7		
FMR02-063-A22-RC12-06		●	6	63	22	40	6	6	A	0.7		
FMR02-063-A22-RC12-06C	*	●	6	63	22	40	6	6	A	0.7		
FMR02-080-A27-RC12-07C	*	●	6	80	27	50	6	7	B	0.7		
FMR02-100-B32-RC12-08C	*	●	6	100	32	50	6	8	B	0.89		
FMR02-063-A22-RC16-04		●	8	63	22	40	8	4	A	0.7		RCKT1606
FMR02-063-A22-RC16-04C	*	●	8	63	22	40	8	4	A	0.7		
FMR02-066-A27-RC16-05C	*	●	8	66	27	50	8	4	A	0.5		
FMR02-080-B27-RC16-05		●	8	80	27	50	8	5	B	0.7		
FMR02-080-B27-RC16-05C	*	○	8	80	27	50	8	5	B	0.7		
FMR02-080-B27-RC16-07		●	8	80	27	50	8	7	B	0.7		
FMR02-100-B32-RC16-06		●	8	100	32	63	8	6	B	1.2		
FMR02-100-B32-RC16-06C	*	●	8	100	32	63	8	6	B	1.2		
FMR02-125-B40-RC16-07		●	8	125	40	63	8	7	B	2.5		
FMR02-160-B40-RC16-10(FB)		○	8	160	40	63	8	10	B	3.94		
FMR02-200-C60-RC16-12FB		●	8	200	60	63	8	12	C	5.4		
FMR02-080-A27-RC20-04		●	10	80	27	50	10	4	A	0.7	RCKT2006	
FMR02-080-A27-RC20-04C	*	●	10	80	27	50	10	4	A	0.7		
FMR02-100-B32-RC20-05		●	10	100	32	63	10	5	B	1.2		
FMR02-100-B32-RC20-05C	*	●	10	100	32	63	10	5	B	1.2		
FMR02-100-B32-RC20-06		●	10	100	32	63	10	6	B	1.2		
FMR02-100-B32-RC20-06C	*	●	10	100	32	63	10	6	B	1.2		
FMR02-125-B40-RC20-06		●	10	125	40	63	10	6	B	1.2		
FMR02-125-B40-RC20-06C	*	●	10	125	40	63	10	6	B	1.2		
FMR02-125-B40-RC20-07		●	10	125	40	63	10	7	B	2.2		
FMR02-125-B40-RC20-07C	*	●	10	125	40	63	10	7	B	2.2		
FMR02-160-B40-RC20-08		●	10	160	40	63	10	8	B	4.2		

● Ex stock ○ On demand

* With internal cooling

System code > B22 Grade selection > B20 Technical info > B447 Cutting data > B216



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A

Turning





Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
			R	ØD	ød	L	a _{p max}				
FMR02-160-B40-RC20-08C	*	○	10	160	40	63	10	8	B	4.2	RCKT2006
FMR02-250-C60-RC20-10		●	10	250	60	63	10	10	C	8.49	
FMR02-250-C60-RC20-11		●	10	250	60	63	10	11	C	8.37	

● Ex stock ○ On demand

* With internal cooling




B

Milling

Spare parts					
	Insert	RCGX1204 RCKT1204 RCMW120	RCKT1606	RCKT2006	
	ØD	50-100	63-200	80-250	
	Screw (insert)	I60M3*10	I60M5*13	I43M6*16	
	Wrench (insert)	WT15IS			
	Wrench (insert)		WT20IT	WT25IT	

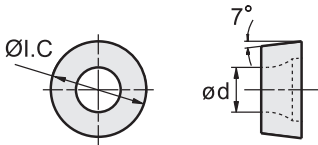




























































C

Drilling

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

RCGX	I.C	S	d
12 04	12	4.76	4

Milling inserts

RC** positive insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RCGX1204MO-LH																					●	

● Ex stock ○ On demand

- HC¹ Coated carbide
- HT Uncoated cermet
- HC² Coated cermet
- HW Uncoated carbide

D

Technical Information

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- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

RCKT	I.C	S	d
12 04	12	4.76	4
20 06	20	6.35	6.55
16 06	16	6.35	5.56

Milling inserts

RC** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO			YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151		YNG151C	YD101	YD201
	RCKT1204MO-DM		●	●		●	●	●						●			●							
	RCKT1606MO-DM		●	●		○							●				●							
	RCKT2006MO-DM		●	○		●																		
	RCKT1204MO-DR		●	●		●	●					○	○											
	RCKT1606MO-DR		●	●		●	●	●				○	○											
	RCKT2006MO-DR		●	●		●	●	●				○	○			●								
	RCKT1204MO-ER					●																		
	RCKT1606MO-ER					●																		
	RCKT2006MO-ER					●																		
	RCKT1204MO-NM					●						●		●										
	RCKT1606MO-NM					●						●		●										

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

RCMW	I.C	S	d
12 04	12	4.76	4.1

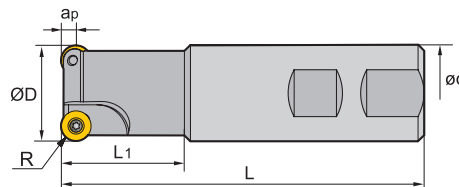
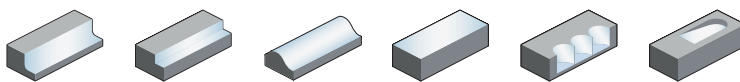
Milling inserts

RN** negative insert			BL (CBN)			BH (CBN)																	
	P																						
	M																						
	K																						
	N																						
	S																						
	H			○																			
ISO		a _{p max}	YCB111	YCB121	YCB131		YCB211																
	RCMW1204MO-PCBN	2.7					○																

● Ex stock ○ On demand

Face milling

FMR03



Article	*	Stock	Dimensions [mm]						Teeth	kg	Inserts
			R	ØD	ød	L ₁	L	a _{p max}			
FMR03-016-XP16-RD08-02		●	4	16	16	25	100	4	2	0.1	RDkW0803
FMR03-016-XP16-RD08-02C	*	○	4	16	16	25	100	4	2	0.1	
FMR03-025-XP25-RD08-02		●	4	25	25	30	100	4	2	0.3	
FMR03-025-XP25-RD08-02C	*	●	4	25	25	30	100	4	2	0.3	
FMR03-032-XP32-RD10-02		●	5	32	32	40	120	5	2	0.7	RDkW10T3
FMR03-032-XP32-RD10-02C	*	●	5	32	32	40	120	5	2	0.7	
FMR03-040-XP32-RD12-03		●	6	40	32	40	120	6	3	0.7	RDkW1204
FMR03-040-XP32-RD12-03C	*	●	6	40	32	40	120	6	3	0.7	
FMR03-050-XP32-RD12-04		●	6	50	32	40	120	6	4	0.8	
FMR03-050-XP32-RD12-04C	*	●	6	50	32	40	120	6	4	0.8	

● Ex stock ○ On demand

* With internal cooling

Spare parts		RDkW0803	RDkW10T3	RDkW1204	
Insert	ØD	16-25	32	40-50	
Screw (insert)		I60M3*7	I60M4*10	I60M4*10	
Wrench (insert)		WT09IP	WT15IP	WT15IP	




System code > B22

Grade selection > B20

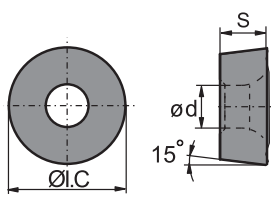

Technical info > B447

Cutting data > B216

RDKW	I.C	S	d
08 03	8	3.18	3.4
10 T3	10	3.97	4.4
12 04	12	4.76	4.4

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

RD** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
	P																					
	M																					
	K																					
	N																					
	S																					
	H																					
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RDKW0803MO																					
	RDKW10T3MO	●	●			○				●				○								
	RDKW1204MO	●				●	●			●	●	●	●	●	●							

● Ex stock ○ On demand

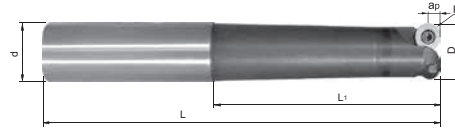
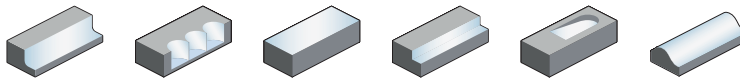
HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Face milling

FMR03



Article	*	Stock	Dimensions [mm]						Teeth	Inserts
			R	ØD	ød	L ₁	L	a _{p max}		
FMR03-015-G16-XS-RD0702-02		●	3.5	15	16	40	88	3.5	2	RDkW0702
FMR03-015-G16-XS-RD0702-02C	*	○	3.5	15	16	40	88	3.5	2	
FMR03-015-G16-S-RD0702-02		●	3.5	15	16	60	108	3.5	2	
FMR03-015-G16-S-RD0702-02C	*	○	3.5	15	16	60	108	3.5	2	
FMR03-015-G20-M-RD0702-02		●	3.5	15	20	80	130	3.5	2	
FMR03-015-G20-M-RD0702-02C	*	○	3.5	15	20	80	130	3.5	2	
FMR03-015-G20-L-RD0702-02		○	3.5	15	20	100	150	3.5	2	
FMR03-015-G20-L-RD0702-02C	*	○	3.5	15	20	100	150	3.5	2	
FMR03-015-G25-XL-RD0702-02		●	3.5	15	25	120	176	3.5	2	
FMR03-015-G25-XL-RD0702-02C	*	○	3.5	15	25	120	176	3.5	2	
FMR03-020-G20-XS-RD1003-02		○	5	20	20	40	90	5	2	RDkW1003
FMR03-020-G20-XS-RD1003-02C	*	○	5	20	20	40	90	5	2	
FMR03-020-G20-S-RD1003-02		●	5	20	20	60	110	5	2	
FMR03-020-G20-S-RD1003-02C	*	○	5	20	20	60	110	5	2	
FMR03-020-G25-M-RD1003-02		●	5	20	25	80	136	5	2	
FMR03-020-G25-M-RD1003-02C	*	○	5	20	25	80	136	5	2	
FMR03-020-G25-L-RD1003-02		●	5	20	25	100	156	5	2	
FMR03-020-G25-L-RD1003-02C	*	○	5	20	25	100	156	5	2	
FMR03-020-G25-XL-RD1003-02		●	5	20	25	120	176	5	2	
FMR03-020-G25-XL-RD1003-02C	*	○	5	20	25	120	176	5	2	

● Ex stock ○ On demand

* With internal cooling



System code > B22

Grade selection > B20

Technical info > B447




Cutting data > B216

Spare parts

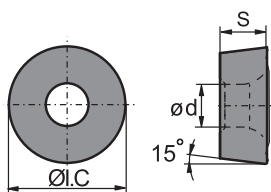

Insert		RDKW0702	RDKW1003
ØD		15	20
	Screw (insert)	I60M2.5*5.0	I60M3.5*7.7
	Wrench (insert)	WT07P	WT15P



Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

RDKW	I.C	S	d
07 02	7	2.38	2.7
10 03	10	3.18	3.9

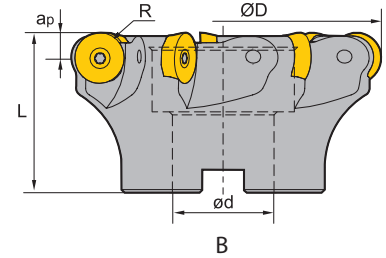
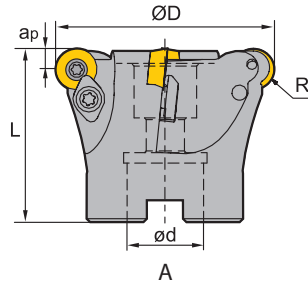
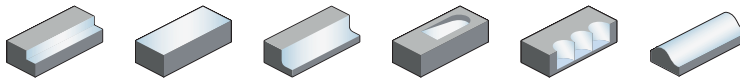
RD** milling insert		HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW										
		P	M	K	N	S	H	P	M	K	N	S	H											
																								
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
	RDKW0702MO-1																							
	RDKW0702MO-2																							
	RDKW1003MO-1																							
	RDKW1003MO-2																							
	RDKW1003MO-3																							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Face milling

FMR04



Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
			R	ØD	ød	L	a _{p max}				
FMR04-050-A22-RD12-03		●	6	50	22	40	6	3	A	0.3	RDKW1204
FMR04-050-A22-RD12-03C	*	●	6	50	22	40	6	3	A	0.3	
FMR04-063-A22-RD12-04		●	6	63	22	50	6	4	A	0.5	
FMR04-063-A22-RD12-04C	*	●	6	63	22	50	6	4	A	0.5	RDKW1605
FMR04-080-B27-RD16-05		●	8	80	27	50	8	5	B	1.2	
FMR04-080-B27-RD16-05C	*	●	8	80	27	50	8	5	B	1.2	
FMR04-100-B32-RD16-06		●	8	100	32	50	8	6	B	1	RDKW2006
FMR04-100-B32-RD16-06C	*	●	8	100	32	50	8	6	B	1	
FMR04-125-B40-RD20-06		○	10	125	40	63	10	6	B	1.9	
FMR04-125-B40-RD20-06C	*	○	10	125	40	63	10	6	B	1.9	RDKW2006
FMR04-160-B40-RD20-07		○	10	160	40	63	10	7	B	3.7	
FMR04-160-B40-RD20-07C	*	○	10	160	40	63	10	7	B	3.7	

● Ex stock ○ On demand

* With internal cooling

Spare parts		RDKW1204	RDKW1605	RDKW2006
	Insert	RDKW1204	RDKW1605	RDKW2006
	ØD	50-63	80-100	125-160
	Clamp	WD-204	WD-207	
	Screw (clamp)	I60M4*10	I60M5*13	
	Screw (insert)	I60M3.5*10	I60M5*13	I43M6*16
	Wrench (clamp)	WT15IP		
	Wrench (clamp)		WT20IT	
	Wrench (insert)	WT15IP		
	Wrench (insert)		WT20IT	WT25IT






System code > B22

Grade selection > B20

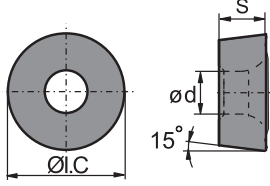


Technical info > B447

Cutting data > B216

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

RDKW	I.C	S	d
12 04	12	4.76	4.4
16 05	16	5.56	5.5
20 06	20	6.35	6.5

RD** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
		P	M	K	N	S	H	P	M	K	N	S	H										
																							
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RDKW1204MO	●			●	●				●	●	●	●	●	●	●							
	RDKW1605MO				●	●							●	○	●								
	RDKW2006MO	○			●	●		○															
	RDKW2006MO-3											●											

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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System code > B22

Grade selection > B20

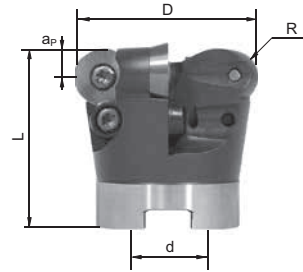
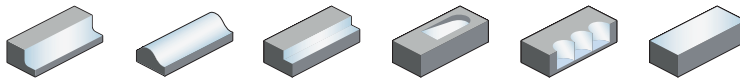
Technical info > B447

Cutting data > B216



Face milling

FMR04



Article	*	Stock	Dimensions [mm]					Teeth	Inserts
			R	ØD	ød	L	a _p max		
FMR04-042-A16-RD1003-06		●	5	42	16	44	5	6	RDKW1003
FMR04-042-A16-RD1003-06C	*	●	5	42	16	44	5	6	
FMR04-052-A22-RD1003-06		○	5	52	22	50	5	6	
FMR04-052-A22-RD1003-07		●	5	52	22	50	5	7	
FMR04-052-A22-RD1003-07C	*	●	5	52	22	50	5	7	RDKW12T3
FMR04-042-A16-RD12T3-05		●	6	42	16	42	6	5	
FMR04-042-A16-RD12T3-05C	*	●	6	42	16	42	6	5	
FMR04-052-A22-RD12T3-05		●	6	52	22	50	6	5	
FMR04-052-A22-RD12T3-05C	*	●	6	52	22	50	6	5	
FMR04-066-A27-RD12T3-06		●	6	66	27	50	6	6	
FMR04-066-A27-RD12T3-06C	*	●	6	66	27	50	6	6	RDKW1604
FMR04-080-A27-RD12T3-07		●	6	80	27	50	6	7	
FMR04-080-A27-RD12T3-07C	*	●	6	80	27	50	6	7	
FMR04-052-A22-RD1604-04		●	8	52	22	50	8	4	
FMR04-052-A22-RD1604-04C	*	●	8	52	22	50	8	4	RDKW1604
FMR04-052-A22-RD1604-05		○	8	52	22	50	8	5	
FMR04-052-A22-RD1604-05C	*	●	8	52	22	50	8	5	
FMR04-066-A27-RD1604-05		●	8	66	27	50	8	5	
FMR04-066-A27-RD1604-05C	*	●	8	66	27	50	8	5	
FMR04-080-A27-RD1604-06		●	8	80	27	52	8	6	
FMR04-080-A27-RD1604-06C	*	●	8	80	27	52	8	6	
FMR04-100-B32-RD1604-07		●	8	100	32	52	8	7	
FMR04-100-B32-RD1604-07C	*	●	8	100	32	52	8	7	
FMR04-125-B40-RD1604-08		●	8	125	40	52	8	8	
FMR04-125-B40-RD1604-08C	*	●	8	125	40	52	8	8	
FMR04-160-B40-RD1604-09		●	8	160	40	52	8	9	
FMR04-160-B40-RD1604-09C	*	○	8	160	40	52	8	9	

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

Spare parts						
	Insert	RDkW1003	RDkW12T3	RDkW12T3	RDkW1604	RDkW1604
	ØD	42-52	42	52-80	52	66-160
	Clamp					WX16N
	Clamp			LOM3.5*7.1		
	Screw (clamp)					I60M4.5*10
	Screw (insert)	I60M3.5*7.7	I60M3.5*7.7	I60M3.5*7.7	I60M4.5*10	I60M4.5*10
	Wrench (clamp)					WT20T
	Wrench (clamp)			WT15P		
	Wrench (insert)				WT20T	WT20T
	Wrench (insert)	WT15P	WT15P	WT15P		

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

RDkW	I.C	S	d
10 03	10	3.18	3.9
12 T3	12	3.97	3.9
16 04	16	4.76	5.2

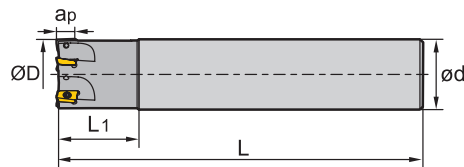
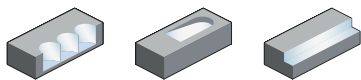
RD** milling insert		HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW									
		P	M	K	N	S	H	P	M	K	N	S	H										
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RDkW1003MO-1				●	●						●	●	●									
	RDkW1003MO-2									●													
	RDkW1003MO-3				●								●										
	RDkW12T3MO-1				●	●						●	●	●									
	RDkW12T3MO-2										●		○									●	
	RDkW12T3MO-3				●								●										
	RDkW1604MO-1						●	●				●	●	●		●							
	RDkW1604MO-2										●												
RDkW1604MO-3		●	●		●				●	○		●			●								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Square shoulder milling

EMP01 Kr: 90°



Straight shank

Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	ød	L ₁	L	a _{p max}			
EMP01-012-G16-AP11-01		●	12	16	25	85	10.5	1	0.1	APKT11T3
EMP01-012-G16-AP11-01C	*	○	12	16	25	85	10.5	1	0.1	
EMP01-016-G16-AP11-02		●	16	16	25	90	10.5	2	0.1	
EMP01-016-G16-AP11-02C	*	●	16	16	25	90	10.5	2	0.1	
EMP01-020-G20-AP11-02		●	20	20	30	100	10.5	2	0.2	
EMP01-020-G20-AP11-02C	*	●	20	20	30	100	10.5	2	0.2	
EMP01-020-G20-AP11-03		●	20	20	30	100	10.5	3	0.2	
EMP01-020-G20-AP11-03C	*	●	20	20	30	100	10.5	3	0.2	
EMP01-025-G25-AP11-03		●	25	25	35	115	10.5	3	0.4	
EMP01-025-G25-AP11-03C	*	○	25	25	35	115	10.5	3	0.4	
EMP01-025-G25-AP11-04		●	25	25	35	115	10.5	4	0.4	
EMP01-025-G25-AP11-04C	*	●	25	25	35	115	10.5	4	0.4	
EMP01-032-G32-AP11-04		●	32	32	40	125	10.5	4	0.7	APKT1604
EMP01-032-G32-AP11-04C	*	○	32	32	40	125	10.5	4	0.7	
EMP01-025-G25-AP16-02		●	25	25	35	115	15.5	2	0.4	
EMP01-025-G25-AP16-02C	*	●	25	25	35	115	15.5	2	0.4	
EMP01-032-G32-AP16-03		●	32	32	40	125	15.5	3	0.7	
EMP01-032-G32-AP16-03C	*	●	32	32	40	125	15.5	3	0.7	
EMP01-040-G32-AP16-03		●	40	32	42	130	15.5	3	0.7	
EMP01-040-G32-AP16-03C	*	●	40	32	42	130	15.5	3	0.7	
EMP01-040-G32-AP16-04		●	40	32	42	130	15.5	4	0.8	
EMP01-040-G32-AP16-04C	*	●	40	32	42	130	15.5	4	0.8	
EMP01-050-G32-AP16-05		●	50	32	45	135	15.5	5	1	
EMP01-050-G32-AP16-05C	*	○	50	32	45	135	15.5	5	1	
EMP01-063-G32-AP16-06		●	63	32	45	135	15.5	6	1.4	
EMP01-063-G32-AP16-06C	*	○	63	32	45	135	15.5	6	1.4	

● Ex stock ○ On demand

* With internal cooling





System code > B22


Grade selection > B20

Technical info > B447




Cutting data > B216

Spare parts

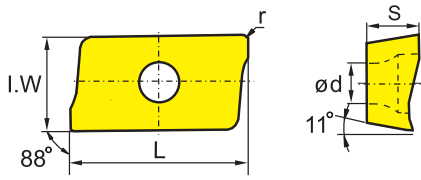




	Insert	APKT11T3 12-32	APKT1604 25-63
	Screw (insert)	I60M2.5*6.5T	
	Screw (insert)		I60M4*8.4
	Wrench (insert)	WT08IP	
	Wrench (insert)		WT15S



Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

AP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
		P	M	K	N	S	H																		
																									
	ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	APKT11T304-ALH	0.4	6.5									●												●	●
	APKT11T308-ALH	0.8	6.5									●												●	●
	APKT160408-ALH	0.8	9.33									●												●	●
	APKT11T304-APF	0.4	6.5											●											
	APKT11T308-APF	0.8	6.5											●											
	APKT160408-APF	0.8	9.33											●	○		○								
	APKT11T304-APM	0.4	6.5				●			●				●											
	APKT11T308-APM	0.8	6.5				●			●				●											
	APKT11T312-APM	1.2	6.5				●			●				●											
	APKT11T316-APM	1.6	6.5				●			●				●											
	APKT11T320-APM	2	6.5				●			●				●											
	APKT160408-APM	0.8	9.33				●			●	●			●											
	APKT160416-APM	1.6	9.33				●			●				●											
	APKT160420-APM	2	9.33				●			●				●											
	APKT160424-APM	2.4	9.33				●			●				●											
	APKT160430-APM	3	9.33				●			●				●											
	APKT11T304-LH	0.4	6.5																					●	●
	APKT11T308-LH	0.8	6.5																					●	●
	APKT160408-LH	0.8	9.33																					●	●

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



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Indexable milling Square shoulder milling

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- Ideal machining conditions
- ⊕ Normal machining conditions
- ⊗ Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

Milling inserts

AP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW								
				P	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
				M	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
				K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
				N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
				S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
				H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
ISO	r	I.W		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
	APKT11T304-PF	0.4	6.5	○				●					●			●										
	APKT11T308-PF	0.8	6.5					○					○			●										
	APKT11T312-PF	1.2	6.5													○										
	APKT11T316-PF	1.6	6.5													○										
	APKT160408-PF	0.8	9.33		●				○	●							●			●						
	APKT160430-PF	3	9.33	○																						
	APKT11T304-PM	0.4	6.5	●	●	●		●	●				○			●			●							
	APKT11T308-PM	0.8	6.5	●	●		●	●	●	●	●		●	●	●	●	●		●							
	APKT11T312-PM	1.2	6.5					○					○			●		○								
	APKT11T316-PM	1.6	6.5						●				○			●		○								
	APKT160408-PM	0.8	9.33	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	APKT160416-PM	1.6	9.33	○													●									
	APKT11T304-PR	0.4	6.5							○						○		○								
	APKT11T308-PR	0.8	6.5															○								
	APKT11T312-PR	1.2	6.5															○								
	APKT11T316-PR	1.6	6.5															○								
	APKT160408-PR	0.8	9.33															○								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

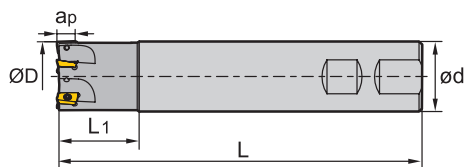
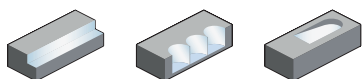
Technical info > B447

Cutting data > B216



Square shoulder milling

EMP01 Kr: 90°



Weldon shank

Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			øD	ød	L ₁	L	a _{p max}			
EMP01-012-XP16-AP11-01		●	12	16	25	85	10.5	1	0.1	APKT11T3
EMP01-012-XP16-AP11-01C	*	○	12	16	25	85	10.5	1	0.1	
EMP01-016-XP16-AP11-02		●	16	16	25	90	10.5	2	0.1	
EMP01-016-XP16-AP11-02C	*	●	16	16	25	90	10.5	2	0.1	
EMP01-020-XP20-AP11-02		●	20	20	30	100	10.5	2	0.2	
EMP01-020-XP20-AP11-02C	*	●	20	20	30	100	10.5	2	0.2	
EMP01-020-XP20-AP11-03		●	20	20	30	100	10.5	3	0.2	
EMP01-020-XP20-AP11-03C	*	●	20	20	30	100	10.5	3	0.2	
EMP01-025-XP25-AP11-03		●	25	25	35	115	10.5	3	0.4	
EMP01-025-XP25-AP11-03C	*	●	25	25	35	115	10.5	3	0.4	
EMP01-025-XP25-AP11-04		●	25	25	35	115	10.5	4	0.4	
EMP01-025-XP25-AP11-04C	*	●	25	25	35	115	10.5	4	0.4	
EMP01-032-XP32-AP11-04		●	32	32	40	125	10.5	4	0.7	
EMP01-032-XP32-AP11-04C	*	○	32	32	40	125	10.5	4	0.7	
EMP01-025-XP25-AP16-02		●	25	25	35	115	15.5	2	0.4	APKT1604
EMP01-025-XP25-AP16-02C	*	●	25	25	35	115	15.5	2	0.4	
EMP01-032-XP32-AP16-03		●	32	32	40	125	15.5	3	0.7	
EMP01-032-XP32-AP16-03C	*	●	32	32	40	125	15.5	3	0.7	
EMP01-040-XP32-AP16-04		●	40	32	42	130	15.5	4	0.8	
EMP01-040-XP32-AP16-04C	*	●	40	32	42	130	15.5	4	0.8	
EMP01-050-XP32-AP16-05		●	50	32	45	135	15.5	5	1	
EMP01-050-XP32-AP16-05C	*	●	50	32	45	135	15.5	5	1	
EMP01-063-XP32-AP16-06		○	63	32	45	135	15.5	6	1.4	
EMP01-063-XP32-AP16-06C	*	○	63	32	45	135	15.5	6	1.4	

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447


Cutting data > B216



Indexable milling Square shoulder milling

Spare parts

	Insert	APKT11T3	APKT1604
	ØD	12-32	25-63
	Screw (insert)	I60M2.5*6.5T	I60M4*8.4
	Screw (insert)		
	Wrench (insert)	WT15S	
	Wrench (insert)	WT08IP	



Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

AP** milling insert		HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW							
		P	M	K	N	S	H																
ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	0.4	6.5									●											●	●
	0.8	6.5									●											●	●
	0.8	9.33									●											●	●
	0.4	6.5										●											
	0.8	6.5										●											
	0.8	9.33										●	○	○									
	0.4	6.5				●		●				●											
	0.8	6.5				●		●				●											
	1.2	6.5				●		●				●											
	1.6	6.5				●		●				●											
	2	6.5				●		●				●											
	0.8	9.33				●		●	●			●											
	1.6	9.33				●		●				●											
	2	9.33				●		●				●											
	2.4	9.33				●		●				●											
	3	9.33				●		●				●											
	0.4	6.5																				●	●
	0.8	6.5																				●	●
	0.8	9.33																				●	●

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

AP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW										
	P	M	K	N	S	H																					
	ISO			r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
		APKT11T304-PF	0.4	6.5	○	●									●												
		APKT11T308-PF	0.8	6.5											○												
		APKT11T312-PF	1.2	6.5															○								
		APKT11T316-PF	1.6	6.5															○								
APKT160408-PF		0.8	9.33	●		○	●													●	●						
APKT160430-PF		3	9.33	○																							
	APKT11T304-PM	0.4	6.5	●	●	●	●	●	●	●	●	●	●	○		●	●	●	●	●	●	●	●	●	●	●	
	APKT11T308-PM	0.8	6.5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	APKT11T312-PM	1.2	6.5											○		●	●	○									
	APKT11T316-PM	1.6	6.5											○		●	●	○									
	APKT160408-PM	0.8	9.33	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	APKT160416-PM	1.6	9.33	○																●							
	APKT11T304-PR	0.4	6.5																								
	APKT11T308-PR	0.8	6.5																								
	APKT11T312-PR	1.2	6.5																								
	APKT11T316-PR	1.6	6.5																								
	APKT160408-PR	0.8	9.33																								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

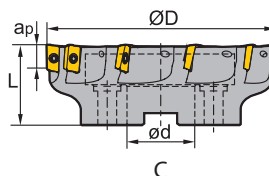
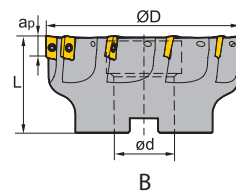
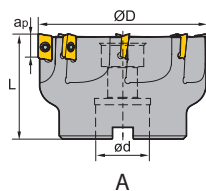
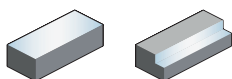
Cutting data > B216



A Turning
 B Milling
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 E Index

Square shoulder milling

EMP02 Kr: 90°



Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts
			ØD	ød	L	a _{p max}				
EMP02-040-A16-AP11-04C	*	●	40	16	40	11	4	A	0.237	APKT11T3
EMP02-040-A16-AP11-05C	*	●	40	16	40	11	5	A	0.177	
EMP02-050-A22-AP11-06		●	50	22	40	11	6	A	0.3	
EMP02-050-A22-AP11-06C	*	●	50	22	40	11	6	A	0.3	
EMP02-050-A22-AP11-07C	*	●	50	22	40	11	7	A	0.39	
EMP02-063-A22-AP11-08		●	63	22	40	11	8	A	0.6	
EMP02-063-A22-AP11-08C	*	●	63	22	40	11	8	A	0.6	
EMP02-063-A22-AP11-09C	*	●	63	22	40	11	9	A	0.54	
EMP02-080-A27-AP11-08		●	80	27	50	11	8	A	1.2	
EMP02-080-A27-AP11-08C	*	●	80	27	50	11	8	A	1.2	
EMP02-080-A27-AP11-10C	*	●	80	27	50	11	10	A	1.13	
EMP02-100-B32-AP11-10		●	100	32	50	11	10	B	1.7	
EMP02-100-B32-AP11-10C	*	○	100	32	50	11	10	B	1.7	
EMP02-125-B40-AP11-10		●	125	40	63	11	10	B	3.42	
EMP02-040-A16-AP16-03		●	40	16	40	15.5	3	A	0.17	APKT1604
EMP02-040-A16-AP16-04C	*	●	40	16	40	15.5	4	A	0.17	
EMP02-050-A22-AP16-05		●	50	22	40	15.5	5	A	0.3	
EMP02-050-A22-AP16-05C	*	●	50	22	40	15.5	5	A	0.3	
EMP02-063-A22-AP16-06		●	63	22	40	15.5	6	A	0.5	
EMP02-063-A22-AP16-06C	*	●	63	22	40	15.5	6	A	0.5	
EMP02-080-A27-AP16-06C	*	●	80	27	50	15.5	6	A	1.08	
EMP02-080-A27-AP16-07		●	80	27	50	15.5	7	A	1.1	
EMP02-080-A27-AP16-07C	*	●	80	27	50	15.5	7	A	1.1	
EMP02-100-B32-AP16-08		●	100	32	50	15.5	8	B	1.6	
EMP02-100-B32-AP16-08C	*	●	100	32	50	15.5	8	B	1.6	
EMP02-125-B40-AP16-06C	*	●	125	40	63	15.5	6	B	3.18	
EMP02-125-B40-AP16-10		●	125	40	63	15.5	10	B	3.2	
EMP02-125-B40-AP16-10C	*	●	125	40	63	15.5	10	B	3.2	
EMP02-160-B40-AP16-07C	*	●	160	40	63	15.5	7	B	4.3	
EMP02-160-B40-AP16-10		●	160	40	63	15.5	10	B	6.3	

● Ex stock ○ On demand


* With internal cooling

System code > B22

Grade selection > B20





Technical info > B447

Cutting data > B216




Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts 
			ØD	ød	L	a _p max				
EMP02-160-B40-AP16-10C	*	○	160	40	63	15.5	10	B	6.3	
EMP02-200-C60-AP16-12		○	200	60	63	15.5	12	C	8.1	APKT1604
EMP02-250-C60-AP16-12		○	250	60	63	15.5	12	C	11.2	

● Ex stock ○ On demand

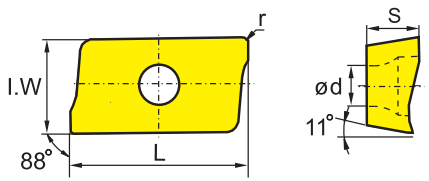

















* With internal cooling

Spare parts			
Insert	APKT11T3 40-125	APKT1604 40-250	
ØD			
 Screw (insert)		I60M4*10	
 Screw (insert)	I60M2.5*6.5T		
 Wrench (insert)	WT08IS	WT15IS	

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

AP** milling insert				HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW							
		P	M	K	N	S	H																
																							
ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	APKT11T304-ALH	0.4	6.5								●											●	●
	APKT11T308-ALH	0.8	6.5								●											●	●
	APKT160408-ALH	0.8	9.33								●											●	●
	APKT11T304-APF	0.4	6.5									●											
	APKT11T308-APF	0.8	6.5									●											
	APKT160408-APF	0.8	9.33									●		○		○							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Indexable milling Square shoulder milling

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

Milling inserts

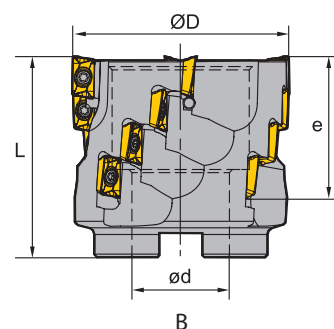
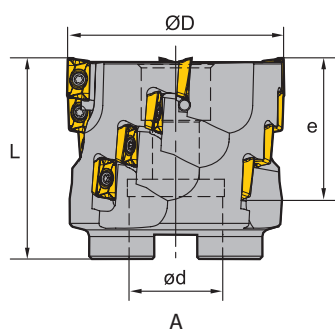
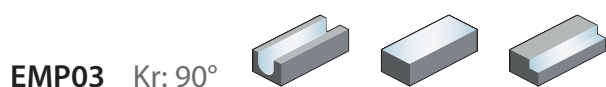
AP** milling insert			HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW								
	P	M	K	N	S	H																			
	ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
		APKT11T304-APM	0.4	6.5				●		●															
		APKT11T308-APM	0.8	6.5				●		●															
		APKT11T312-APM	1.2	6.5				●		●															
		APKT11T316-APM	1.6	6.5				●		●															
	APKT11T320-APM	2	6.5				●		●																
	APKT160408-APM	0.8	9.33				●		●	●															
	APKT160416-APM	1.6	9.33				●		●																
	APKT160420-APM	2	9.33				●		●																
	APKT160424-APM	2.4	9.33				●		●																
	APKT160430-APM	3	9.33				●		●																
	APKT11T304-LH	0.4	6.5																				●	●	
	APKT11T308-LH	0.8	6.5																				●	●	
	APKT160408-LH	0.8	9.33																				●	●	
	APKT11T304-PF	0.4	6.5				○		●			●		●		●									
	APKT11T308-PF	0.8	6.5						○			○		●											
	APKT11T312-PF	1.2	6.5											○											
	APKT11T316-PF	1.6	6.5											○											
	APKT160408-PF	0.8	9.33				●		○	●				●		●									
	APKT160430-PF	3	9.33				○																		
	APKT11T304-PM	0.4	6.5				●	●	●	●	●	○		●		●									
	APKT11T308-PM	0.8	6.5				●	●	●	●	●	●	●	●	●	●									
	APKT11T312-PM	1.2	6.5						○			○		●		○									
	APKT11T316-PM	1.6	6.5						●			○		●		○									
	APKT160408-PM	0.8	9.33				●	●	●	●	●	●	●	●	●	●									
	APKT160416-PM	1.6	9.33				○							●											
	APKT11T304-PR	0.4	6.5						○					○		○									
	APKT11T308-PR	0.8	6.5													○									
	APKT11T312-PR	1.2	6.5													○									
	APKT11T316-PR	1.6	6.5													○									
	APKT160408-PR	0.8	9.33													○									


● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



Square shoulder milling

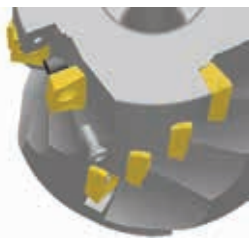




Article	*	Stock	Dimensions [mm]				Teeth	Coupling	No. of inserts	kg	Inserts
			ØD	e	ød	L					
EMP03-050-A22-AP11-04		●	50	39	22	58	4	A	16	0.5	 APKT11T3
EMP03-050-A22-AP11-04C	*	○	50	39	22	58	4	A	16	0.5	
EMP03-063-A27-AP11-04		●	63	39	27	58	4	A	16	0.9	
EMP03-080-B32-AP11-05		●	80	39	32	63	5	B	20	1.3	
EMP03-080-B32-AP11-05C	*	○	80	39	32	63	5	B	20	1.3	
EMP03-100-B40-AP11-06		●	100	39	40	63	6	B	24	2	
EMP03-100-B40-AP11-06C	*	○	100	39	40	63	6	B	24	2	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	APKT11T3 50-100	
	Screw (insert)	I60M2.5*6.5T	
	Wrench (insert)	WT08IS	

Indexable milling Square shoulder milling

A

Turning

B

Milling

C




Drilling

D

Technical Information

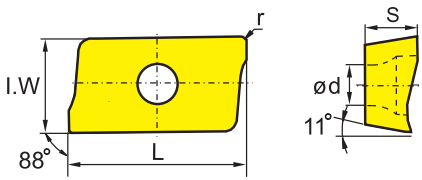







E

Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8

Milling inserts

AP** milling insert			HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW								
	P	M	K	N	S	H																			
	ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
		APKT11T304-ALH	0.4	6.5									●											●	●
		APKT11T308-ALH	0.8	6.5									●											●	●
		APKT11T304-APF	0.4	6.5										●											
		APKT11T308-APF	0.8	6.5										●											
	APKT11T304-APM	0.4	6.5				●		●				●												
	APKT11T308-APM	0.8	6.5				●		●				●												
	APKT11T312-APM	1.2	6.5				●		●				●												
	APKT11T316-APM	1.6	6.5				●		●				●												
	APKT11T320-APM	2	6.5				●		●				●												
	APKT11T304-LH	0.4	6.5																				●	●	
	APKT11T308-LH	0.8	6.5																				●	●	
	APKT11T304-PF	0.4	6.5	○			●					●		●		●									
	APKT11T308-PF	0.8	6.5				○					○		●											
	APKT11T312-PF	1.2	6.5											○											
	APKT11T316-PF	1.6	6.5											○											
	APKT11T304-PM	0.4	6.5	●	●	●	●	●	●			○		●		●									
	APKT11T308-PM	0.8	6.5	●	●	●	●	●	●	●		●		●		●									
	APKT11T312-PM	1.2	6.5				○					○		●		○									
	APKT11T316-PM	1.6	6.5				●					○		●		○									
	APKT11T304-PR	0.4	6.5					○						○		○									
	APKT11T308-PR	0.8	6.5													○									
	APKT11T312-PR	1.2	6.5													○									
	APKT11T316-PR	1.6	6.5													○									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

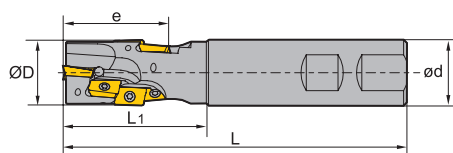
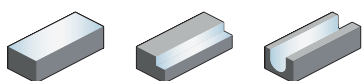
Technical info > B447

Cutting data > B216




Square shoulder milling

EMP04 Kr: 90°






Weldon shank

Article	* Stock	Dimensions [mm]					Teeth	No. of inserts	kg	Inserts
		ØD	e	ød	L ₁	L				
EMP04-020-XP20-AP11-01	●	20	29.4	20	45	120	1	3	0.3	 APKT11T3
EMP04-025-XP25-AP11-02	●	25	38.9	25	55	130	2	8	0.4	
EMP04-032-XP32-AP11-02	●	32	48.5	32	65	140	2	10	0.7	
EMP04-040-XP40-AP11-02	●	40	58	40	75	150	2	14	1.3	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	APKT11T3 20-40	
	Screw (insert)	I60M2.5*6.5T	
	Wrench (insert)	WT08IS	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



Indexable milling Square shoulder milling

A

Turning

B

Milling

C




Drilling

D

Technical Information

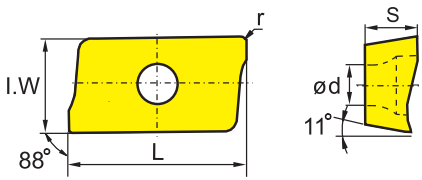







E

Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8

Milling inserts

AP** milling insert			HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW								
	P	M	K	N	S	H																			
	ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
		APKT11T304-ALH	0.4	6.5									●											●	●
		APKT11T308-ALH	0.8	6.5									●											●	●
		APKT11T304-APF	0.4	6.5										●											
		APKT11T308-APF	0.8	6.5										●											
	APKT11T304-APM	0.4	6.5				●		●				●												
	APKT11T308-APM	0.8	6.5				●		●				●												
	APKT11T312-APM	1.2	6.5				●		●				●												
	APKT11T316-APM	1.6	6.5				●		●				●												
	APKT11T320-APM	2	6.5				●		●				●												
	APKT11T304-LH	0.4	6.5																				●	●	
	APKT11T308-LH	0.8	6.5																				●	●	
	APKT11T304-PF	0.4	6.5	○			●					●		●		●									
	APKT11T308-PF	0.8	6.5				○					○		●											
	APKT11T312-PF	1.2	6.5											○											
	APKT11T316-PF	1.6	6.5											○											
	APKT11T304-PM	0.4	6.5	●	●	●	●	●	●			○		●		●									
	APKT11T308-PM	0.8	6.5	●	●	●	●	●	●	●		●		●		●									
	APKT11T312-PM	1.2	6.5				○					○		●		○									
	APKT11T316-PM	1.6	6.5				●					○		●		○									
	APKT11T304-PR	0.4	6.5					○						○		○									
	APKT11T308-PR	0.8	6.5													○									
	APKT11T312-PR	1.2	6.5													○									
	APKT11T316-PR	1.6	6.5													○									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

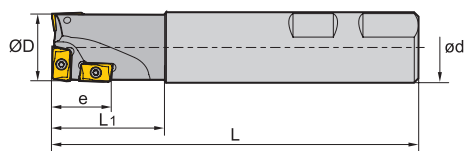
Grade selection > B20

Technical info > B447

Cutting data > B216

Square shoulder milling

EMP05 Kr: 90°



Weldon shank

Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	e	ød	L ₁	L			
EMP05-025-XP25C		●	25	20	25	40	130	3	0.5	APMT1135
EMP05-025-XP25		●	25	20	25	40	130	3	0.5	
EMP05-032-XP32		●	32	30	32	50	140	3	0.8	APMT1604
EMP05-032-XP32C		●	32	30	32	50	140	3	0.8	
EMP05-040-XP32		●	40	40	32	60	150	4	1	
EMP05-040-XP32C		●	40	40	32	60	150	4	1	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	APMT1135	APMT1604	
	ØD	25	32-40	
	Screw (insert)		I60M4*10	
	Screw (insert)	I60M2.5*6.5T		
	Wrench (insert)	WT08IP	WT15IP	

Indexable milling Square shoulder milling

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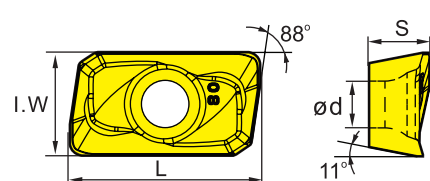

































































































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Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APMT	L	S	d
11 35	11.25	3.5	2.8
16 04	17.25	4.76	4.4

Milling inserts

AN** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW						
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	APMT1135PDR	0.8	6.2				○							●	○	○								
	APMT160408PDER	0.8	9.25				○							●	○	●								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216





EMP09 *Kr: 90°*

Square shoulder mill with tangential inserts

- Sharp cutting edge geometry combined with robust tangential inserts.
- First choice for large cutting depths with high feed rates.
- Very good competitiveness.

Insert grades

YBG253

CVD
P20-P40
M10-M30

YBG9320

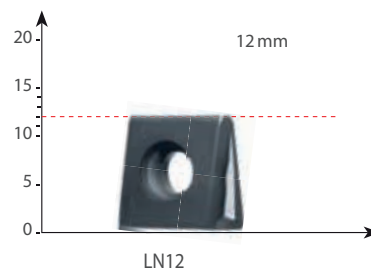
PVD
P10-P30
M20-M30

YBD252

CVD
K15-K35

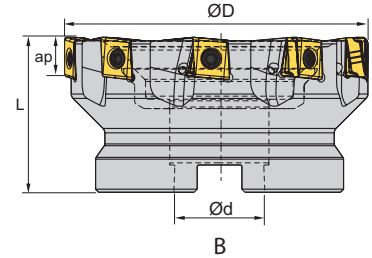
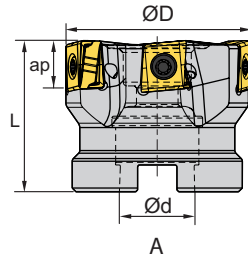
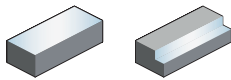
Chip breaker

-GM



Square shoulder milling

EMP09





Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts
			ØD	ød	L	a _{p max}				
EMP09-040-A16-LN12-04C	*	●	40	16	40	11.5	4	A	0.19	LNKT1206PNR-GM
EMP09-050-A22-LN12-05C	*	●	50	22	40	11.5	5	A	0.33	
EMP09-063-A22-LN12-06C	*	●	63	22	40	11.5	6	A	0.53	
EMP09-080-A27-LN12-07C	*	●	80	27	50	11.5	7	A	1.18	
EMP09-100-B32-LN12-09C	*	●	100	32	50	11.5	9	B	1.62	
EMP09-125-B40-LN12-11C	*	●	125	40	63	11.5	11	B	3.25	

● Ex stock ○ On demand

* With internal cooling

Spare parts




	Insert	LNKT1206PNR-GM
	ØD	40-125
	Screw (clamp)	I60M4*12
	Wrench	WT15IS

System code > B22

Grade selection > B20

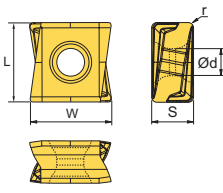

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

LNKT	L	S
12 06	12.7	11.25

Milling inserts

LN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW								
	P	M	K	N	S	H																			
	ISO		W	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
		LNKT120608PNR-GM		6.75	0.8			●				●			●										

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Technical Information

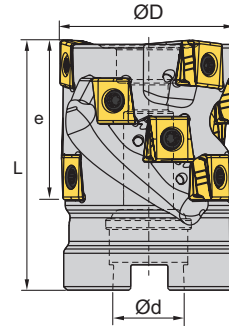
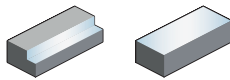
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Square shoulder milling



EMP09 Kr: 90°



Article	*	Stock	Dimensions [mm]				Teeth row	Teeth	Coupling	kg	Inserts
			ØD	e	ød	L					
EMP09-040x43-A16-LN12-02C	*	○	40	43	16	70	2	8	A	0,4	LNKT1206PNR-GM
EMP09-050x43-A22-LN12-03C	*	●	50	43	22	70	3	12	A	0,64	
EMP09-063x53-A27-LN12-04C	*	○	63	53	27	80	4	20	A	1,31	
EMP09-080x53-A27-LN12-05C	*	○	80	53	27	80	5	25	A	2,33	

● Ex stock ○ On demand

* With internal cooling




Spare parts		
	Insert	LNKT1206PNR-GM
	ØD	40-80
	Screw (clamp)	I60M4*12
	Wrench	WT15IS

System code > B22

Grade selection > B20

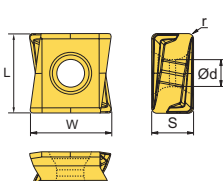
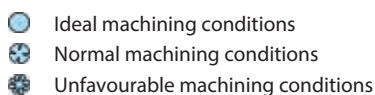

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

LNKT	L	S
12 06	12.7	11.25

Milling inserts

LN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW								
			P	M	K	N	S	H																	
																									
ISO			W	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	LNKT120608PNR-GM	6.75	0.8				●				●				●										

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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Dotted lines for notes.

EMP13 *Kr: 90°*

New square shoulder mill generation

- Specially developed cutting edges for high-quality 90° square shoulder milling.
- Extra thick inserts for better stability.
- Positive, smooth cutting geometry for reduced cutting forces.
- Polished, high-precision geometry for aluminium alloys, steel and cast iron.

Insert grades

YBC302 CVD P15–P35	YBM253 CVD P20–P40 M10–M30	YBG9320 PVD P10–P30 M20–M30	YBG205 PVD P10–P30 M20–M30
YBD152 CVD K05–K25	YBD252 CVD K15–K35	YD101 – K05–K25	

Chip breakers

-GM -LH

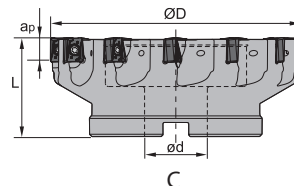
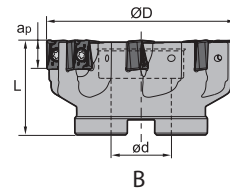
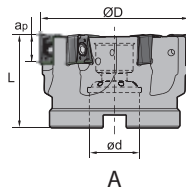
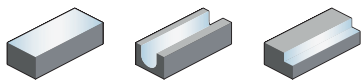


Chip breaker -LH for aluminium



Square shoulder milling

EMP13 Kr: 90°



Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts	
			ØD	ød	L	ap max					
EMP13-040-A16-AN11-04C	*	●	40	16	40	11.2	4	A	0.45	ANGX1105	
EMP13-050-A22-AN11-06		●	50	22	40	11.2	6	A	0.3		
EMP13-063-A22-AN11-06	*	●	63	22	40	11.2	6	A	0.49		
EMP13-063-A22-AN11-07		●	63	22	40	11.2	7	A	0.49		
EMP13-080-A27-AN11-07	*	●	80	27	50	11.2	7	A	1.18		
EMP13-080-A27-AN11-09		●	80	27	50	11.2	9	A	1.18		
EMP13-100-B32-AN11-12		●	100	32	50	11.2	12	B	1.46		
EMP13-100-B32-AN11-12C	*	●	100	32	50	11.2	12	B	1.46		
EMP13-125-B40-AN11-14		●	125	40	63	11.2	14	B	2.92		
EMP13-125-B40-AN11-14C	*	●	125	40	63	11.2	14	B	2.92		
EMP13-160-C40-AN11-16		●	160	40	63	11.2	16	C	4.3		
EMP13-050-A22-AN15-04		●	50	22	40	14.5	4	A	0.26		ANGX1506
EMP13-063-A22-AN15-05		●	63	22	40	14.5	5	A	0.53		
EMP13-080-A27-AN15-06		●	80	27	50	14.5	6	A	1.23		
EMP13-100-B32-AN15-08		●	100	32	50	14.5	8	B	1.52		
EMP13-100-B32-AN15-08C	*	●	100	32	50	14.5	8	B	1.52		
EMP13-125-B40-AN15-10		●	125	40	63	14.5	10	B	3.05		
EMP13-125-B40-AN15-10C	*	●	125	40	63	14.5	10	B	3.05		
EMP13-160-C40-AN15-12		●	160	40	63	14.5	12	C	4.46		
EMP13-200-C60-AN15-16		○	200	60	63	14.5	16	C	6.26		

● Ex stock ○ On demand

* With internal cooling



System code > B22


Grade selection > B20

Technical info > B447




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Spare parts

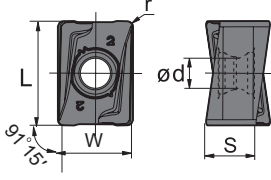


	Insert ØD	ANGX1105 40-160	ANGX1506 50-200
	Screw (insert)	I60M3*9	I60M4*12
	Wrench (insert)	WT09IS	WT15IS



Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ANGX	L	S	d
11 05	11.85	5.7	3.5
15 06	15.43	7.3	4.4

AN** milling insert			HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW									
			P	M	K	N	S	H																
	ISO	W r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ANGX110504PNR-GM	8.4 0.4				●			●				●	●										
	ANGX110508PNR-GM	8.4 0.8	●			●			●	●			●	●										
	ANGX150608PNR-GM	11 0.8	○			●			●	●			●	●										
	ANGX150616PNR-GM	11 1.6				●			●					●										
	ANGX110504PNR-LH	8.4 0.4																					●	
	ANGX150608PNR-LH	11 0.8																					●	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

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Technical info > B447

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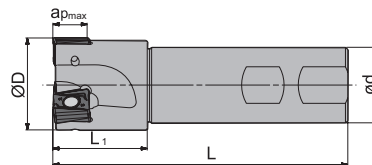
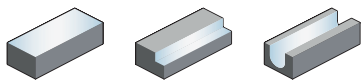
Technical Information

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Square shoulder milling

EMP13 Kr: 90°



Weldon shank

Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	ød	L ₁	L	a _{p max}			
EMP13-025-XP25-AN11-02	●		25	25	32	100	11.2	2	0.31	ANGX1105
EMP13-032-XP32-AN11-03	●		32	32	40	115	11.2	3	0.61	
EMP13-040-XP32-AN11-04	●		40	32	40	125	11.2	4	0.75	
EMP13-032-XP32-AN15-02	●		32	32	40	125	11.2	2	0.66	ANGX1506
EMP13-040-XP32-AN15-03	●		40	32	40	125	11.2	3	0.76	

● Ex stock ○ On demand

* With internal cooling

Spare parts		ANGX1105	ANGX1506	
Insert	ØD	25-40	25-40	
Screw (insert)		I60M3*9	I60M4*12	
Wrench (insert)		WT09IS	WT15IS	

System code > B22

Grade selection > B20

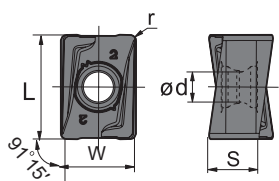
Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

ANGX	L	S	d
11 05	11.85	5.7	3.5
15 06	15.43	7.3	4.4

Milling inserts



AN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW											
ISO	W	r	P	M	K	N	S	H																			
			YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201				
				ANGX110504PNR-GM	8.4	0.4																					
				ANGX110508PNR-GM	8.4	0.8	●																				
				ANGX150608PNR-GM	11	0.8	○																				
				ANGX150616PNR-GM	11	1.6																					
	ANGX150620PNR-GM	11	2																								
	ANGX110504PNR-LH	8.4	0.4																								
	ANGX150608PNR-LH	11	0.8																								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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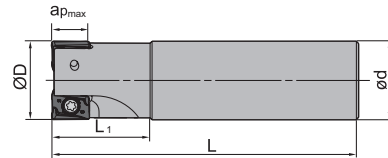
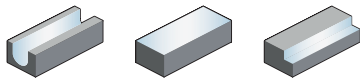
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Square shoulder milling

EMP13 Kr: 90°



Straight shank

Article	* Stock	Dimensions [mm]					Teeth	kg	Inserts
		$\varnothing D$	$\varnothing d$	L_1	L	$a_{p\max}$			
EMP13-025-G25-AN11-02	●	25	25	32	100	11.2	2	0.31	ANGX1105
EMP13-032-G32-AN11-03	●	32	32	40	115	11.2	3	0.61	
EMP13-040-G32-AN11-04	●	40	32	40	125	11.2	4	0.75	
EMP13-032-G32-AN15-02	●	32	32	40	125	14.5	2	0.66	ANGX1506
EMP13-040-G32-AN15-03	●	40	32	40	125	14.5	3	0.76	

● Ex stock ○ On demand

* With internal cooling

Spare parts		ANGX1105	ANGX1506	
Insert	$\varnothing D$	25-40	25-40	
Screw (insert)		I60M3*9	I60M4*12	
Wrench (insert)		WT09IS	WT15IS	




System code > B22

Grade selection > B20

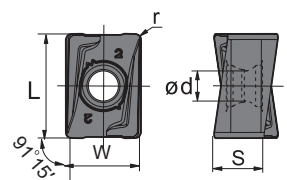


Technical info > B447

Cutting data > B216

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ANGX	L	S	d
11 05	11.85	5.7	3.5
15 06	15.43	7.3	4.4

AN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW											
	P	M	K	N	S	H																						
	ISO			W	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
		ANGX110504PNR-GM	8.4	0.4						●																		
		ANGX110508PNR-GM	8.4	0.8	●					●		●	●															
		ANGX150608PNR-GM	11	0.8	○					●		●	●															
		ANGX150616PNR-GM	11	1.6						●		●	●															
	ANGX150620PNR-GM	11	2						●		●	●																
	ANGX110504PNR-LH	8.4	0.4																							●		
	ANGX150608PNR-LH	11	0.8																							●		

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

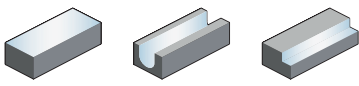
Technical info > B447

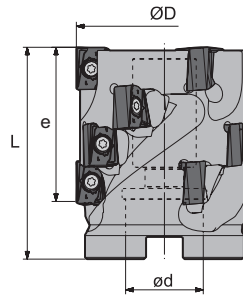
Cutting data > B216




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Square shoulder milling

EMP13 Kr: 90° 






Article	*	Stock	Dimensions [mm]				Teeth	No. of inserts	kg	Inserts 
			ØD	e	ød	L				
EMP13-050x43-A22-AN11-03	●		50	43	22	60	3	12	0.52	ANGX1105
EMP13-063x64-A27-AN11-04	●		63	64	27	80	4	24	1.15	
EMP13-063x53-A27-AN15-03	●		63	53	27	75	3	12	1.14	ANGX1506
EMP13-080x53-A32-AN15-04	●		80	53	32	75	4	16	1.82	

● Ex stock ○ On demand

* With internal cooling

Spare parts

Insert		ANGX1105	ANGX1506	
ØD		50-63	63-80	
	Screw (insert)	I60M3*9	I60M4*12	
	Wrench (insert)	WT09IS	WT15IS	




System code > B22

Grade selection > B20

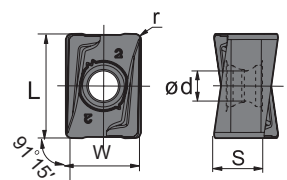










































Technical info > B447

Cutting data > B216

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

ANGX	L	S	d
11 05	11.85	5.7	3.5
15 06	15.43	7.3	4.4

AN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
			P																					
			M																					
			K																					
			N																					
			S																					
			H																					
ISO	W	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ANGX110504PNR-GM	8.4	0.4				●		●				●	●										
	ANGX110508PNR-GM	8.4	0.8	●			●		●	●			●	●										
	ANGX150608PNR-GM	11	0.8	○			●		●	●			●	●										
	ANGX150616PNR-GM	11	1.6				●		●				●											
	ANGX150620PNR-GM	11	2				●		●	●			●											
	ANGX110504PNR-LH	8.4	0.4																				●	
	ANGX150608PNR-LH	11	0.8																				●	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

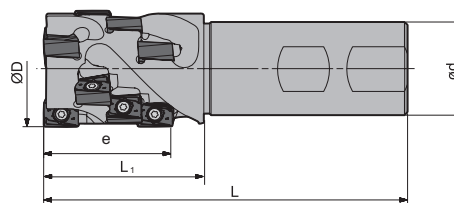
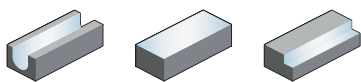
Technical info > B447

Cutting data > B216



Square shoulder milling

EMP13 Kr: 90°






Weldon shank

Article	*	Stock	Dimensions [mm]					Teeth	No. of inserts	kg	Inserts
			ØD	e	ød	L ₁	L				
EMP13-032x43-XP32-AN11-02		●	32	43	32	48	115	2	8	0.61	ANGX1105
EMP13-040x43-XP32-AN11-03		●	40	43	32	55	125	3	12	0.79	
EMP13-040x40-XP32-AN15-02		●	40	40	32	55	115	2	6	0.79	ANGX1506
EMP13-050x53-XP40-AN15-02		○	50	53	40	70	145	2	8	1.53	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	ANGX1105	ANGX1506	
	ØD	32-40	40-50	
 Screw (insert)		I60M3*9	I60M4*12	
 Wrench (insert)		WT09IS	WT15IS	

- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊕ Unfavourable machining conditions

ANGX	L	S	d
11 05	11.85	5.7	3.5
15 06	15.43	7.3	4.4

Milling inserts

AN** milling insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW										
		P	M	K	N	S	H																		
	ISO	W	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ANGX110504PNR-GM	8.4	0.4				●		●					●	●										
	ANGX110508PNR-GM	8.4	0.8	●			●		●	●				●	●										
	ANGX150608PNR-GM	11	0.8	○			●		●	●				●	●										
	ANGX150616PNR-GM	11	1.6				●		●					●											
	ANGX150620PNR-GM	11	2				●		●	●				●											
	ANGX110504PNR-LH	8.4	0.4																					●	
	ANGX150608PNR-LH	11	0.8																					●	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

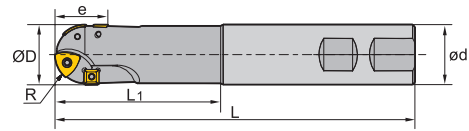
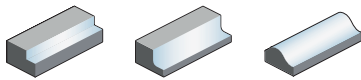
Cutting data > B216



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Profile milling

BMR01



Weldon shank

Article	* Stock	Dimensions [mm]							Teeth		kg	Inserts
		R	ØD	e	ød	L ₁	L	ZDET	SPMT			
BMR01-020-XP20-S	○	10	20	20	20	50	125	2	2	0.3	ZDET08T2 & SPMT0603	
BMR01-020-XP20-M	○	10	20	20	20	75	150	2	2	0.3		
BMR01-020-XP20-L	○	10	20	20	20	100	200	2	2	0.4		
BMR01-025-XP25-S	○	12.5	25	23	25	70	150	2	2	0.5	ZDET1103 & SPMT0603	
BMR01-025-XP25-M	○	12.5	25	23	25	95	175	2	2	0.6		
BMR01-025-XP25-L	○	12.5	25	23	25	100	200	2	2	0.7		
BMR01-032-XP32-S	○	16	32	31	32	85	175	2	2	0.9	ZDET13T2 & SDMT0903	
BMR01-032-XP32-M	○	16	32	31	32	100	200	2	2	1.1		
BMR01-032-XP32-L	○	16	32	31	32	150	250	2	2	1.4		
BMR01-040-XP40-S	○	20	40	41	40	85	175	3	2	1.4	ZPNT2204 & SPMT1204	
BMR01-040-XP40-M	○	20	40	41	40	100	200	3	2	1.7		
BMR01-040-XP40-L	○	20	40	41	40	150	250	3	2	2.1		
BMR01-050-XP40-S	○	25	50	45	40	100	200	3	2	1.8		
BMR01-050-XP40-M	○	25	50	45	40	100	300	3	2	2.8		
BMR01-063-XP40-S	○	31.5	63	52	40	100	200	4	2	3		
BMR01-063-XP40-M	○	31.5	63	52	40	100	300	4	2	3.5		

● Ex stock ○ On demand

* With internal cooling

Spare parts

Insert	ØD	ZDET08T2 & SPMT0603	ZDET1103 & SPMT0603	ZDET13T2 & SDMT0903	ZPNT2204 & SPMT1204
		20	25	32	40-63
Screw (insert)		I43M2.5*5.7	I43M2.5*5.7	I43M4*8	I43M5*11
Wrench (insert)		WT07IP	WT07IP		
Wrench (insert)				WT15IS	WT20IS






System code > B22

Grade selection > B20

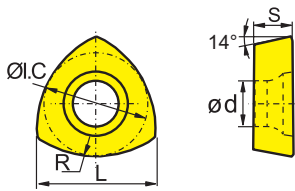



Technical info > B447

Cutting data > B216

ZDET	L	I.C	S	d
08 T2	8.4	6.75	2.78	2.8
11 03	10.6	8.5	3.18	2.8
13 T3	13.2	10.5	3.97	4.4
22 04	16.1	12.7	4.76	5.56

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

ZD** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
	ISO	R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	ZDET13T3CYR16-PM	16				○									○								
	ZDET08T2CYR10	10				○																	
	ZDET1103CYR12.5	12.5				○																	
	ZDET13T3CYR16	16				●																	
	ZPNT2204CY(R20)	20				○																	
	ZPNT2204CY(R25)	25				●																	
	ZPNT2204CY(R31)	31.5				○																	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
06 03	6.35	6.35	3.18	2.8
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW							
	P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	M	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	K																		●				
	N																		●	●			
	S			●		●																	
	H																						
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SPMT060304	0.4				●											○						
	SPMT120408	0.8	○	●	○	●	●										●						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SDMT	L	I.C	S	d
09 03	9.525	9.525	3.18	4.4

Milling inserts

SD** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW							
	P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	M	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	K																		●				
	N																		●	●			
	S			●		●																	
	H																						
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SDMT090308	0.8				●	●																

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

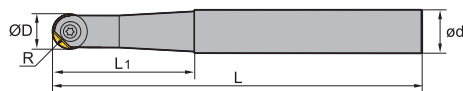
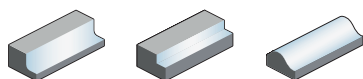
Grade selection > B20


Technical info > B447

Cutting data > B216

Profile milling

BMR02






Article	*	Stock	Dimensions [mm]					kg	Inserts 
			R	ØD	ød	L ₁	L		
BMR02-012-G16-S	●		6	12	16	40	110	0.1	ROHX1203
BMR02-012-G16-M	●		6	12	16	50	130	0.2	
BMR02-012-G16-L	●		6	12	16	50	160	0.2	
BMR02-016-G20-S	●		8	16	20	45	140	0.3	ROHX1604
BMR02-016-G20-M	●		8	16	20	65	170	0.3	
BMR02-016-G20-L	●		8	16	20	65	200	0.4	
BMR02-020-G25-S	●		10	20	25	60	160	0.5	ROHX2005
BMR02-020-G25-M	●		10	20	25	80	200	0.6	
BMR02-020-G25-L	●		10	20	25	80	240	0.8	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	ROHX1203	ROHX1604	ROHX2005	
		12	16	20	
 Screw (insert)		I70M4*10TT	I70M5*12TT	I70M5*16TT	
 Wrench (insert)		WT15IS	WT20IS	WT20IS	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



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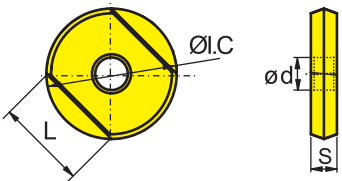

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-  Ideal machining conditions
-  Normal machining conditions
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ROHX	L	I.C	S	d
12 03	8.5	12	3	4
16 04	11.3	16	4	5
20 05	14.1	20	5	5

Milling inserts

RO** positive insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ROHX1203										○			●				●					
	ROHX1604													●				●					
	ROHX2005													●				●					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

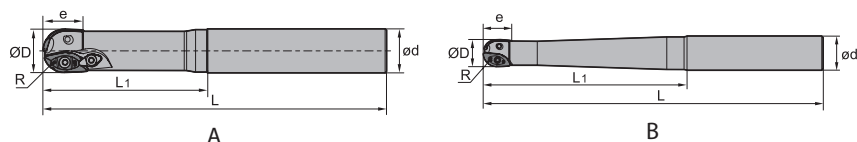
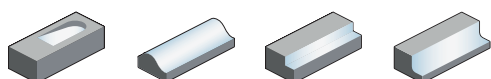
Technical info > B447

Cutting data > B216



Profile milling

BMR03



Straight shank

Article	* Stock	Dimensions [mm]							Teeth	Coupling	kg	Inserts
		R	ØD	e	ød	L ₁	L					
BMR03-016-G20-S	●	8	16	16	20	70	150	2	B	0.3	XPHT16	
BMR03-016-G20-M	●	8	16	16	20	80	180	2	B	0.4		
BMR03-020-G25-S	●	10	20	20	25	80	180	2	B	0.5	XPHT20	
BMR03-020-G25-M	●	10	20	20	25	100	200	2	B	0.6		
BMR03-020-G25-L	●	10	20	20	25	150	250	2	B	0.7		
BMR03-020-G25-XL	●	10	20	20	25	110	300	2	B	1		
BMR03-025-G25-S	●	12.5	25	25	25	80	180	2	B	0.6	XPHT25	
BMR03-025-G25-M	●	12.5	25	25	25	100	200	2	B	0.7		
BMR03-025-G25-L	●	12.5	25	25	25	110	250	2	B	0.8		
BMR03-025-G25-XL	○	12.5	25	25	25	120	300	2	B	1		
BMR03-030-G32-S	●	15	30	30	32	120	200	2	A	1	XPHT30	
BMR03-030-G32-M	●	15	30	30	32	150	250	2	A	1.3		
BMR03-030-G32-L	○	15	30	30	32	200	300	2	A	1.6		
BMR03-030-G32-XL	○	15	30	30	32	200	350	2	A	1.9		
BMR03-032-G32-S	●	16	32	32	32	120	200	2	A	1.1	XPHT32	
BMR03-032-G32-M	●	16	32	32	32	150	250	2	A	1.4		
BMR03-032-G32-L	●	16	32	32	32	200	300	2	A	1.6		
BMR03-032-G32-XL	○	16	32	32	32	200	350	2	A	2		
BMR03-040-G40-S	○	20	40	40	40	120	200	2	A	1.6	XPHT40	
BMR03-040-G40-M	○	20	40	40	40	150	250	2	A	2		
BMR03-040-G40-L	●	20	40	40	40	200	300	2	A	2.5		
BMR03-040-G40-XL	○	20	40	40	40	200	350	2	A	3		

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



Spare parts

Insert	XPHT16	XPHT20	XPHT25	XPHT30	XPHT32	XPHT40
ØD	16	20	25	30	32	40
	Clamp			WD-208	WD-208	
	Clamp					CBH5R1
	Screw (clamp)			I60M5*13	I60M5*13	I43M6*16
	Screw (insert)	I60M2.5*6.5		I60M4*10	I60M5*13	I43M6*16
	Screw (insert)		I60M3.5*08TT			
	Wrench (clamp)			WT20IT	WT20IT	WT25IT
	Wrench (insert)			WT20IT	WT20IT	WT25IT
	Wrench (insert)		WT15S			
	Wrench (insert)	WT07P				
	Wrench (insert)		WT10IP			



XPHT	L	S	d
16	16	3.18	3.1
20	20	3.97	4
25	25	4.76	4.7
30	30	6.35	5.8
32	32	6.35	5.8
40	40	7.94	6.8

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

XP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW												
			P	M	K	N	S	H																			
ISO			R	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
	XPHT16R0803-GM	8	9																								
	XPHT20R10T3-GM	10	9																								
	XPHT25R1204-GM	12.5	9																								
	XPHT30R1506-GM	15	11																								
	XPHT32R1606-GM	16	9																								
	XPHT40R2007-GM	20	9																								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B216

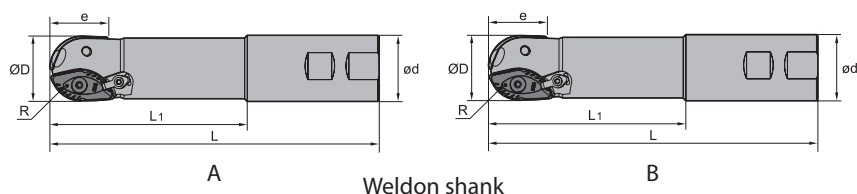
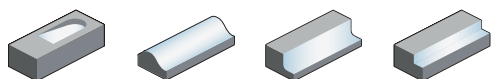
Grade selection > B20

Technical info > B22

Cutting data > B447

Profile milling

BMR03



Article	* Stock	Dimensions [mm]							Teeth	Coupling	kg	Inserts
		R	ØD	e	ød	L ₁	L					
BMR03-016-XP20-M	●	8	16	16	20	60	111	2	B	0.2	XPHT16	
BMR03-020-XP25-M	●	10	20	20	25	70	127	2	B	0.3	XPHT20	
BMR03-020-XP25-L	●	10	20	20	25	80	150	2	B	0.4	XPHT25	
BMR03-025-XP25-M	●	12.5	25	25	25	80	137	2	B	0.4	XPHT25	
BMR03-025-XP25-L	●	12.5	25	25	25	100	200	2	B	0.6	XPHT30	
BMR03-030-XP32-M	●	15	30	30	32	100	161	2	A	0.8	XPHT30	
BMR03-030-XP32-L	●	15	30	30	32	150	250	2	A	1.3	XPHT32	
BMR03-032-XP32-M	●	16	32	32	32	100	161	2	A	0.8	XPHT32	
BMR03-032-XP32-L	●	16	32	32	32	120	250	2	A	1.3	XPHT40	
BMR03-040-XP40-M	●	20	40	40	40	100	175	2	A	1.3	XPHT40	
BMR03-040-XP40-L	●	20	40	40	40	120	250	2	A	2	XPHT50	
BMR03-050-XP50-M	○	25	50	50	50	100	200	2	A	2.5	XPHT50	
BMR03-050-XP50-L	○	25	50	50	50	150	250	2	A	3.1		

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



Spare parts

Insert	XPHT16	XPHT20	XPHT25	XPHT30	XPHT32	XPHT40	XPHT50
ØD	16	20	25	30	32	40	50
Clamp				WD-208	WD-208		
Clamp						CBH5R1	CBH5R1
Screw (clamp)				I60M5*13	I60M5*13	I43M6*16	I43M6*16
Screw (insert)	I60M2.5*6.5		I60M4*10	I60M5*13	I60M5*13	I43M6*16	I43M8*21
Screw (insert)							
Wrench (clamp)				WT20IT	WT20IT	WT25IT	WT25IT
Wrench (insert)				WT20IT	WT20IT	WT25IT	WT30IT
Wrench (insert)	WT07P						
Wrench (insert)			WT15S				
Wrench (insert)		WT10IP					



XPHT	L	S	d
16	16	3.18	3.1
20	20	3.97	4
25	25	4.76	4.7
30	30	6.35	5.8
32	32	6.35	5.8
40	40	7.94	6.8
50	50	7.94	9.2

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

XP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
ISO	R	α	P	M	K	N	S	H																
			YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
			XPHT16R0803-GM																					
			XPHT20R10T3-GM																					
			XPHT25R1204-GM																					
			XPHT30R1506-GM																					
			XPHT32R1606-GM																					
			XPHT40R2007-GM																					
		XPHT50R2507-GM																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

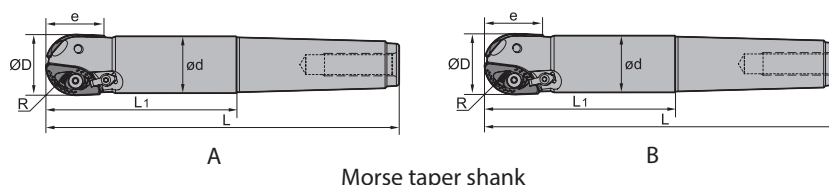
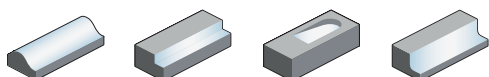
Grade selection > B20

Technical info > B447

Cutting data > B216

Profile milling

BMR03



Morse taper shank

Article	* Stock	Dimensions [mm]							Teeth	Coupling	kg	Inserts
		R	ØD	e	ød	L ₁	L					
BMR03-020-MT3-M	○	10	20	20	18.7	70	156	2	B	0.4	XPHT20	
BMR03-020-MT3-L	●	10	20	20	18.7	100	186	2	B	0.4		
BMR03-025-MT3-M	○	12.5	25	25	23.5	70	156	2	B	0.4	XPHT25	
BMR03-025-MT3-L	○	12.5	25	25	23.5	100	186	2	B	0.4		
BMR03-030-MT4-M	○	15	30	30	28.2	70	189	2	A	0.8	XPHT30	
BMR03-030-MT4-L	○	15	30	30	28.2	120	229	2	A	1		
BMR03-032-MT4-M	○	16	32	32	29.2	70	179	2	A	0.9	XPHT32	
BMR03-032-MT4-L	●	16	32	32	29.2	100	209	2	A	0.9		
BMR03-040-MT4-M	○	20	40	40	36.9	100	199	2	A	1	XPHT40	
BMR03-040-MT5-L	○	20	40	40	36.9	90	226	2	A	1.8		
BMR03-040-MT5-XL	○	20	40	40	36.9	120	256	2	A	2		
BMR03-050-MT5-M	●	25	50	50	46.8	100	236	2	A	2.2	XPHT50	
BMR03-050-MT5-L	○	25	50	50	46.8	150	286	2	A	2.9		

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



Spare parts

Insert	ØD	XPHT20	XPHT25	XPHT30	XPHT32	XPHT40	XPHT50
		20	25	30	32	40	50
	Clamp			WD-208	WD-208		
	Clamp					CBH5R1	CBH5R1
	Screw (clamp)			I60M5*13	I60M5*13	I43M6*16	I43M6*16
	Screw (insert)		I60M4*10	I60M5*13	I60M5*13	I43M6*16	I43M8*21
	Screw (insert)	I60M3.5*08TT					
	Wrench (clamp)			WT20IT	WT20IT	WT25IT	WT25IT
	Wrench (insert)			WT20IT	WT20IT	WT25IT	WT30IT
	Wrench (insert)		WT15S				
	Wrench (insert)	WT10P					



XPHT	L	S	d
20	20	3.97	4
25	25	4.76	4.7
30	30	6.35	5.8
32	32	6.35	5.8
40	40	7.94	6.8
50	50	7.94	9.2

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

XP** milling insert		HC ¹ (CVD)							HC ¹ (PVD)			HT	HC ²	HW											
ISO		R	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	XPHT20R10T3-GM	10	9																						
	XPHT25R1204-GM	12.5	9																						
	XPHT30R1506-GM	15	11																						
	XPHT32R1606-GM	16	9																						
	XPHT40R2007-GM	20	9																						
	XPHT50R2507-GM	25	9																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

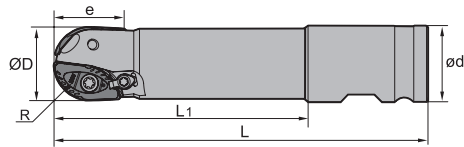
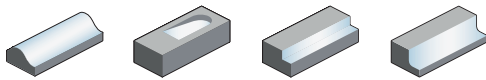
Grade selection > B20

Technical info > B447



Cutting data >

Profile milling

BMR03








Compound shank

Article	*	Stock	Dimensions [mm]						Teeth	kg	Inserts
			R	ØD	e	ød	L ₁	L			
BMR03-040-XPX-M		○	20	40	40	50.8	170	250	2	1.3	 XPHT40
BMR03-040-XPX-L		○	20	40	40	50.8	220	300	2	3.1	
BMR03-040-XPX-XL		○	20	40	40	50.8	270	350	2	3.5	
BMR03-050-XPX-M		○	25	50	50	50.8	170	250	2	3.1	 XPHT50
BMR03-050-XPX-L		○	25	50	50	50.8	200	300	2	3.8	
BMR03-050-XPX-XL		○	25	50	50	50.8	270	350	2	4.4	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	XPHT40	XPHT50
	ØD	40	50
	Clamp	CBH5R1	CBH5R1
	Screw (clamp)	I43M6*16	I43M6*16
	Screw (insert)	I43M6*16	I43M8*21
	Wrench (clamp)	WT25IT	WT25IT
	Wrench (insert)	WT25IT	WT30IT



Indexable milling Profile milling

A

Turning

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Drilling

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Technical Information

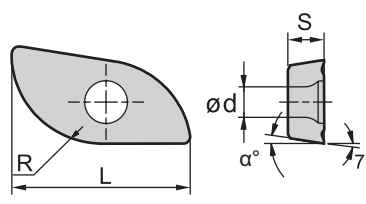



























































































E

Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

XPHT	L	S	d
40	40	7.94	6.8
50	50	7.94	9.2

Milling inserts

XP** milling insert		HC ¹ (CVD)								HC ¹ (PVD)					HT	HC ²	HW						
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	R	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	XPHT40R2007-GM	20	9														●						
	XPHT50R2507-GM	25	9														●						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

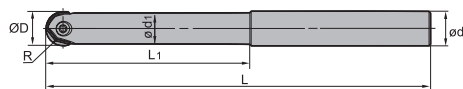
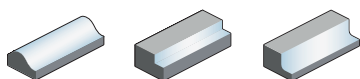
Grade selection > B20

Technical info > B447

Cutting data > B216

Profile milling

BMR04



Straight shank

Article	*	Stock	Dimensions [mm]						kg	Inserts
			R	ØD	Ød	Ød1	L ₁	L		
BMR04-012-G12-M	●	●	6	12	12	11	35	125	0.1	ZOHX12
BMR04-012-G12-L	●	●	6	12	12	11	45	150	0.1	
BMR04-016-G16-M	●	●	8	16	16	14	40	150	0.2	ZOHX16
BMR04-016-G16-L	●	●	8	16	16	14	55	180	0.3	
BMR04-020-G20-M	●	●	10	20	20	18	65	180	0.4	ZOHX20
BMR04-020-G20-L	●	●	10	20	20	18	100	250	0.6	
BMR04-025-G25-M	●	●	12.5	25	25	23	70	200	0.7	ZOHX25
BMR04-025-G25-L	●	●	12.5	25	25	23	100	250	0.9	
BMR04-030-G32-M	●	●	15	30	32	27	80	250	1.2	ZOHX30
BMR04-030-G32-L	●	●	15	30	32	27	110	300	1.5	
BMR04-032-G32-M	●	●	16	32	32	29	80	250	1.4	ZOHX32
BMR04-032-G32-L	●	●	16	32	32	29	110	300	1.7	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	ZOHX12	ZOHX16	ZOHX20	ZOHX25	ZOHX30	ZOHX32	
	ØD	12	16	20	25	30	32	
	Screw (insert)	I70M4*10TT	I70M5*12TT	I70M5*16TT	I70M6*20TT	I70M8*25TT	I70M8*25TT	
	Wrench (insert)	WT15IP	WT20IP	WT20IP	WT20IP			
	Wrench (insert)					WT30IT	WT30IT	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

B

Milling

C

Drilling




D

Technical Information

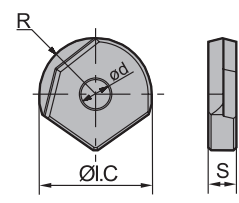


E

Index

ZOHX	I.C	S	d
12	12	1.5	4
16	16	4	5
20	20	5	5
25	25	6	6
30	30	7	8
32	32	7	8

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

ZO** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
	ISO	R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ZOHX1203-GF	6																						
	ZOHX1604-GF	8																						
	ZOHX2005-GF	10																						
	ZOHX2506-GF	12.5																						
	ZOHX3007-GF	15																						
	ZOHX3207-GF	16																						
	ZOHX1203-GM	6																						
	ZOHX1604-GM	8																						
	ZOHX2005-GM	10																						
	ZOHX2506-GM	12.5																						
	ZOHX3007-GM	15																						
	ZOHX3207-GM	16																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

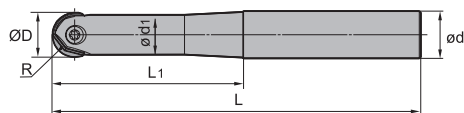
Technical info > B447

Cutting data > B216



Profile milling

BMR04



Straight shank

Article	*	Stock	Dimensions [mm]						kg	Inserts
			R	ØD	ød	Ød1	L ₁	L		
BMR04-012-G16-M	●	●	6	12	16	11	50	125	0.2	ZOHX12
BMR04-012-G16-L	●	●	6	12	16	11	70	150	0.2	
BMR04-016-G20-M	●	●	8	16	20	14	60	150	0.3	ZOHX16
BMR04-016-G20-L	●	●	8	16	20	14	80	180	0.3	
BMR04-020-G25-M	●	●	10	20	25	18	75	180	0.6	ZOHX20
BMR04-020-G25-L	●	●	10	20	25	18	95	200	0.6	
BMR04-025-G32-M	●	●	12.5	25	32	23	90	200	1	ZOHX25
BMR04-025-G32-L	●	●	12.5	25	32	23	110	250	1.3	
BMR04-030-G40-M	●	●	15	30	40	27	110	250	2	ZOHX30
BMR04-030-G40-L	●	●	15	30	40	27	125	300	2.4	
BMR04-032-G40-M	●	●	16	32	40	29	110	250	2	ZOHX32
BMR04-032-G40-L	●	●	16	32	40	29	125	300	2.4	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	ZOHX12	ZOHX16	ZOHX20	ZOHX25	ZOHX30	ZOHX32	
	ØD	12	16	20	25	30	32	
	Screw (insert)	I70M4*10TT	I70M5*12TT	I70M5*16TT	I70M6*20TT	I70M8*25TT	I70M8*25TT	
	Wrench (insert)	WT15IP	WT20IP	WT20IP	WT20IP			
	Wrench (insert)					WT30IT	WT30IT	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

B

Milling

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D

Technical Information

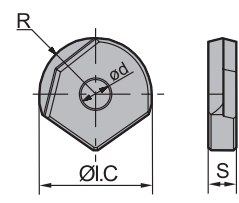


E

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ZOHX	I.C	S	d
12	12	1.5	4
16	16	4	5
20	20	5	5
25	25	6	6
30	30	7	8
32	32	7	8

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

ZO** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ZOHX1203-GF	6																					
	ZOHX1604-GF	8																					
	ZOHX2005-GF	10																					
	ZOHX2506-GF	12.5																					
	ZOHX3007-GF	15																					
	ZOHX3207-GF	16																					
	ZOHX1203-GM	6																					
	ZOHX1604-GM	8																					
	ZOHX2005-GM	10																					
	ZOHX2506-GM	12.5																					
	ZOHX3007-GM	15																					
	ZOHX3207-GM	16																					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

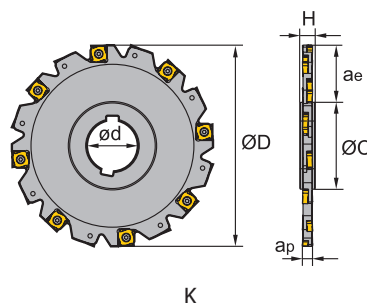
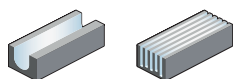
Technical info > B447

Cutting data > B216



Slot milling

SMP01



Article	* Stock	Dimensions [mm]							Coupling	kg	Inserts
		ØD	ød	Øc	H	ap	ae max				
SMP01-100x4-K27-SN12-10	○	100	27	45	12	4	25	K	0.2	XSEQ1202	
SMP01-125x4-K40-SN12-12	○	125	40	56	12	4	32	K	0.3		
SMP01-160x4-K40-SN12-16	●	160	40	67	12	4	44	K	0.5		
SMP01-100x5-K27-SN12-10	○	100	27	45	12	5	25	K	0.2		XSEQ1203
SMP01-125x5-K40-SN12-12	○	125	40	56	12	5	32	K	0.3		
SMP01-160x5-K40-SN12-16	○	160	40	67	12	5	44	K	0.6		
SMP01-100x7-K27-SN12-10	●	100	27	45	12	7	25	K	0.3	XSEQ1204	
SMP01-125x7-K40-SN12-12	○	125	40	56	12	7	32	K	0.4		
SMP01-160x7-K40-SN12-16	○	160	40	67	12	7	44	K	0.8		
SMP01-200x7-K50-SN12-18	○	200	50	71	12	7	62	K	1.2		XSEQ12T3
SMP01-250x7-K50-SN12-24	○	250	50	71	12	7	87	K	1.9		
SMP01-100x6-K27-SN12-10	○	100	27	45	12	6	25	K	0.3		
SMP01-125x6-K40-SN12-12	○	125	40	56	12	6	32	K	0.4		
SMP01-160x6-K40-SN12-16	○	160	40	67	12	6	44	K	0.7	XSEQ12T4	
SMP01-200x6-K50-SN12-18	○	200	50	71	12	6	62	K	1.1		
SMP01-250x6-K50-SN12-24	○	250	50	71	12	6	87	K	1.7		
SMP01-100x8-K27-SN12-10	●	100	27	45	12	8	25	K	0.3		XSEQ12T4
SMP01-125x8-K40-SN12-12	○	125	40	56	12	8	32	K	0.5		
SMP01-160x8-K40-SN12-16	●	160	40	67	12	8	44	K	0.9		
SMP01-200x8-K50-SN12-18	●	200	50	71	12	8	62	K	1.4		
SMP01-250x8-K50-SN12-24	●	250	50	71	12	8	87	K	2.2		

● Ex stock ○ On demand

* With internal cooling

System code > B26

Grade selection > B20

Technical info > B447

Cutting data > B216



Indexable milling Slot milling

Spare parts

	Insert ØD	XSEQ1202 63-160	XSEQ1203 63-160	XSEQ1204 63-250	XSEQ12T3 63-250	XSEQ12T4 63-250
	Screw (insert)	I91M4*3.2X	I91M4*3.2X	I91M4*6.1X	I91M4*5.1X	I91M4*7.1X
	Wrench (insert)	WT08IP	WT08IP	WT08IP	WT08IP	WT08IP



A

Turning

B

Milling

XSEQ	L	I.C	S	d
12 02	12.7	12.7	2.3	5
12 03	12.7	12.7	3	5
12 04	12.7	12.7	4	5
12 T3	12.7	12.7	3.5	5
12 T4	12.7	12.7	4.5	5

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

XS** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	XSEQ1202																●						
	XSEQ1203	○		●													●						
	XSEQ1204																●						
	XSEQ12T3		●														●						○
	XSEQ12T4																●						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

C

Drilling

D

Technical Information

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System code > B26

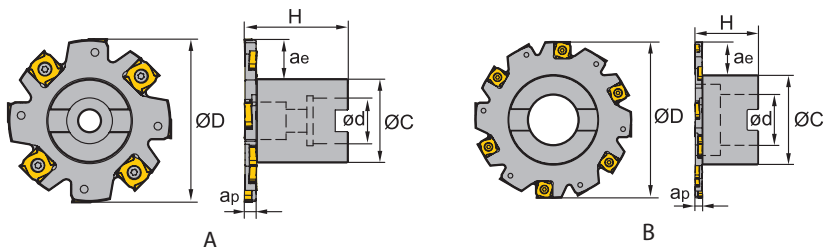
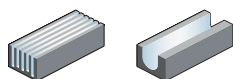
Grade selection > B20

Technical info > B447

Cutting data > B216

Slot milling

SMP01



Article	*	Stock		Dimensions [mm]						Teeth	Coupling	kg	Inserts
		R	L	ØD	Ød	ØC	H	ap	ae max				
SMP01-063x4-A22-SN12-06	● ○	63	22	32	40	4	14	6	A	0.2	XSEQ1202		
SMP01-080x4-A22-SN12-08	● ○	80	22	40	40	4	18	8	A	0.4			
SMP01-100x4-A27-SN12-10	● ○	100	27	48	50	4	23	10	A	0.6			
SMP01-063x5-A22-SN12-06	● ○	63	22	32	40	5	14	6	A	0.2	XSEQ1203		
SMP01-080x5-A22-SN12-08	○ ○	80	22	40	40	5	18	8	A	0.4			
SMP01-100x5-A27-SN12-10	○ ○	100	27	48	50	5	23	10	A	0.7			
SMP01-063x7-A22-SN12-06	○ ○	63	22	32	40	7	14	6	A	0.2	XSEQ1204		
SMP01-080x7-A22-SN12-08	○ ○	80	22	40	40	7	18	8	A	0.5			
SMP01-100x7-A27-SN12-10	○ ○	100	27	48	50	7	23	10	A	0.7			
SMP01-125x7-B40-SN12-12	○ ○	125	40	72	50	7	23	12	B	1.1	XSEQ12T3		
SMP01-160x7-B40-SN12-16	○ ○	160	40	70	60	7	41	16	B	1.4			
SMP01-063x6-A22-SN12-06	● ○	63	22	32	40	6	14	6	A	0.2			
SMP01-080x6-A22-SN12-08	● ○	80	22	40	40	6	18	8	A	0.5	XSEQ12T4		
SMP01-100x6-A27-SN12-10	○ ○	100	27	48	50	6	23	10	A	0.7			
SMP01-125x6-B40-SN12-12	○ ○	125	40	72	50	6	23	12	B	1			
SMP01-160x6-B40-SN12-16	○ ○	160	40	70	60	6	41	16	B	1.3	XSEQ12T4		
SMP01-063x8-A22-SN12-06	● ○	63	22	32	40	8	14	6	A	0.2			
SMP01-080x8-A22-SN12-08	○ ○	80	22	40	40	8	18	8	A	0.5			
SMP01-100x8-A27-SN12-10	○ ○	100	27	48	50	8	23	10	A	0.8	XSEQ12T4		
SMP01-125x8-B40-SN12-12	○ ○	125	40	72	50	8	23	12	B	1.1			
SMP01-160x8-B40-SN12-16	● ○	160	40	70	60	8	41	16	B	1.5			

● Ex stock ○ On demand

* With internal cooling

System code > B26

Grade selection > B20

Technical info > B447

Cutting data > B216



Indexable milling Slot milling

Spare parts

	Insert ØD	XSEQ1202 63-160	XSEQ1203 63-160	XSEQ1204 63-250	XSEQ12T3 63-250	XSEQ12T4 63-250
	Screw (insert)	I91M4*3.2X	I91M4*3.2X	I91M4*6.1X	I91M4*5.1X	I91M4*7.1X
	Wrench (insert)	WT08IP	WT08IP	WT08IP	WT08IP	WT08IP



A

Turning

B

Milling

XSEQ	L	I.C	S	d
12 02	12.7	12.7	2.3	5
12 03	12.7	12.7	3	5
12 04	12.7	12.7	4	5
12 T3	12.7	12.7	3.5	5
12 T4	12.7	12.7	4.5	5

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

XS** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
		P	M	K	N	S	H																
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	XSEQ1202													●									
	XSEQ1203	○	●											●									
	XSEQ1204													●									
	XSEQ12T3	●												●								○	
	XSEQ12T4													●									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

C

Drilling

D

Technical Information

E

Index

System code > B26

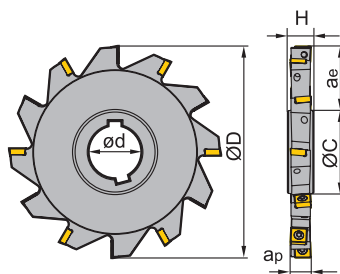
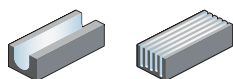
Grade selection > B20

Technical info > B447

Cutting data > B216

Slot milling

SMP03



K

Article	* Stock	Dimensions [mm]							Teeth	Coupling	kg	Inserts
		ØD	ød	Øc	H	ap	ae,max					
SMP03-080x8-K27-MP06-10	●	80	27	44	12	8	17.6	10	K	0.2	MPHT0603	
SMP03-100x8-K32-MP06-14	○	100	32	49	12	8	25.1	14	K	0.3		
SMP03-100x10-K32-MP06-14	○	100	32	49	14	10	25.1	14	K	0.4		
SMP03-125x10-K40-MP06-16	○	125	40	57	14	10	33.6	16	K	0.6	MPHT0803	
SMP03-125x12-K40-MP08-12	○	125	40	58.3	16	12	32.6	12	K	0.7		
SMP03-160x12-K40-MP08-14	○	160	40	64.3	16	12	31.5	14	K	1.3		
SMP03-160x16-K40-MP12-12	○	160	40	64.6	20	16	47.6	12	K	1.6	MPHT1204	
SMP03-160x18-K40-MP12-12	○	160	40	65.3	24	18	47.3	12	K	1.9		
SMP03-160x20-K40-MP12-12	○	160	40	65.3	26	20	47.3	12	K	2.1		
SMP03-200x16-K50-MP12-14	○	200	50	74.6	20	16	62.6	14	K	2.5		
SMP03-200x18-K50-MP12-14	○	200	50	75.3	24	18	62.3	14	K	2.9		
SMP03-200x20-K50-MP12-14	●	200	50	75.3	26	20	62.3	14	K	3.3		

● Ex stock ○ On demand

* With internal cooling

Spare parts					
Insert	MPHT0603	MPHT0803	MPHT1204		
ØD	80-125	125-160	160-200		
Screw (insert)	I60M2.5*6.5	I60M3*7	I60M5*13		
Wrench (insert)			WT20IS		
Wrench (insert)	WT07IP	WT09IP			

System code > B26

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

B

Milling

C




Drilling

D

Technical Information

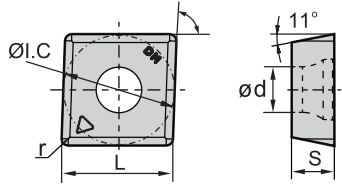

E

Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

MPHT	L	I.C	S	d
06 03	6.35	6.35	3.18	2.8
08 03	8.3	8.3	3.18	3.4
12 04	12.7	12.7	4.76	5.56

Milling inserts

MP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO	r		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151		YNG151C	YD101	YD201
	MPHT060304-DM	0.4	●			●									●									
	MPHT080305-DM	0.5	●			●									●									
	MPHT120408-DM	0.8	●			○		●							●									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B26

Grade selection > B20

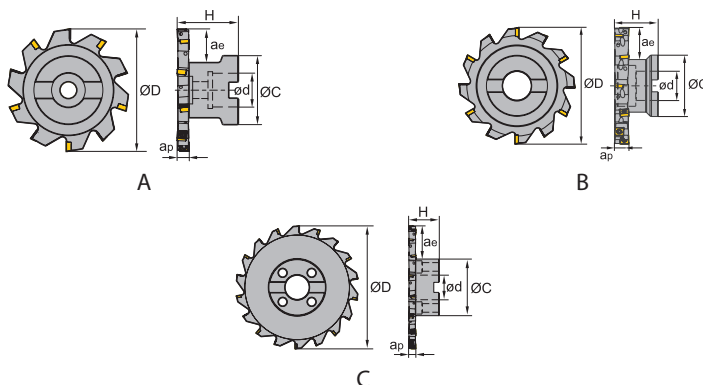
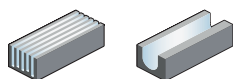
Technical info > B447

Cutting data > B216



Slot milling

SMP03



Article	*	Stock		Dimensions [mm]						Teeth	Coupling	kg	Inserts
		R	L	ØD	ød	Øc	H	ap	ae max				
SMP03-080x8-A22-	●	○	80	22	45	40	8	21	10	A	0.4	MPHT0603	
SMP03-100x8-B27-	○	○	100	27	55	40	8	24.5	14	B	0.6		
SMP03-100x10-B27-	●	○	100	27	55	40	10	24.5	14	B	0.7		
SMP03-125x10-B32-	○	○	125	32	65	45	10	33.3	16	B	1.1	MPHT0803	
SMP03-125x12-B32-	○	○	125	32	65	45	12	33	12	B	1.4		
SMP03-160x12-B40-	○	○	160	40	80	50	12	44	14	B	1.9	MPHT0803	
SMP03-200x12-C40-	○	○	200	40	92	50	12	52	18	C	3.2		
SMP03-125x16-B32-	○	○	125	32	65	50	16	33	10	B	2.3	MPHT1204	
SMP03-160x16-B40-	○	○	160	40	80	60	16	45	12	B	2.3		
SMP03-160x18-B40-	○	○	160	40	80	60	18	45	12	B	2.4		
SMP03-200x16-C40-	○	○	200	40	92	50	16	52	14	C	3.6		
SMP03-200x18-C40-	○	○	200	40	92	50	18	52	14	C	3.9		
SMP03-200x20-C40-	○	○	200	40	92	50	20	52	14	C	4.2		

● Ex stock ○ On demand

* With internal cooling

Spare parts					
	Insert	MPHT0603	MPHT0803	MPHT1204	
	ØD	80-125	125 -200	125 -200	
	Screw (insert)	I60M2.5*6.5	I60M3*7	I60M5*13	
	Wrench (insert)	WT07IP	WT09IP		
	Wrench (insert)			WT20IS	

System code > B26

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

B

Milling

C




Drilling

D

Technical Information

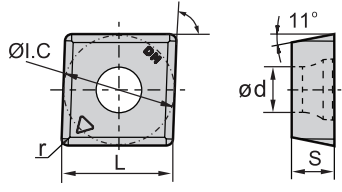

E

Index

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

MPHT	L	I.C	S	d
06 03	6.35	6.35	3.18	2.8
08 03	8.3	8.3	3.18	3.4
12 04	12.7	12.7	4.76	5.56

Milling inserts

MP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO	r		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	MPHT060304-DM	0.4	●			●											●							
	MPHT080305-DM	0.5	●			●											●							
	MPHT120408-DM	0.8	●			○		●									●							

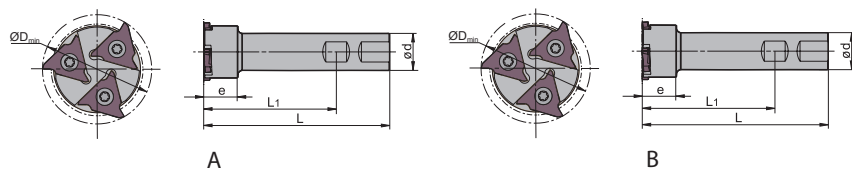
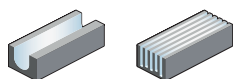
● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



Slot milling

SMP05



Article	*	Stock	Dimensions [mm]					Teeth	Coupling	Inserts
			e	$\varnothing D_{min}$	$\varnothing d$	L_1	L			
SMP05-025x3.0-XP25-QC16-01		●	40	25	25	89	125	1	A	QC16L
SMP05-039x3.0-XP25-QC16-03		●	23	39	25	89	125	3	B	
SMP05-044x4.8-XP25-QC22-03		○	23	44	25	89	125	3	B	QC22L

● Ex stock ○ On demand

* With internal cooling

Spare parts

Insert		QC16L	QC16L	QC22L	
$\varnothing D$		25	39	44	
	Screw (insert)	I60M3.5*10	I60M3.5*10	I60M5*13	
	Wrench (insert)	WT15IP	WT15IP	WT20IP	

System code > B26

Grade selection > B20




Technical info > B447

Cutting data > B216

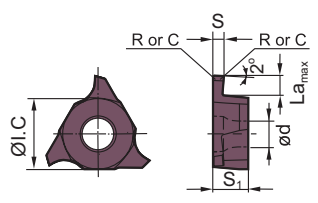



























































































Indexable milling Slot milling

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

QC16	I.C	d
16	9.525	4.4

QC** turning/milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW						
				P																				
				M																				
				K																				
				N																				
				S																				
				H																				
ISO	±0.025	La _{max}	R/C	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
QC16L075-R01	0.75	2	0.1												○									
QC16L095-R01	0.95	2	0.1												○									
QC16L100-R01	1	2	0.1												○									
QC16L110-R01	1.1	2	0.1													●	●							
QC16L120-R01	1.2	2	0.1													○	○							
QC16L125-R02	1.25	2	0.2													●								
QC16L130-R02	1.3	2	0.2													●	○							
QC16L145-R02	1.45	2	0.2													●								
QC16L150-R02	1.5	2	0.2													○								
QC16L160-R02	1.6	2	0.2													●	○							
QC16L165-R02	1.65	2	0.2													○								
QC16L170-R02	1.7	2	0.2													○								
QC16L175-R02	1.75	2	0.2													●								
QC16L185-R02	1.85	2.5	0.2													●								
QC16L200-R02	2	2.5	0.2													●								
QC16L210-R02	2.1	2.5	0.2													○								
QC16L210-R05	2.1	2.5	0.5													○								
QC16L220-R02	2.2	2.5	0.2													○								
QC16L250-R02	2.5	2.5	0.2													●								
QC16L300-R02	3	3	0.2													●								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B26

Grade selection > B20

Technical info > B447

Cutting data > B216

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

QC22	I.C	d
22	12.7	5.5

QC** turning/milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW					
				P	M	K	N	S	H														
				YBC302						YBG101							YNG151C	YD101	YD201				
ISO	S±0.025	La _{max}	R/C	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
QC22L100-R02	1	2	0.2																				
QC22L125-R02	1.25	2	0.2																				
QC22L145-R02	1.45	2	0.2																				
QC22L150-R02	1.5	3.5	0.2																				
QC22L175-R02	1.75	3.5	0.2																				
QC22L185-R02	1.85	3.5	0.2																				
QC22L200-R02	2	3.5	0.2																				
QC22L230-R02	2.3	3.5	0.2																				
QC22L250-R03	2.5	4	0.3																				
QC22L265-R03	2.65	4	0.3																				
QC22L280-R03	2.8	4	0.3																				
QC22L300-R03	3	4	0.3																				
QC22L320-R03	3.2	4	0.3																				
QC22L330-R03	3.3	4	0.3																				
QC22L350-R03	3.5	5	0.3																				
QC22L400-R04	4	5	0.4																				
QC22L430-R04	4.3	5	0.4																				
QC22L450-R04	4.5	5	0.4																				
QC22L480-R04	4.8	5	0.4																				

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A Turning
B Milling
C Drilling
D Technical Information
E Index



XMR01 *Kr: 11/16/22°*

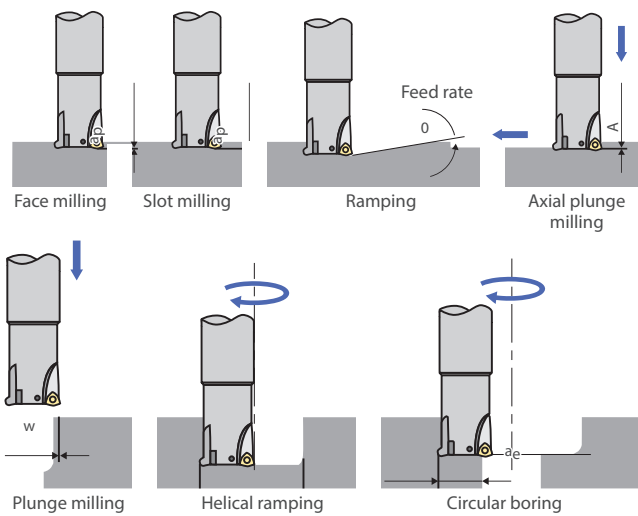
High-feed mill

- Wide range of inserts and grades.
- High-feed mill for high chip removal rates.
- Low cutting forces even with large projecting lengths.

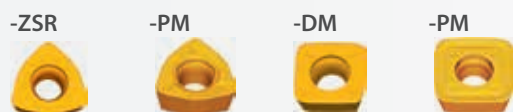
Insert grades

YBC302 CVD P15–P35	YBM253 CVD P20–P40 M10–M30	YBG205 PVD P10–P30 M20–M30	YBG202 PVD P10–P30
YBG302 CVD P15–P35	YBG212 PVD M10–M25	YBM351 CVD P25–P40	YBD252 CVD K15–K35

Machining operations

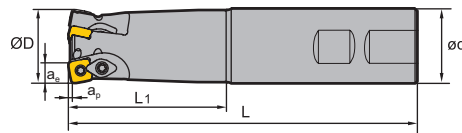
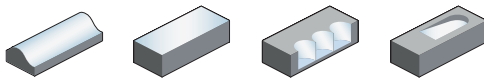


Chip breakers



High feed milling

XMR01 Kr: 15°



S type insert, Weldon shank

Article	* Stock	Dimensions [mm]							Teeth	kg	Inserts
		ØD	ød	a _p	ae	L ₁	L				
XMR01-020-XP20-SD06-02	●	20	20	0.8	5.8	50	130	2	0.26	SDMT06T2	
XMR01-025-XP25-SD06-03	○	25	25	0.8	5.8	60	140	3	0.46		
XMR01-025-XP25-SD09-02	○	25	25	1.4	8.8	60	140	2	0.5	SDMT09T3	
XMR01-032-XP32-SD09-03	○	32	32	1.4	8.8	70	150	3	0.8		
XMR01-035-XP32-SD09-03	●	35	32	1.4	8.8	70	150	3	0.8	SDMT1204	
XMR01-032-XP32-SD12-02	●	32	32	1.8	11.7	70	150	2	0.8		
XMR01-040-XP40-SD12-03	●	40	40	1.8	11.7	70	150	3	1.3	SDMT1505	
XMR01-040-XP40-SD15-02	●	40	40	2.2	14	70	200	2	1.6		




● Ex stock ○ On demand

* With internal cooling



Spare parts					
Insert	SDMT06T2	SDMT09T3	SDMT1204	SDMT1505	
ØD	20-63	25-63	32-100	40-160	
	Clamp		WD-204	WD-204	WD-208
	Screw (clamp)		I60M4*8.4	I60M4*8.4	I60M5*13
	Screw (insert)	I60M2.2*5.5		I60M4*8.4	I60M5*13
	Screw (insert)		I60M3.5*08TT		
	Wrench (clamp)		WT15IP	WT15IP	WT20IP
	Wrench (insert)	WT07IP	WT10IP	WT15IP	WT20IP



SDMT	L	I.C	S	d
06 T2	6.35	6.35	2.58	2.5
09 T3	9.525	9.525	3.97	4
12 04	12.7	12.7	4.76	4.4
15 05	15.875	15.875	5.56	5.5

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

SD** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW									
			P	M	K	N	S	H	P	M	K	N	S	H												
ISO			r	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SDMT06T208-DM	0.8	15						●																	
	SDMT09T312-DM	1.2	15	●					●		●								●							
	SDMT120412-DM	1.2	15	●					●		●								●	●						
	SDMT150520-DM	2	15															○								
	SDMT06T208-PM	0.8	15	●		●										●										
	SDMT09T312-PM	1.2	15						●							●	●									
	SDMT120412-PM	1.2	15						●							●	●									
	SDMT150520-PM	2	15															○								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

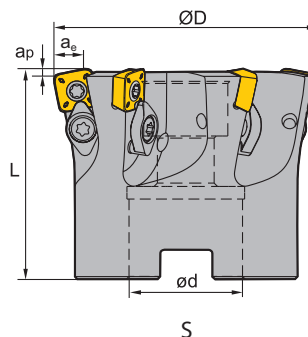
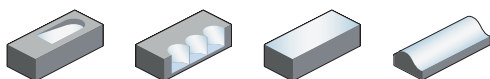
E

Index



High feed milling

XMR01 Kr: 15°



Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
			ØD	ød	ap	ae	L				
XMR01-050-A22-SD06-07		●	50	22	0.8	5.8	40	7	A	0.36	SDMT06T2
XMR01-063-A22-SD06-10		●	63	22	0.8	5.8	40	10	A	0.53	
XMR01-063-A27-SD06-10		●	63	27	0.8	5.8	50	10	A	0.57	
XMR01-040-A16-SD09-04		○	40	16	1.4	8.8	40	4	A	0.182	SDMT09T3
XMR01-050-A22-SD09-04		●	50	22	1.4	8.8	40	4	A	0.3	
XMR01-050-A22-SD09-04C	*	●	50	22	1.4	8.8	40	4	A	0.3	
XMR01-063-A22-SD09-06		●	63	22	1.4	8.8	40	6	A	0.5	
XMR01-063-A22-SD09-06C	*	●	63	22	1.4	8.8	40	6	A	0.5	
XMR01-063-A27-SD09-06		●	63	27	1.4	8.8	50	6	A	0.6	
XMR01-063-A27-SD09-06C	*	○	63	27	1.4	8.8	50	6	A	0.6	
XMR01-063-A22-SD09-07		●	63	22	1.4	8.8	40	7	A	0.44	
XMR01-063-A22-SD12-05		●	63	22	1.8	11.7	40	5	A	0.5	
XMR01-063-A22-SD12-05C	*	●	63	22	1.8	11.7	40	5	A	0.5	
XMR01-063-A27-SD12-05		●	63	27	1.8	11.7	50	5	A	0.6	
XMR01-063-A27-SD12-05C	*	●	63	27	1.8	11.7	50	5	A	0.6	
XMR01-063-A22-SD12-06		●	63	22	1.8	11.7	50	6	A	0.55	SDMT1204
XMR01-066-A27-SD12-05C	*	●	66	27	1.8	11.7	50	5	A	0.56	
XMR01-080-A27-SD12-05		●	80	27	1.8	11.7	63	5	A	0.9	
XMR01-080-A27-SD12-05C	*	●	80	27	1.8	11.7	63	5	A	0.9	
XMR01-080-A27-SD12-06C	*	○	80	27	1.8	11.7	50	6	A	0.9	
XMR01-080-A27-SD12-07		●	80	27	1.8	11.7	50	7	A	0.93	
XMR01-080-A27-SD12-08		●	80	27	1.8	11.7	50	8	A	0.92	
XMR01-100-B32-SD12-06		●	100	32	1.8	11.7	50	6	B	1.8	
XMR01-100-B32-SD12-06C	*	●	100	32	1.8	11.7	50	6	B	1.8	
XMR01-080-A32-SD15-05		○	80	32	2.2	14	50	5	A	0.72	SDMT1505
XMR01-080-A27-SD15-05		○	80	27	2.2	14	50	5	A	0.78	
XMR01-100-B32-SD15-07		○	100	32	2.2	14	50	7	B	1.2	
XMR01-125-B40-SD15-09		○	125	40	2.2	14	63	9	B	2.9	
XMR01-160-B40-SD15-12		○	160	40	2.2	14	63	12	B	4.4	

● Ex stock ○ On demand

* With internal cooling

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

Spare parts

	Insert	SDMT06T2	SDMT09T3	SDMT1204	SDMT1505
	ØD	20-63	25-63	32-100	40-160
	Clamp		WD-204	WD-204	WD-208
	Screw (clamp)		I60M4*8.4	I60M4*8.4	I60M5*13
	Screw (insert)	I60M2.2*5.5		I60M4*8.4	I60M5*13
	Screw (insert)		I60M3.5*08TT		
	Wrench (clamp)		WT15IP	WT15IP	WT20IP
	Wrench (insert)	WT07IP	WT10IP	WT15IP	WT20IP



SDMT	L	I.C	S	d
06 T2	6.35	6.35	2.58	2.5
09 T3	9.525	9.525	3.97	4
12 04	12.7	12.7	4.76	4.4
15 05	15.875	15.875	5.56	5.5

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

SD** milling insert				HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW									
		P	M	K	N	S	H																		
ISO		r	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SDMT06T208-DM	0.8	15																						
	SDMT09T312-DM	1.2	15	●																					
	SDMT120412-DM	1.2	15	●																					
	SDMT150520-DM	2	15																						
	SDMT06T208-PM	0.8	15	●		●																			
	SDMT09T312-PM	1.2	15			●																			
	SDMT120412-PM	1.2	15			●																			
	SDMT150520-PM	2	15				○																		

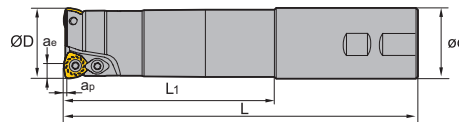
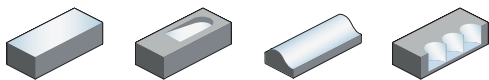
● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



High feed milling

XMR01



W type insert, Weldon shank

Article	* Stock	Dimensions [mm]							Teeth	kg	Inserts
		$\varnothing D$	$\varnothing d$	a_p	a_e	L_1	L				
XMR01-020-XP20-WP05-02-M	○	20	20	1.5	3.8	50	130	2	0.2	WPGT0503	
XMR01-020-XP20-WP05-02-L	●	20	20	1.5	3.8	100	180	2	0.3		
XMR01-020-XP20-WP05-02-XL	●	20	20	1.5	3.8	130	250	2	0.8		
XMR01-025-XP25-WP06-02-M	●	25	25	1.5	4.35	60	140	2	0.4	WPGT0604	
XMR01-025-XP25-WP06-02-L	●	25	25	1.5	4.35	120	200	2	0.6		
XMR01-025-XP25-WP06-02-XL	●	25	25	1.5	4.35	180	300	2	1		
XMR01-032-XP32-WP06-03-M	●	32	32	1.5	4.35	70	150	3	0.8		
XMR01-032-XP32-WP06-03-L	●	32	32	1.5	4.35	120	200	3	1		
XMR01-032-XP32-WP06-03-XL	●	32	32	1.5	4.35	180	300	3	1.6		
XMR01-040-XP32-WP06-03-M	●	40	32	1.5	4.35	50	150	3	0.9	WPGT0806	
XMR01-040-XP32-WP06-03-L	●	40	32	1.5	4.35	50	250	3	1.5		
XMR01-040-XP32-WP06-03-XL	●	40	32	1.5	4.35	50	300	3	1.8		
XMR01-040-XP32-WP08-02-M	●	40	32	1.5	5.66	50	150	2	0.9	WPGT0806	
XMR01-040-XP32-WP08-02-L	●	40	32	1.5	5.66	50	250	2	1.5		
XMR01-040-XP32-WP08-02-XL	●	40	32	1.5	5.66	50	300	2	1.9		

● Ex stock ○ On demand

* With internal cooling

variabler Einstellwinkel (Einstellwinkel ist hier plattengrößenabhängig)- lead angle:
 WPGT05 insert: 16°; WPGT06 insert: 22°; WPGT08 insert: 11°; WPGT09 insert: 21°




System code > B22

Grade selection > B20




Technical info > B447

Cutting data > B216

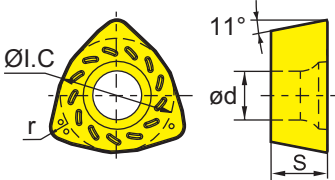


Spare parts

	Insert	WPGT0503	WPGT0604	WPGT0806	
	ØD	20	25-40	40	
	Clamp			WD-208	
	Screw (clamp)			I60M5*13	
	Screw (insert)		I60M4*8.4	I60M5*13	
	Screw (insert)	I60M3.5*08TT			
	Wrench (clamp)			WT20IT	
	Wrench (insert)			WT20IT	
	Wrench (insert)	WT10IP	WT15IP		

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

WPGT	I.C	S	d
05 03	7.94	3.5	4
06 04	9.525	4.2	4.4
08 06	12.85	6.35	5.5

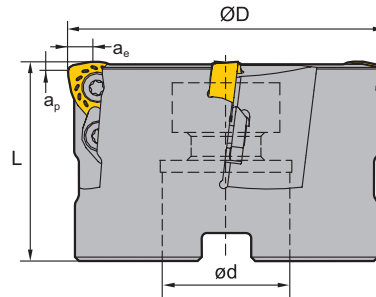
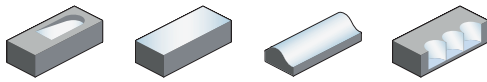
WP** positive insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
 <p>ØI.C r 11° ød S</p>	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	WPGT050315ZSR-PM	1.5																					
	WPGT060415ZSR-PM	1.5	●									●											
	WPGT080615ZSR-PM	1.5	●									●											
	WPGT050315ZSR	1.5	●			●										●							
	WPGT060415ZSR	1.5	●			●						●			●								
	WPGT080615ZSR	1.5	●			●						●			●								

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

High feed milling

XMR01



W type insert, Arbor mounting

Article	*	Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
			ØD	ød	a _p	a _e	L				
XMR01-050-A22-WP06-04		●	50	22	1.5	4.35	50	4	A	0.4	WPGT0604
XMR01-050-A22-WP06-04C	*	●	50	22	1.5	4.35	50	4	A	0.4	
XMR01-050-A22-WP08-03		●	50	22	1.5	5.66	50	3	A	0.4	WPGT0806
XMR01-050-A22-WP08-03C	*	○	50	22	1.5	5.66	50	3	A	0.4	
XMR01-063-A22-WP08-04		●	63	22	1.5	5.66	50	4	A	0.7	
XMR01-063-A27-WP08-04		●	63	27	1.5	5.66	50	4	A	0.7	
XMR01-063-A27-WP08-04C	*	○	63	27	1.5	5.66	50	4	A	0.7	
XMR01-063-A22-WP08-04C	*	●	63	22	1.5	5.66	50	4	A	0.7	
XMR01-080-A27-WP08-05		●	80	27	1.5	5.66	63	5	A	1.5	
XMR01-080-A27-WP08-05C	*	●	80	27	1.5	5.66	63	5	A	1.5	
XMR01-100-B32-WP08-06		●	100	32	1.5	5.66	63	6	B	2.2	
XMR01-100-B32-WP08-06C	*	○	100	32	1.5	5.66	63	6	B	2.2	
XMR01-125-B40-WP08-07		●	125	40	1.5	5.66	63	7	B	3.5	WPGT0907
XMR01-125-B40-WP08-07C	*	●	125	40	1.5	5.66	63	7	B	3.5	
XMR01-160-B40-WP08-08		○	160	40	1.5	5.66	63	8	B	6	
XMR01-160-B40-WP08-08C	*	○	160	40	1.5	5.66	63	8	B	6	
XMR01-063-A22-WP09-03		○	63	22	3	6.8	50	3	A	0.7	WPGT0907
XMR01-063-A22-WP09-03C	*	○	63	22	3	6.8	50	3	A	0.7	
XMR01-080-A27-WP09-04		○	80	27	3	6.8	63	4	A	1.4	
XMR01-080-A27-WP09-04C	*	○	80	27	3	6.8	63	4	A	1.4	
XMR01-100-B32-WP09-05		●	100	32	3	6.8	63	5	B	2.1	
XMR01-100-B32-WP09-05C	*	○	100	32	3	6.8	63	5	B	2.1	
XMR01-125-B40-WP09-06		○	125	40	3	6.8	63	6	B	3.7	
XMR01-125-B40-WP09-06C	*	○	125	40	3	6.8	63	6	B	3.7	
XMR01-160-B40-WP09-07		○	160	40	3	6.8	63	7	B	6.3	
XMR01-160-B40-WP09-07C	*	○	160	40	3	6.8	63	7	B	6.3	

● Ex stock ○ On demand

* With internal cooling


variabler Einstellwinkel (Einstellwinkel ist hier plattengrößenabhängig)- lead angle:
WPGT05 insert: 16°; WPGT06 insert: 22°; WPGT08 insert: 11°; WPGT09 insert: 21°

System code > B22




Grade selection > B20

Technical info > B447

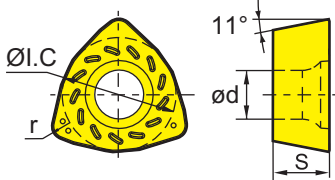


Cutting data > B216

Spare parts					
	Insert	WPGT0604	WPGT0806	WPGT0907	
	ØD	50	50-160	3-160	
	Clamp		WD-208	WD-208	
	Screw (clamp)		I60M5*13	I60M5*13	
	Screw (insert)	I60M4*8.4	I60M5*13	I60M5*13	
	Wrench (clamp)		WT20IT	WT20IT	
	Wrench (insert)		WT20IT	WT20IT	
	Wrench (insert)	WT15IS			

Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

WPGT	I.C	S	d
06 04	9.525	4.2	4.4
08 06	12.85	6.35	5.5
09 07	15	7	5.5

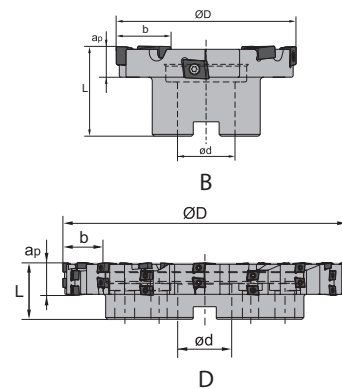
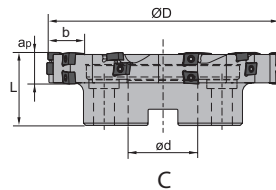
WP** positive insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO	r		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	WPGT060415ZSR-PM	1.5	●											●										
	WPGT080615ZSR-PM	1.5	●											●										
	WPGT090725ZSR-PM	2.5												●										
	WPGT060415ZSR	1.5	●				●							●	●									
	WPGT080615ZSR	1.5	●				●							●	●									
	WPGT090725ZSR	2.5					●							●	○									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Bore milling

XMP01 Kr: 90°






Article	* Stock	Dimensions [mm]					Teeth	Coupling	kg	Inserts
		ØD	ød	b	ap	L				
XMP01-080*18-B27-CNE1210-08	●	80	27	18	15	50	8	B	0.67	CNE12
XMP01-100*18-B32-CNE1210-08	●	100	32	18	20	50	8	B	0.99	
XMP01-125*27-B40-CNE1210-15	●	125	40	27	22.5	63	15	B	2.46	
XMP01-160*27-C40-CNE1210-18	●	160	40	27	25	63	18	C	3.7	
XMP01-200*27-C60-CNE1210-21	●	200	60	27	31.5	63	21	C	5.46	
XMP01-250*36-C60-CNE1210-32	●	250	40	36	56.5	63	32	C	9.79	
XMP01-315*36-D60-CNE1210-42	●	315	60	36	47.5	63	42	D	17.65	
XMP01-400*36-D60-CNE1210-52	●	400	60	36	36	63	52	D	27.36	

● Ex stock ○ On demand

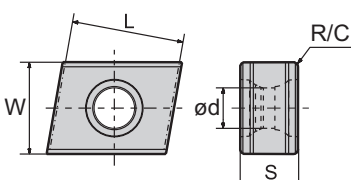


* With internal cooling

Spare parts		
Insert	CNE12	
ØD	80-400	
 Screw (insert)	I60M4*12	
 Wrench (insert)	WT15IP	

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

CNE	L	S	d
12	12.8	6.35	4.4

Milling inserts

CN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT		HC ²		HW							
			P	M	K	N	S	H																		
ISO			R/C	W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	CNE121006A	0.4	10				●																			
	CNE121006B	0.6	10				○		●																	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

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Milling

C

Drilling

D

Technical Information

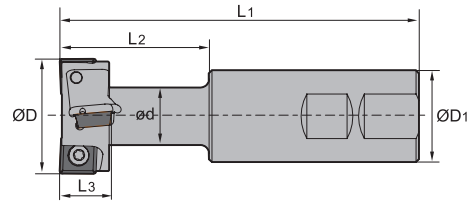
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T-slot milling

TMP01 Kr: 90°






Weldon shank

Article	* Stock	Dimensions [mm]							Teeth	No. of inserts	T-slot specification	Inserts 
		ØD	ØD ₁	ød	L ₁	L ₂	L ₃					
TMP01-021-XP25-MP06-01	●	21	25	10	100	32	9	1	2	12	MPHT0606	
TMP01-025-XP25-MP06-01	●	25	25	12	100	35	11	1	2	14		
TMP01-032-XP32-MP08-02	●	32	32	15	110	45	14	2	4	18	MPHT0803	
TMP01-040-XP32-MP12-02	●	40	32	19	125	55	18	2	4	22	MPHT1204	
TMP01-050-XP40-MP12-02	●	50	40	25	140	65	22	2	4	28		
TMP01-060-XP50-MP12-02	●	60	50	32	160	80	28	2	6	36		

● Ex stock ○ On demand




* With internal cooling

Spare parts

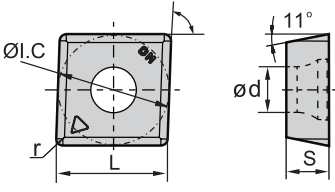

	Insert ØD	MPHT0606 21-25	MPHT0803 32	MPHT1204 40-60
 Screw (insert)		I60M2.5*5.5	I60M3*7	I60M5*10
 Wrench (insert)		WT07IP	WT09IP	
 Wrench (insert)				WT20IT



MPHT	L	I.C	S	d
06 03	6.35	6.35	3.18	2.8
08 03	8.3	8.3	3.18	3.4
12 04	12.7	12.7	4.76	5.56

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

MP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW								
	P																					
	M																					
	K																					
	N																					
	S																					
	H																					
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	MPHT060304-DM	0.4	●			●									●							
	MPHT080305-DM	0.5	●			●									●							
	MPHT120408-DM	0.8	●			○		●							●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

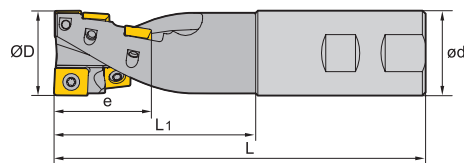
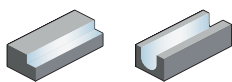
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Helical milling

HMP01 Kr: 90°



Weldon shank

Article	*	Stock		Dimensions [mm]					Teeth row	Teeth		Shank type	Inserts
		R	L	ØD	e	ød	L ₁	L		APKT	SPMT		
HMP01-040x55-XP40-SP12-02	● ○	40	55	40	95	175	2	1	5	Weldon	APKT1504 & SPMT1204		
HMP01-050x55-XP40-SP12-04	● ○	50	55	40	95	175	4	2	10	Weldon	APKT1504 & SPMT1204		

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	APKT1504 & SPMT1204	APKT1504 & SPMT1204	
	ØD	40	50	
Screw (insert)		I60M5*10	I60M5*13	
Wrench (insert)		WT20T	WT20T	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
15 04	16.33	4.76	5.4

Milling inserts

AP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
			P	M	K	N	S	H																	
ISO			r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	APKT150412-KM	1.2	12.7																						
	APKT150412-PM	1.2	12.7																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
			P	M	K	N	S	H																
ISO			r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SPMT120408-KM	0.8																						
	SPMT120408-PM	0.8																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

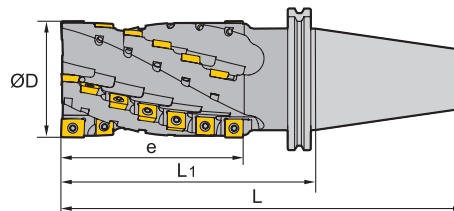
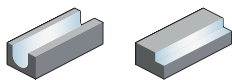
Technical info > B447


Cutting data > B216



Helical milling




HMP01 Kr: 90°



Article	*	Stock		Dimensions [mm]				Teeth row	Teeth		Shank type	Inserts 
		R	L	ØD	e	L ₁	L		APKT	SPMT		
HMP01-050x84-BT50-SP12-04	○	○	○	50	84	145	246.8	4	2	16	BT	APKT1504 & SPMT1204
HMP01-050x84-JT50-SP12-04	○	○	○	50	84	145	246.75	4	2	16	JT	
HMP01-063x74-BT50-SP12-04	○	○	○	63	74	135	236.8	4	2	14	BT	
HMP01-063x74-JT50-SP12-04	○	○	○	63	74	135	236.75	4	2	14	JT	
HMP01-063x104-BT50-SP12-04	○	○	○	63	104	165	266.8	4	2	20	BT	
HMP01-063x104-JT50-SP12-04	●	○	○	63	104	165	266.75	4	2	20	JT	
HMP01-063x134-BT50-SP12-04	○	○	○	63	134	195	296.8	4	2	26	BT	
HMP01-063x134-JT50-SP12-04	○	○	○	63	134	195	296.75	4	2	26	JT	
HMP01-080x104-BT50-SP12-04	○	○	○	80	104	165	266.8	4	2	20	BT	
HMP01-080x104-JT50-SP12-04	○	○	○	80	104	165	266.75	4	2	20	JT	
HMP01-080x144-BT50-SP12-04	○	○	○	80	144	205	306.8	4	2	28	BT	
HMP01-080x144-JT50-SP12-04	○	○	○	80	144	205	306.75	4	2	28	JT	

● Ex stock ○ On demand

* With internal cooling

Spare parts			
Insert	APKT1504 & SPMT1204		
ØD	50-80		
 Screw (insert)	I60M5*10		
 Wrench (insert)	WT20IS		

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
15 04	16.33	4.76	5.4

Milling inserts

AP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW									
			P	M	K	N	S	H																	
ISO			r	I.W.	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	APKT150412-KM	1.2	12.7																						
	APKT150412-PM	1.2	12.7																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
			P	M	K	N	S	H																
ISO			r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	SPMT120408-KM	0.8																						
	SPMT120408-PM	0.8																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



A

Turning

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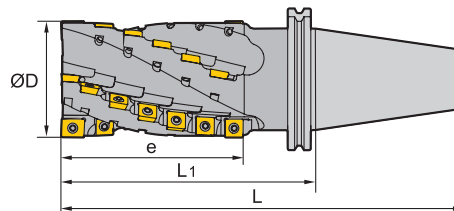
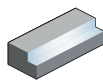
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Helical milling






HMP01 EC Kr: 90°



Article	*	Stock		Dimensions [mm]				Teeth row	Teeth		Shank type	Inserts 
		R	L	ØD	e	L ₁	L		APKT	SPMT		
HMP01-050x84EC-BT50-SP12-04	○	○		50	84	145	246.8	4	2	16	BT	APKT1504 & SPMT1204
HMP01-050x84EC-JT50-SP12-04	●	○		50	84	145	246.75	4	2	16	JT	
HMP01-063x74EC-BT50-SP12-04	○	○		63	74	135	236.8	4	2	14	BT	
HMP01-063x74EC-JT50-SP12-04	○	○		63	74	135	236.75	4	2	14	JT	
HMP01-063x104EC-BT50-SP12-04	○	○		63	104	165	266.8	4	2	20	BT	
HMP01-063x104EC-JT50-SP12-04	○	○		63	104	165	266.75	4	2	20	JT	
HMP01-063x134EC-BT50-SP12-04	○	○		63	134	195	296.8	4	2	26	BT	
HMP01-063x134EC-JT50-SP12-04	●	○		63	134	195	296.75	4	2	26	JT	
HMP01-080x104EC-BT50-SP12-04	○	○		80	104	165	266.8	4	2	20	BT	
HMP01-080x104EC-JT50-SP12-04	○	○		80	104	165	266.75	4	2	20	JT	
HMP01-080x144EC-BT50-SP12-04	○	○		80	144	205	306.8	4	2	28	BT	
HMP01-080x144EC-JT50-SP12-04	○	○		80	144	205	306.75	4	2	28	JT	

● Ex stock ○ On demand

* With internal cooling

Spare parts				
	Insert	APKT1504 & SPMT1204	APKT1504 & SPMT1204	APKT1504 & SPMT1204
	ØD	50	63	80
	Indexable head	050EC	063EC	080EC
	Screw (head)	M10*50	M10*50	M12*55
	Screw (insert)	I60M5*13	I60M5*13	I60M5*13
	Wrench (head)	WH80L	WH80L	WH100L
	Wrench (insert)	WT20IS	WT20IS	WT20IS



System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

APKT	L	S	d
15 04	16.33	4.76	5.4

Milling inserts

AP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW											
			P	M	K	N	S	H																		
ISO			r	I.W.	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	APKT150412-KM	1.2	12.7																							
	APKT150412-PM	1.2	12.7																							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

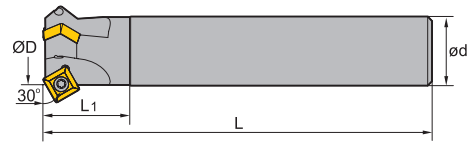
SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
			P	M	K	N	S	H																	
ISO			r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408-KM	0.8																							
	SPMT120408-PM	0.8																							

● Ex stock ○ On demand


HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

Chamfer milling

CMZ01 Kr: 30°






Straight shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMZ01-012-G20-SP12-01		●	12	20	40	100	1	0.2	 SPMT1204
CMZ01-025-G25-SP12-02		●	25	25	40	120	2	0.8	
CMZ01-032-G32-SP12-03		●	32	32	40	180	3	1.1	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	SPMT1204	
	ØD	12-32	
 Screw (insert)		I43M5*11	
 Wrench (insert)		WT20IS	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408	0.8																					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

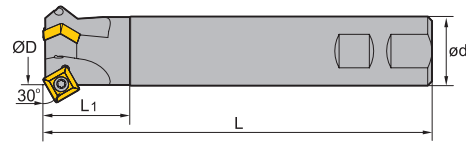
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Chamfer milling

CMZ01 Kr: 30°



Weldon shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMZ01-012-XP20-SP12-01		●	12	20	40	100	1	0.2	SPMT1204
CMZ01-025-XP25-SP12-02		●	25	25	40	120	2	0.6	
CMZ01-032-XP32-SP12-03		●	32	32	40	180	3	1	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	SPMT1204	
	ØD	12-32	
	Screw (insert)	I43M5*11	
	Wrench (insert)	WT20IS	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

A

Turning

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Drilling

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Technical Information

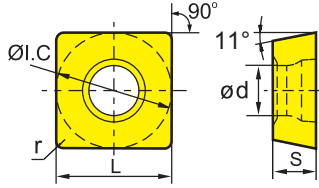

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
 SPMT120408	0.8	○	●	○	●	●										●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

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System code > B22

Grade selection > B20

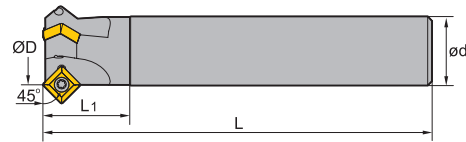
Technical info > B447

Cutting data > B216




Chamfer milling

CMA01 Kr: 45°






Straight shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMA01-012-G20-SP12-01		●	12	20	40	100	1	0.2	 SPMT1204
CMA01-025-G25-SP12-02		●	25	25	40	120	2	0.8	
CMA01-032-G32-SP12-03		●	32	32	40	180	3	1.1	

● Ex stock ○ On demand

* With internal cooling

Spare parts




	Insert	SPMT1204	
	ØD	12-32	
 Screw (insert)		I43M5*11	
 Wrench (insert)		WT20IS	

System code > B22

Grade selection > B20

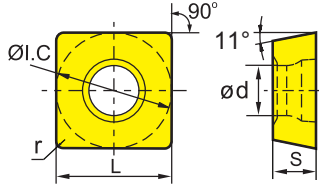

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408	0.8	○	●	○	●	●									●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



Chamfer milling

CMA01 Kr: 45°



Weldon shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMA01-012-XP20-SP12-01		●	12	20	40	100	1	0.2	SPMT1204
CMA01-025-XP25-SP12-02		●	25	25	40	120	2	0.6	
CMA01-032-XP32-SP12-03		●	32	32	40	100	3	1	

● Ex stock ○ On demand

* With internal cooling

Spare parts		
	Insert	SPMT1204
	ØD	12-32
	Screw (insert)	I43M5*11
	Wrench (insert)	WT20IS



A

Turning

B

Milling

C




Drilling

D

Technical Information

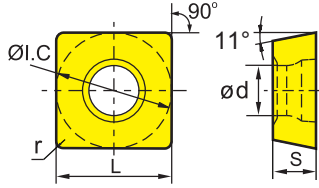

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408	0.8	○	●	○	●	●									●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

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System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216




Chamfer milling

CMD01 Kr: 60°






Straight shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMD01-012-G20-SP12-01		●	12	20	40	100	1	0.2	 SPMT1204
CMD01-025-G25-SP12-02		●	25	25	40	120	2	0.8	
CMD01-036-G32-SP12-03		●	36	32	40	180	3	1	

● Ex stock ○ On demand

* With internal cooling

Spare parts




	Insert	SPMT1204	
	ØD	12-36	
 Screw (insert)		I43M5*11	
 Wrench (insert)		WT20IS	

System code > B22

Grade selection > B20

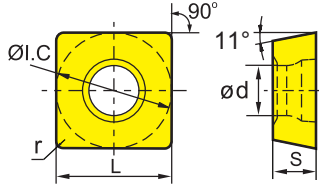

Technical info > B447

Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408	0.8																					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

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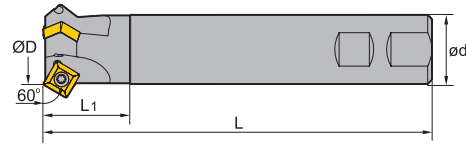
Technical info > B447

Cutting data > B216




Chamfer milling

CMD01 Kr: 60°






Weldon shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMD01-012-XP20-SP12-01		●	12	20	40	100	1	0.2	 SPMT1204
CMD01-025-XP25-SP12-02		●	25	25	40	120	2	0.6	
CMD01-036-XP32-SP12-03		●	36	32	40	180	3	1	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	SPMT1204	
	ØD	12-36	
	Screw (insert)	I43M5*11	
	Wrench (insert)	WT20IS	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMT120408	0.8	○	●	○	●	●									●							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

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Milling

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System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

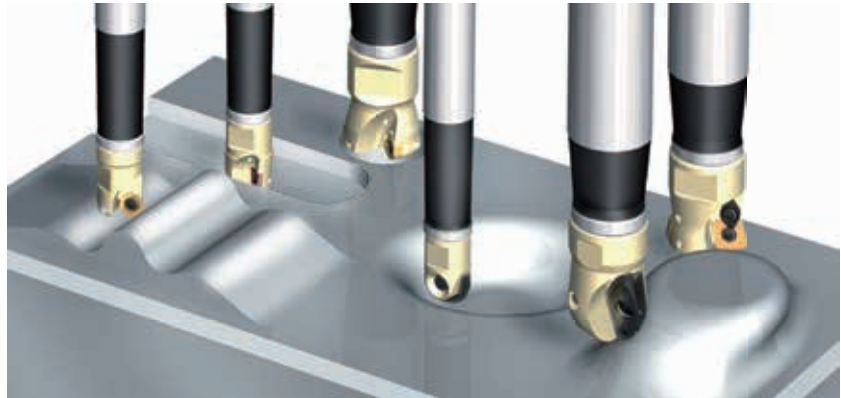


QCH series

Indexable heads

- Quick tool change reduces the set-up time and therefore the machine breakdown.
- Stable force-locking connection.
- Increased flexibility in production.
- All indexable heads are designed for the application with inner cooling (except QCH-ZOHX).

Machining operations



Force-locking connection

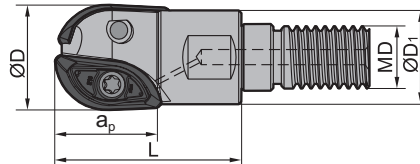
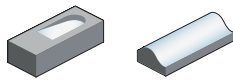


- Extensions available in steel and solid carbide.



Profile milling

QCH - XPHT



Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	ØD ₁	a _p	L	MD			
QCH-16-XPHT16-M10	●		16	17	16	28	10	2	0.036	XPHT16
QCH-20-XPHT20-M12	●		20	19	20	30	12	2	0.051	XPHT20
QCH-25-XPHT25-M12	●		25	24	25	35	12	2	0.071	XPHT25
QCH-30-XPHT30-M16	●		30	29	30	45	16	2	0.14	XPHT30
QCH-32-XPHT32-M16	●		32	30	32	45	16	2	0.162	XPHT32

● Ex stock ○ On demand

* With internal cooling

Spare parts							
Insert	XPHT16	XPHT20	XPHT25	XPHT30	XPHT32		
ØD	16	20	25	30	32		
Screw (insert)		I60M3.5*08TT					
Screw (insert)	I60M2.5*6.5		I60M4*10	I60M5*13.2	I60M5*13.2		
Wrench (insert)				WT20IT	WT20IT		
Wrench (insert)			WT15S				
Wrench (insert)		WT10IP					
Wrench (insert)	WT07P						




System code > B22

Grade selection > B20

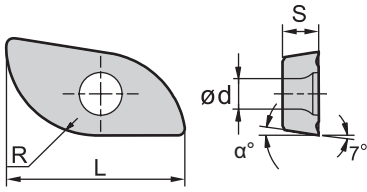
Technical info > B447

Cutting data > B216

XPHT	L	S	d
16	16	3.18	3.1
20	20	3.97	4
25	25	4.76	4.7
30	30	6.35	5.8
32	32	6.35	5.8

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

XP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW								
ISO			R	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	P																								
	M																								
	K																								
	N																								
	S																								
	H																								
			8	9																					
			10	9																					
			12.5	9																					
			15	11																					
			16	9																					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

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Drilling

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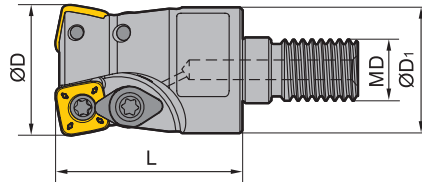
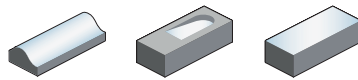
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High-feed mills

QCH - SDMT Kr: 15°



Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ØD ₁	L	MD			
QCH-20-SDMT06-M10-03		○	20	19	30	10	3	0.058	SDMT06T2
QCH-25-SDMT06-M12-04		○	25	24	35	12	4	0.097	
QCH-32-SDMT06-M16-05		○	32	30	45	16	5	0.183	
QCH-25-SDMT09-M12-02		○	25	24	35	12	2	0.088	SDMT09T3
QCH-30-SDMT09-M16-03		●	30	29	45	16	3	0.176	
QCH-35-SDMT09-M16-03		●	35	30	45	16	3	0.216	
QCH-32-SDMT12-M16-02		●	32	30	45	16	2	0.175	SDMT1204
QCH-35-SDMT12-M16-02		●	35	30	45	16	2	0.2	
QCH-40-SDMT12-M16-03		●	40	30	45	16	3	0.3	

● Ex stock ○ On demand

* With internal cooling

Spare parts					
	Insert	SDMT06T2	SDMT09T3	SDMT1204	
	ØD	20-35	25-35	32-40	
	Clamp		WD-204	WD-204	
	Screw (clamp)		I60M3.5*08TT		
	Screw (clamp)			I60M4*8.4	
	Screw (insert)	I60M2.2*5.5	I60M4*8.4	I60M4*8.4	
	Wrench (clamp)		WT10IP	WT15IP	
	Wrench (insert)	WT07IP	WT15IP	WT15IP	




System code > B22

Grade selection > B20

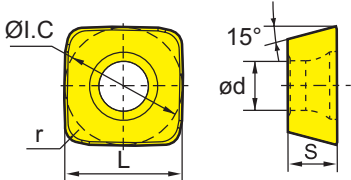


Technical info > B447

Cutting data > B216

SDMT	L	I.C	S	d
06 T2	6.35	6.35	2.58	2.5
09 T3	9.525	9.525	3.97	4
12 04	12.7	12.7	4.76	4.4

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

SD** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW											
			P	M	K	N	S	H																		
 <p>ØI.C r L 15° ød S</p>	ISO		r	α	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
		SDMT06T208-DM	0.8	15						●							●									
		SDMT09T312-DM	1.2	15	●					●		●						●	●							
		SDMT120412-DM	1.2	15	●					●		●						●	●							
		SDMT06T208-PM	0.8	15	●		●										●									
		SDMT09T312-PM	1.2	15			●										●	●								
	SDMT120412-PM	1.2	15			●										●	●									

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

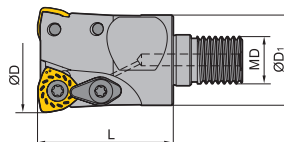
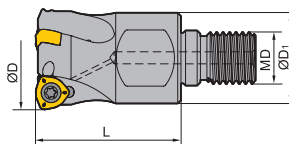
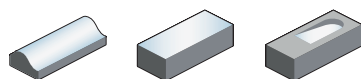
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High-feed mills

QCH - WPGT



Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ØD ₁	L	MD			
QCH-20-WPGT05-M10-02		○	20	18	30	10	2	0.056	WPGT0503
QCH-25-WPGT06-M12-02		○	25	21	35	12	2	0.097	
QCH-32-WPGT06-M16-03		●	32	29	43	16	3	0.185	
QCH-35-WPGT06-M16-03		●	35	30	45	16	3	0.201	WPGT0604
QCH-42-WPGT06-M16-04		○	42	29	43	16	4		
QCH-35-WPGT08-M16-02		●	35	30	45	16	2	0.196	WPGT0806

● Ex stock ○ On demand




* With internal cooling

variabler Einstellwinkel (Einstellwinkel ist hier plattengrößenabhängig)- lead angle:
 WPGT05 insert: 16°; WPGT06 insert: 22°; WPGT08 insert: 11°; WPGT09 insert: 21°

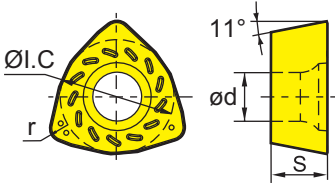


Spare parts				
	Insert	WPGT0503	WPGT0604	WPGT0806
	ØD	20	25-42	35
	Clamp			WD-208
	Screw (clamp)			I60M5*13
	Screw (insert)		I60M4*8.4	I60M5*13
	Screw (insert)	I60M3.5*08TT		
	Wrench (clamp)			WT20IT
	Wrench (insert)			WT20IT
	Wrench (insert)	WT10P	WT15P	



Milling inserts

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

WPGT	I.C	S	d
05 03	7.94	3.5	4
06 04	9.525	4.2	4.4
08 06	12.85	6.35	5.5

WP** positive insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW						
	P																						
	M																						
	K																						
	N																						
	S																						
	H																						
ISO	r		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	WPGT050315ZSR-PM	1.5												●									
	WPGT060415ZSR-PM	1.5	●											●									
	WPGT080615ZSR-PM	1.5	●											●									
	WPGT050315ZSR	1.5	●				●								●								
	WPGT060415ZSR	1.5	●				●							●	●								
	WPGT080615ZSR	1.5	●				●							●	●								

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

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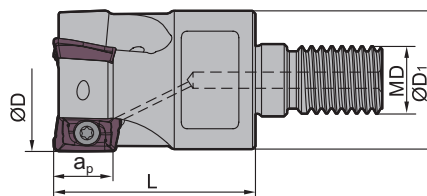
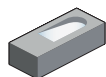
Technical Information

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Indexable heads – QCH series

QCH - APKT Kr: 90°



Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	ØD ₁	a _p	L	MD			
QCH-16-APKT11-M8-02	●		16	12.5	10.5	25	8	2	0.028	APKT11T3
QCH-20-APKT11-M10-03	●		20	18	10.5	30	10	3	0.059	
QCH-25-APKT11-M12-04	●		25	21	10.5	35	12	4	0.104	
QCH-32-APKT11-M16-05	●		32	29	10.5	43	16	5		
QCH-40-APKT11-M16-06	●		40	29	10.5	43	16	6		
QCH-25-APKT16-M12-02	○		25	21	10.5	38	12	2	0.09	
QCH-32-APKT16-M16-03	●		32	29	10.5	46	16	3		
QCH-40-APKT16-M16-04	●		40	29	10.5	46	16	4		

● Ex stock ○ On demand

* With internal cooling




Spare parts				
Insert	APKT11T3	APKT1604		
ØD	16-40	25-40		
Screw (insert)		I60M4*8.4		
Screw (insert)	I60M2.5*6.5T			
Wrench (insert)	WT08IP	WT15IP		

System code > B22

Grade selection > B20

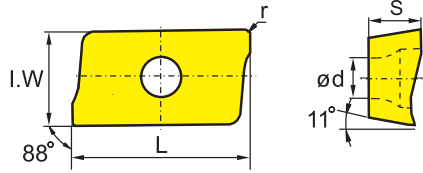
Technical info > B447







Cutting data > B216

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

Milling inserts



APKT** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
ISO	r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	APKT11T304-ALH	0.4	6.5																					
	APKT11T308-ALH	0.8	6.5																					
	APKT160408-ALH	0.8	9.33																					
	APKT11T304-APF	0.4	6.5																					
	APKT11T308-APF	0.8	6.5																					
	APKT160408-APF	0.8	9.33																					
	APKT11T304-APM	0.4	6.5																					
	APKT11T308-APM	0.8	6.5																					
	APKT11T312-APM	1.2	6.5																					
	APKT11T316-APM	1.6	6.5																					
	APKT11T320-APM	2	6.5																					
	APKT160408-APM	0.8	9.33																					
	APKT160416-APM	1.6	9.33																					
	APKT160420-APM	2	9.33																					
	APKT160424-APM	2.4	9.33																					
APKT160430-APM	3	9.33																						
	APKT11T304-LH	0.4	6.5																					
	APKT11T308-LH	0.8	6.5																					
	APKT160408-LH	0.8	9.33																					
	APKT11T304-PF	0.4	6.5																					
	APKT11T308-PF	0.8	6.5																					
	APKT11T312-PF	1.2	6.5																					
	APKT11T316-PF	1.6	6.5																					
	APKT160408-PF	0.8	9.33																					
	APKT160430-PF	3	9.33																					
	APKT11T304-PM	0.4	6.5																					
	APKT11T308-PM	0.8	6.5																					
	APKT11T312-PM	1.2	6.5																					
	APKT11T316-PM	1.6	6.5																					
	APKT160408-PM	0.8	9.33																					
	APKT160416-PM	1.6	9.33																					

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

A

Turning

B

Milling

C




Drilling

D

Technical Information

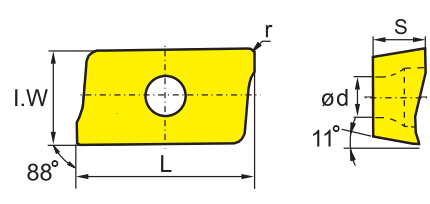

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-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

APKT	L	S	d
11 T3	12.24	3.6	2.8
16 04	17.877	5.76	4.4

Milling inserts

AP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW										
				P	M	K	N	S	H																	
																										
ISO				r	I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201
	APKT11T304-PR	0.4	6.5																							
	APKT11T308-PR	0.8	6.5																							
	APKT11T312-PR	1.2	6.5																							
	APKT11T316-PR	1.6	6.5																							
	APKT160408-PR	0.8	9.33																							

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

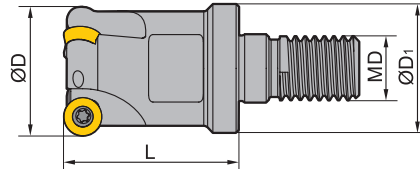
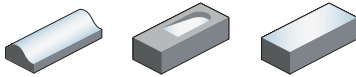
Grade selection > B20

Technical info > B447

Cutting data > B216

Indexable heads – QCH series

QCH - RD



Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ØD ₁	L	MD			
QCH-16-RD07-M8-02		○	16	15	25	8	2	0.027	RDKW0702
QCH-20-RD07-M10-03		○	20	18	30	10	3	0.058	
QCH-25-RD07-M12-03		○	25	21	35	12	3	0.093	
QCH-20-RD10-M10-02		○	20	19	30	10	2	0.054	RDKW10T3
QCH-25-RD10-M12-02		○	25	24	35	12	2	0.097	
QCH-32-RD10-M16-03		○	32	30	45	16	3	0.183	
QCH-32-RD16-M16-02		●	32	30	45	16	2	0.156	RDKW1605

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	RDKW0702 16-25	RDKW10T3 20-32	RDKW1605 32	
	Screw (insert)	I60M2.5*6.5T			
	Screw (insert)		I60M4*8	I60M5*13	
	Wrench (insert)	WT08IP	WT15IP		
	Wrench (insert)			WT20IT	

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

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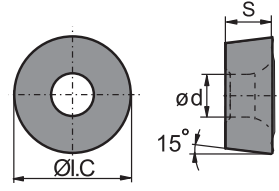


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RDKW	I.C	S	d
07 02	7	2.38	2.7
10 T3	10	3.97	4.4
16 05	16	5.56	5.5

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

RD** milling insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
		P	M	K	N	S	H																
		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RDKW10T3MO	●	●							●													
	RDKW1605MO					○							●	○	●								
	RDKW0702MO-1					●							●										
	RDKW0702MO-2									●													

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

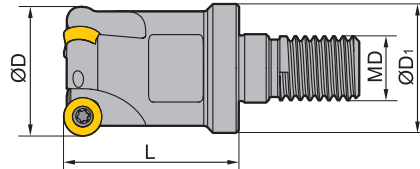
Technical info > B447

Cutting data > B216



Indexable heads – QCH series

QCH - RD



Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ØD ₁	L	MD			
QCH-15-RDKW0702-M8-02		●	15	12.5	23	8	2	RDKW0702	
QCH-15-RDKW0702-M8-03		●	15	12.5	23	8	3		
QCH-20-RDKW0702-M10-04		●	20	18	30	10	4		
QCH-25-RDKW0702-M12-05		●	25	21	35	12	5		
QCH-20-RDKW1003-M10-02		●	20	18	30	10	2	RDKW1003	
QCH-25-RDKW1003-M12-02		●	25	21	35	12	2		
QCH-25-RDKW1003-M12-03		●	25	21	35	12	3		
QCH-30-RDKW1003-M16-04		●	30	29	43	16	4		
QCH-35-RDKW1003-M16-04		●	35	29	43	16	4		
QCH-42-RDKW1003-M16-05		●	42	29	43	16	5		
QCH-24-RDKW12T3-M12-02		●	24	21	35	12	2	RDKW12T3	
QCH-35-RDKW12T3-M16-03		●	35	29	43	16	3		
QCH-42-RDKW12T3-M16-04		●	42	29	43	16	4		
QCH-32-RDKW1604-M16-02		●	32	29	43	16	2	RDKW1604	

● Ex stock ○ On demand

* With internal cooling

Spare parts					
	Insert	RDKW0702	RDKW1003	RDKW12T3	RDKW1604
	ØD	15-25	20-42	24-42	32
	Clamp				WX16N
	Screw (clamp)			LOM3.5*7.1	
	Screw (clamp)				I60M4.5*10
	Screw (insert)	I60M2.2*5.5	I60M3.5*7.7	I60M3.5*7.7	I60M4.5*10
	Wrench (insert)	WT07P	WT15P	WT15P	
	Wrench (insert)				WT20T

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216

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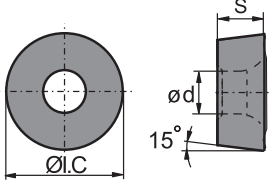
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RDKW	I.C	S	d
07 02	7	2.38	2.7
10 03	10	3.18	3.9
12 T3	12	3.97	3.9
16 04	16	4.76	5.2

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

RD** milling insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
		P	M	K	N	S	H																
ISO		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	RDKW0702MO-1																						
	RDKW0702MO-2																						
	RDKW1003MO-1																						
	RDKW1003MO-2																						
	RDKW1003MO-3																						
	RDKW12T3MO-1																						
	RDKW12T3MO-2																						
	RDKW12T3MO-3																						
	RDKW1604MO-1																						
	RDKW1604MO-2																						
	RDKW1604MO-3																						



● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

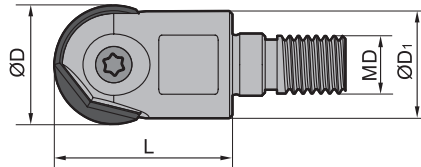
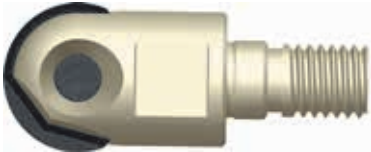
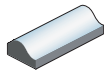
Technical info > B447

Cutting data > B216



Indexable heads – QCH series

QCH - ZOHX



Article	*	Stock	Dimensions [mm]				kg	Inserts
			ØD	ØD ₁	L	MD		
QCH-16-ZOHX16-M8	●		16	15	28	16	0.029	ZOHX16
QCH-20-ZOHX20-M10	●		20	19	30	20	0.048	ZOHX20
QCH-25-ZOHX25-M12	●		25	24	35	25	0.087	ZOHX25
QCH-30-ZOHX30-M16	●		30	29	45	30	0.17	ZOHX30
QCH-32-ZOHX32-M16	●		32	30	45	32	0.18	ZOHX32

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert ØD	ZOHX16 16	ZOHX20 20	ZOHX25 25	ZOHX30 30	ZOHX32 32	
	Screw (insert)	I70M5*12TT	I70M5*16TT	I70M6*20TT	I70M8*25TT	I70M8*25TT	
	Wrench (insert)				WT30IT	WT30IT	
	Wrench (insert)	WT20IP	WT20IP	WT20IP			

System code > B22

Grade selection > B20

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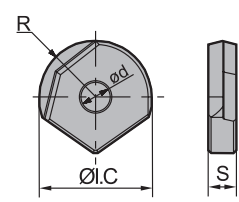


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ZOHX	I.C	S	d
16	16	4	5
20	20	5	5
25	25	6	6
30	30	7	8
32	32	7	8

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavourable machining conditions

Milling inserts

ZO** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW									
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
	ISO	R	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	ZOHX1604-GF	8																						
	ZOHX2005-GF	10																						
	ZOHX2506-GF	12.5																						
	ZOHX3007-GF	15																						
	ZOHX3207-GF	16																						
	ZOHX1604-GM	8																						
	ZOHX2005-GM	10																						
	ZOHX2506-GM	12.5																						
	ZOHX3007-GM	15																						
	ZOHX3207-GM	16																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > B22

Grade selection > B20

Technical info > B447

Cutting data > B216



- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

HNGX	L	I.C	S
09 05	9.16	15.875	5.56

Milling inserts

HN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
		P	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
		M	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
		K							●						●		●							
		N							●							●	●							
		S		●		●			●	●	●	●												
		H																						
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
HDR	HNGX090530-HDR	3						○	○															
MR	HNGX090516-MR	1.6						●																
	HNGX090520-MR	2						●																

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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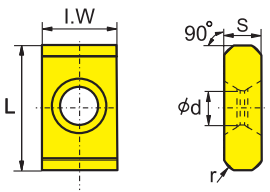

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- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

LNE3	I.W	L	S	d
2.30	4.76	15.875	9.525	4.2

Milling inserts

LN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW							
	P		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●	●	●						
	M		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●	●							
	K								⊗	⊗	⊗	⊗	⊗	⊗			⊗						
	N								⊗							⊗	⊗						
	S			⊗	⊗				⊗	⊗	⊗	⊗					⊗						
	H																						
ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNE32.302	45Fase							●														

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

LNE3	I.W	L	S	d
2.53	4.76	15.875	9.525	4.4

Milling inserts

LN** milling insert		HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW								
		P	M	K	N	S	H	P	M	K	N	S	H											
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNE32.534	1.6						○	●	○														

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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- Ideal machining conditions
- Normal machining conditions
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LNCX	I.W	L	S
18 06	10	24	6.4

Milling inserts

LN** milling insert		HC ¹ (CVD)							HC ¹ (PVD)					HT	HC ²	HW							
		P	M	K	N	S	H																
		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
ISO																							
bs		YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	LNCX1806AZL	2.0																					
	LNCX1806AZR	2.0	○																			○	
	LNCX1806AZT11L	2.0						●															
	LNCX1806AZT11R	2.0						●															

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



Milling inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

SNKN	L	I.C	S
12 04	12.7	12.7	4.76
15 04	15.875	15.875	4.76
19 04	19.05	19.05	4.76

SN** milling insert			HC ¹ (CVD)						HC ¹ (PVD)				HT	HC ²	HW												
	P	M	K	N	S	H																					
	ISO			bs	be	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SNKN1204ENN	1.5	0.9	●		●	●																				
	SNKN1504ENN	1.5	0.9	●		○																					○
	SNKN1904ENN	1.5	1.0																								○

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

SP**	L	I.C	S
12 03	12.7	12.7	1.4
15 04	15.875	15.875	1.4

Milling inserts

SP** milling insert		HC ¹ (CVD)								HC ¹ (PVD)					HT	HC ²	HW									
		P	M	K	N	S	H																			
	ISO	bs	be	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
		SPAN1203EDEL	3.2	1.0	●																					
		SPAN1203EDER	3.2	1.0	●																					
		SPAN1203EDFL	3.2	1.0																					○	
		SPAN1203EDFR	3.2	1.0																					●	
SPAN1203EDL		3.2	1.0																					○		
SPAN1203EDR		3.2	1.0																					○		
SPAN1504EDFL		4.8	1.0																					○		
SPAN1504EDFR		4.8	1.0																					○		
	SPCN1203EDSKR	3.2	1.0	●																						
	SPCN1504EDSKR	4.8	1.0	●																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



SPMR	L	I.C	S
09 03	9.525	9.525	3.18
09 T3	9.525	9.525	3.97
12 03	12.7	12.7	3.18

- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

Milling inserts

SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW							
	P	●	●	●	●	●	●	●	●	●	●	●	●	●	●									
	M	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗									
	K						⊗	⊗					⊗	⊗		⊗								
	N							⊗							⊗	⊗								
	S			⊗		⊗			⊗	⊗	⊗	⊗												
	H																							
	ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPMR090304	0.4				●																		
	SPMR090308	0.8				●																		
	SPMR09T304	0.4					●																	
	SPMR120304	0.4					●																	
	SPMR120308	0.8					●	●																
	SPMR120312	1.2						●																

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

SPMT	L	I.C	S	d
06 03	6.35	6.35	3.18	2.8
09 T3	9.525	9.525	3.97	4.4
12 04	12.7	12.7	4.76	5.5

Milling inserts

SP** milling insert			HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW								
		P	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●	●	●							
		M	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●	●	●							
		K							⊗						●	●	●							
		N							⊗							⊗	⊗							
		S			⊗	⊗			⊗	⊗	⊗	⊗												
		H																						
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
HT-1	SPMT120408-HT-1	0.8													○									
HT	SPMT09T308-HT	0.8				●			●						●									
KT	SPMT060304-KT	0.4		●																				

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > A194

Grade selection > A38

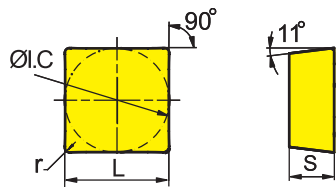
Technical info > A445

Cutting data > A324

SP**	L	I.C	S
09 03	9.525	9.525	3.18
12 03	12.7	12.7	3.18
12 04	12.7	12.7	4.76
15 04	15.875	15.875	4.76
19 04	19.05	19.05	4.76

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts



SP** milling insert			HC ¹ (CVD)					HC ¹ (PVD)					HT	HC ²	HW								
			P	M	K	N	S	H															
	ISO	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	SPGN090304	0.4																					
	SPGN090308	0.8																					
	SPGN120304	0.4																					
	SPGN120308	0.8																					
	SPGN120404	0.4																					
	SPGN120408	0.8																					
	SPGN120412	1.2																					
	SPGN150404	0.4																					
	SPGN150408	0.8																					
	SPGN150412	1.2																					
	SPGN190408	0.8																					
	SPGN190416	1.6																					
	SPUN090304	0.4																					
	SPUN090308	0.8																					
	SPUN120304	0.4																					
	SPUN120308	0.8																					
	SPUN120312	1.2																					
	SPUN150408	0.8																					
	SPUN150412	1.2																					
	SPUN190408	0.8																					
	SPUN190412	1.2																					
SPUN190416	1.6																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



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TP**	L	I.C	S
11 03	11	6.35	3.18
16 03	16.5	9.525	3.18
22 04	22	12.7	4.76

- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

Milling inserts

TP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW											
				P	M	K	N	S	H																				
ISO				bs	be	an	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201		
	TPAN1103PP22PN			0.7	0.7	11	○												○										
	TPAN1603PPS42PN			1.2	1.2	11																							
	TPAN2204PDER			1.4	1.4	15																							
	TPAN2204PDFR			1.4	1.4	11																						○	
	TPCN1103PPS22PN			0.7	0.7	11																							
	TPCN2204PDFR			1.4	1.4	15																						○	
	TPCN2204PDRSKR			1.4	1.4	15	●																						
	TPCN2204PPEN			1.4	1.4	11	○																						

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

TPKN	L	I.C	S
16 03	16.5	9.525	3.18

Milling inserts

TP** milling insert				HC ¹ (CVD)						HC ¹ (PVD)						HT	HC ²	HW										
				P	M	K	N	S	H																			
ISO				bs	be	an	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	TPKN1603PDRSKR	1.0	1.2	11	●																							
	TPKN1603PDSKL	1.0	1.2	11																								
	TPKN1603PDTKR	1.0	1.2	11											○												○	
	TPKN1603PPER	1.0	1.2	11	●																							
	TPKN1603PPFR	1.0	1.2	11															○									○

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

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TP**	L	I.C	S
09 02	9.63	5.56	2.38
11 02	11	6.35	2.38
11 03	11	6.35	3.18
16 03	16.5	9.525	3.18
16 04	16.5	9.525	4.76
22 04	22	12.7	4.76
33 09	33	19.05	9.52

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Milling inserts

TP** milling insert		HC ¹ (CVD)						HC ¹ (PVD)					HT	HC ²	HW									
		P	M	K	N	S	H																	
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YD101	YD201	
	TPMR090204	0.4				●																		
	TPMR110304	0.4				●														●				
	TPMR110308	0.8				●														○				
	TPMR160304	0.4				●	○													○				
	TPMR160308	0.8				●	●	○												○				
	TPMR160312	1.2				○	○																	
	TPMR220412	1.2				●																		
	TPMR330916	1.6																						
	TPUN110208	0.8																						
	TPUN110304	0.4				●																		
	TPUN110308	0.8				●																		
	TPUN160304	0.4				●																	○	
	TPUN160308	0.8				●	○																○	
	TPUN160312	1.2				●																	●	
	TPUN160408	0.8																						
	TPUN160412	1.2																						
	TPUN220404	0.4																						
	TPUN220408	0.8				●																		
TPUN220412	1.2					○																	○	
TPUN220416	1.6																						○	

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide

System code > A194

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Guide for recommended cutting data – indexable milling

Indexable milling - group 1 (FMA07/11/12, FMD02, EMP09/13)

Material group	Composition / structure / heat treatment	Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
				HC (VDI)								
				YBC302		YBC401		YBD152		YBD252		
				a_p / D		a_p / D		a_p / D		a_p / D		
				1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5			
P Unalloyed steel	ca. 0,15 % C	annealed	125	1	260	300	225	280				
	ca. 0,45 % C	annealed	190	2	225	255	195	225				
	ca. 0,45 % C	tempered	250	3	210	240	180	210				
	ca. 0,75 % C	annealed	270	4	185	210	160	185				
	ca. 0,75 % C	tempered	300	5	170	195	150	170				
P Low-alloyed steel		annealed	180	6	225	255	195	225				
		tempered	275	7	185	210	160	185				
		tempered	300	8	170	195	150	170				
		tempered	350	9	145	165	125	145				
P High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	115	130				
		hardened and tempered	325	11	95	105	80	95				
M Stainless steel	ferritic/martensitic	annealed	200	12								
	martensitic	tempered	240	13								
	austenitic	quench hardened	180	14								
	austenitic-ferritic		230	15								
K Grey cast iron	perlitic/ferritic		180	16				370	430	320	370	
	perlitic (martensitic)		260	17				220	255	150	220	
	ferritic		160	18				255	295	220	255	
	perlitic		250	19				170	200	145	170	
K Cast iron with spheroidal graphite	ferritic		130	20				305	355	265	305	
	perlitic		230	21				205	240	175	205	
N Malleable cast iron												
N Aluminium wrought alloys	cannot be hardened		60	22								
	hardenable	hardened	100	23								
	$\leq 12\%$ Si, cannot be hardened		75	24								
	$\leq 12\%$ Si, hardenable	hardened	90	25								
N Cast aluminium alloys	$> 12\%$ Si, cannot be hardened		130	26								
N Copper and copper alloys (bronze/brass)	machining steel, Pb $> 1\%$		110	27								
	CuZn, CuSnZn		90	28								
	CuSn, Pb-free copper, electrolytic copper		100	29								
S Heat-resistant alloys	Fe-based alloys	annealed	200	30								
		hardened	280	31								
	Ni or Co base	annealed	250	32								
		hardened	350	33								
		cast	320	34								
S Titanium alloys	pure titanium		$R_m 400$	35								
	α and β alloys	hardened	$R_m 1050$	36								
H Hardened steel		hardened and tempered	55 HRC	37								
		hardened and tempered	60 HRC	38								
		cast	400	39								
H Hardened cast iron		hardened and tempered	55 HRC	40								
X Non-metallic materials	Thermoplasts			41								
	Thermosetting plastics			42								
	Plastic, glass-fibre reinforced GFRP			43								
	Plastic, carbon fibre reinforced CFRP			44								
	Graphite			45								
	Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions. The values have to be adapted in individual cases. Feed rate recommendations on page B240. For examples of material for cutting tool groups view page D22.

Recommend feed rate

Indexable milling – group 1 (FMA07/11/12, FMD02, EMP09/13)

5	Material group	Feed rate per cutting edge [mm]																	
		EMP09			EMP13			FMA07			FMA07			FMA11					
		LNKT12			ANGX15			ONHU06			ONHU08			SNEG12					
		Application																	
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R				
P	Unalloyed steel	0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23		0,20	0,23	
	Low-alloyed steel	0,23	0,47		0,22			0,23			0,17	0,22		0,17	0,22		0,19	0,21	
	High-alloyed steel and high-alloyed tool steel	0,22	0,44		0,20			0,22			0,16	0,20		0,16	0,20		0,18	0,20	
M	Stainless steel		0,18	0,35													0,14	0,16	
K	Grey cast iron	0,28	0,55		0,26			0,28			0,20	0,26		0,20	0,26		0,22	0,25	
	Cast iron with spheroidal graphite	0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23		0,20	0,23	
	Malleable cast iron	0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23		0,20	0,23	
N	Aluminium wrought alloys				0,20			0,21											
	Aluminium-Gusslegierungen				0,20			0,21											
	Copper and copper alloys (bronze/brass)				0,18			0,19											
S	Heat-resistant alloys																		
	Titanium alloys																		
H	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
X	Non-metallic materials																		

1. Select the appropriate product family/cutting data group.
2. Select the used grade.
3. Determine the immersion.
4. Select the used material and read the cutting speed.
5. Please have a look at the detached feed rate recommendations.
6. Select the used tool, the machining mode and the used material.

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Indexable milling – group 1 (FMA07/11/12, FMD02, EMP09/13)

Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
					HC (CVD)								
					YBC302		YBC401		YBD152		YBD252		
					a_e / D		a_e / D		a_e / D		a_e / D		
				1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5		
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	260	300	225	260				
		ca. 0,45 % C	annealed	190	2	225	255	195	225				
		ca. 0,45 % C	tempered	250	3	210	240	180	210				
		ca. 0,75 % C	annealed	270	4	185	210	160	185				
		ca. 0,75 % C	tempered	300	5	170	195	150	170				
	Low-alloyed steel		annealed	180	6	225	255	195	225				
			tempered	275	7	185	210	160	185				
			tempered	300	8	170	195	150	170				
			tempered	350	9	145	165	125	145				
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	115	130				
		hardened and tempered	325	11	95	105	80	95					
M	Stainless steel	ferritic/martensitic	annealed	200	12								
		martensitic	tempered	240	13								
		austenitic	quench hardened	180	14								
		austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16				370	430	320	370	
		perlitic (martensitic)		260	17				220	255	190	220	
	Cast iron with spheroidal graphite	ferritic		160	18				255	295	220	255	
		perlitic		250	19				170	200	145	170	
	Malleable cast iron	ferritic		130	20				305	355	265	305	
		perlitic		230	21				205	240	175	205	
N	Aluminium wrought alloys	cannot be hardened		60	22								
		hardenable	hardened	100	23								
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24								
		$\leq 12\%$ Si, hardenable	hardened	90	25								
		$> 12\%$ Si, cannot be hardened		130	26								
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%		110	27								
		CuZn, CuSnZn		90	28								
	CuSn, Pb-free copper, electrolytic copper		100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
			hardened	280	31								
		Ni or Co base	annealed	250	32								
			hardened	350	33								
		cast	320	34									
Titanium alloys	pure titanium		R_m 400	35									
	α and β alloys		hardened	R_m 1050	36								
H	Hardened steel	hardened and tempered		55 HRC	37								
		hardened and tempered		60 HRC	38								
	Hard cast iron	cast		400	39								
	Hardened cast iron	hardened and tempered		55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Starting values for cutting speed v_c [m/min]															
HC (CVD)		HC (PVD)										HW			
YBM253		YBG102		YB9320		YBG205		YBG252		YBG302		YD101		YD201	
a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D	
1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5
260	300	270	315	245	285	235	275	230	265	225	260				
225	255	230	270	210	245	200	235	200	230	195	225				
210	240	220	255	200	230	190	220	185	215	180	210				
185	210	190	225	175	200	165	195	165	190	160	185				
170	195	180	205	160	190	155	180	150	175	150	170				
225	255	230	270	210	245	200	235	200	230	195	225				
185	210	190	225	175	200	165	195	165	190	160	185				
170	195	180	205	160	190	155	180	150	175	150	170				
145	165	150	175	135	160	130	155	130	150	125	145				
130	150	135	160	125	145	120	140	115	135	115	130				
95	105	95	115	90	100	85	100	85	95	80	95				
130	150	135	160	125	145	120	140	115	135	115	130				
110	130	115	135	105	120	100	120	100	115	95	110				
140	160	145	170	130	155	125	150	125	145	120	140				
110	130	115	135	105	120	100	120	100	115	95	110				
		300	345	270	315	260	300	255	295	250	290				
		180	205	160	190	155	180	150	175	150	170				
		205	240	185	215	180	210	175	200	170	195				
		135	160	125	145	120	140	115	135	115	130				
		245	285	225	260	215	250	210	240	205	235				
		165	190	150	175	145	165	140	160	135	160				
												1505	1735	1450	1670
												1225	1420	1180	1370
												540	620	515	600
												435	505	420	485
												220	255	215	250
												170	195	160	190
												210	245	205	235
												385	445	370	430

HC Coated carbide
 HT Uncoated carbide, main component (TiC) o. (TiN), cermet
 HC₁ Coated cermet
 HW Uncoated carbide, main component (WC)

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Indexable milling – group 2 (FMA01/02/03/04, FME01/02, EMP01/02/03/04)

Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
					HC (CVD)								
					YBC302		YBC401		YBD152		YBD252		
					a_e / D		a_e / D		a_e / D		a_e / D		
				1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5		
P Unalloyed steel	ca. 0,15 % C	annealed	125	1	245	285	210	245					
	ca. 0,45 % C	annealed	190	2	210	245	180	210					
	ca. 0,45 % C	tempered	250	3	200	230	170	200					
	ca. 0,75 % C	annealed	270	4	175	200	150	175					
	ca. 0,75 % C	tempered	300	5	160	190	140	160					
P Low-alloyed steel		annealed	180	6	210	245	180	210					
		tempered	275	7	175	200	150	175					
		tempered	300	8	160	190	140	160					
		tempered	350	9	135	160	120	135					
P High-alloyed steel and high-alloyed tool steel		annealed	200	10	125	145	105	125					
		hardened and tempered	325	11	90	100	75	90					
M Stainless steel	ferritic/martensitic	annealed	200	12									
	martensitic	tempered	240	13									
	austenitic	quench hardened	180	14									
	austenitic-ferritic		230	15									
K Grey cast iron	perlitic/ferritic		180	16				315	365	270	315		
	perlitic (martensitic)		260	17				185	215	160	190		
K Cast iron with spheroidal graphite	ferritic		160	18				215	250	185	215		
	perlitic		250	19				145	170	125	145		
K Malleable cast iron	ferritic		130	20				260	300	225	260		
	perlitic		230	21				175	205	150	175		
N Aluminium wrought alloys	cannot be hardened		60	22									
	hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\% \text{ Si}$, cannot be hardened		75	24								
		$\leq 12\% \text{ Si}$, hardenable	hardened	90	25								
N Copper and copper alloys (bronze/brass)	$> 12\% \text{ Si}$, cannot be hardened		130	26									
	machining steel, PB > 1%		110	27									
	CuZn, CuSnZn		90	28									
S Heat-resistant alloys	Fe-based alloys	annealed	200	30									
		hardened	280	31									
	Ni or Co base	annealed	250	32									
		hardened	350	33									
S Titanium alloys	cast		320	34									
	pure titanium		R_m 400	35									
H Hardened steel	α and β alloys	hardened	R_m 1050	36									
		hardened and tempered		37									
H Hard cast iron		hardened and tempered		38									
		cast	400	39									
H Hardened cast iron		hardened and tempered	55 HRC	40									
X Non-metallic materials	Thermoplasts			41									
	Thermosetting plastics			42									
	Plastic, glass-fibre reinforced GFRP			43									
	Plastic, carbon fibre reinforced CFRP			44									
	Graphite			45									
	Wood			46									

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Starting values for cutting speed v_c [m/min]																					
HC (CVD)				HC (PVD)												HW				HT	
YBM253		YBG101		YBG102		YBG152		YB9320		YBG205		YBG252		YBG302		YD101		YD201		YNG151	
a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D	
1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5
245	285			255	295	240	280	230	265	220	255	215	250	210	245					270	315
210	245			220	255	205	240	200	230	190	220	185	215	180	210					235	270
200	230			205	240	195	225	185	215	180	205	175	200	170	200					220	255
175	200			180	210	170	200	165	190	155	180	155	175	150	175					195	220
160	190			170	195	160	185	150	175	145	170	140	165	140	160					180	210
210	245			220	255	205	240	200	230	190	220	185	215	180	210					235	270
175	200			180	210	170	200	165	190	155	180	155	175	150	175					195	220
160	190			170	195	160	185	150	175	145	170	140	165	140	160					180	210
135	160			145	165	135	155	130	150	125	145	120	140	120	135					150	180
125	145			130	150	120	140	115	135	110	130	110	125	105	125					140	160
90	100			90	105	85	100	85	95	80	90	80	90	75	90					100	110
125	145			130	150	120	140	115	135	110	130	110	125	105	125					135	160
105	120			110	125	105	120	100	115	95	110	95	105	90	105					115	135
130	155			140	160	130	150	125	145	120	140	115	135	115	130					145	170
105	120			110	125	105	120	100	115	95	110	95	105	90	105					115	135
				285	330	265	305	255	295	245	285	240	280	235	275						
				170	195	160	185	150	175	145	170	140	165	140	160						
				195	225	180	210	175	200	165	195	165	190	160	185						
				130	150	120	140	115	135	110	130	110	125	105	125						
				230	270	220	255	210	240	200	230	195	225	190	225						
				155	180	145	170	140	160	135	155	130	150	130	150						
		1505	1735													1205	1390	1040	1200		
		1225	1420													980	1140	850	980		
		540	620													435	500	375	435		
		435	505													350	405	300	350		
		220	255													180	205	155	180		
		170	195													140	160	120	140		
		210	245													170	200	150	170		
		385	445													310	360	265	310		
				75	85	70	80	65	75	65	75	65	75	60	70						
				50	55	50	55	45	50	45	50	45	50	40	45						
				60	70	55	65	55	65	50	55	50	55	50	55						
				35	40	35	40	30	35	30	35	30	35	30	35						
				45	50	45	50	40	45	40	45	40	45	40	45						
				75	85	70	80	65	75	65	75	65	75	60	70						
				75	85	70	80	65	75	65	75	65	75	60	70						

HC Coated carbide
 HT Uncoated carbide, main component (TiC) o. (TiN), cermet
 HC₁ Coated cermet
 HW Uncoated carbide, main component (WC)

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Indexable milling – group 2 (FMA01/02/03/04, FME01/02, EMP01/02/03/04)

Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]			
					HC1		YNG151C	
					a_e / D			
				1/1	3/4	1/5		
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	285	335	
		ca. 0,45 % C	annealed	190	2	250	285	
		ca. 0,45 % C	tempered	250	3	235	270	
		ca. 0,75 % C	annealed	270	4	205	235	
		ca. 0,75 % C	tempered	300	5	190	225	
	Low-alloyed steel		annealed	180	6	250	285	
			tempered	275	7	205	235	
			tempered	300	8	190	225	
			tempered	350	9	160	190	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	150	170	
		hardened and tempered	325	11	105	120		
M	Stainless steel	ferritic/martensitic	annealed	200	12	145	170	
		martensitic	tempered	240	13	120	145	
		austenitic	quench hardened	180	14	155	180	
		austenitic-ferritic		230	15	120	145	
K	Grey cast iron	perlitic/ferritic		180	16			
		perlitic (martensitic)		260	17			
	Cast iron with spheroidal graphite	ferritic		160	18			
		perlitic		250	19			
	Malleable cast iron	ferritic		130	20			
		perlitic		230	21			
N	Aluminium wrought alloys	cannot be hardened		60	22			
		hardenable	hardened	100	23			
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24			
		$\leq 12\%$ Si, hardenable	hardened	90	25			
		$> 12\%$ Si, cannot be hardened		130	26			
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27			
		CuZn, CuSnZn		90	28			
	CuSn, Pb-free copper, electrolytic copper		100	29				
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30			
			hardened	280	31			
		Ni or Co bass	annealed	250	32			
			hardened	350	33			
		cast	320	34				
Titanium alloys	pure titanium		R_m 400	35				
	α and β alloys	hardened	R_m 1050	36				
H	Hardened steel		hardened and tempered	55 HRC	37			
			hardened and tempered	60 HRC	38			
	Hard cast iron		cast	400	39			
	Hardened cast iron		hardened and tempered	55 HRC	40			
X	Non-metallic materials	Thermoplasts			41			
		Thermosetting plastics			42			
		Plastic, glass-fibre reinforced GFRP			43			
		Plastic, carbon fibre reinforced CFRP			44			
		Graphite			45			
		Wood			46			

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Indexable milling – group 3 (FMR01/02/03/04)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]							
						HC (CVD)							
						YBC302			YBC401				
						a_e / D			a_e / D				
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20								
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	260	300	390	225	260	340		
		ca. 0,45 % C	annealed	190	2	225	255	335	195	225	295		
		ca. 0,45 % C	tempered	250	3	210	240	315	180	210	275		
		ca. 0,75 % C	annealed	270	4	185	210	275	160	185	245		
		ca. 0,75 % C	tempered	300	5	170	195	255	150	170	225		
	Low-alloyed steel		annealed	180	6	225	255	335	195	225	295		
			tempered	275	7	185	210	275	160	185	245		
			tempered	300	8	170	195	255	150	170	225		
			tempered	350	9	145	165	215	125	145	190		
		High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	195	115	130	170	
	hardened and tempered		325	11	95	105	140	80	95	125			
M	Stainless steel	ferritic/martensitic	annealed	200	12								
		martensitic	tempered	240	13								
		austenitic	quench hardened	180	14								
		austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16								
		perlitic (martensitic)		260	17								
	Cast iron with spheroidal graphite	ferritic		160	18								
		perlitic		250	19								
	Malleable cast iron	ferritic		130	20								
		perlitic		230	21								
N	Aluminium wrought alloys	cannot be hardened		60	22								
		hardenable	hardened	100	23								
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24								
		$\leq 12\%$ Si, hardenable	hardened	90	25								
		$> 12\%$ Si, cannot be hardened		130	26								
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%			110	27							
		CuZn, CuSnZn			90	28							
CuSn, Pb-free copper, electrolytic copper			100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
			hardened	280	31								
		Ni or Co base	annealed	250	32								
			hardened	350	33								
	cast	320	34										
Titanium alloys	pure titanium		R_m 400	35									
α and β alloys	hardened		R_m 1050	36									
H	Hardened steel		hardened and tempered	55 HRC	37								
			hardened and tempered	60 HRC	38								
	Hard cast iron		cast	400	39								
	Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Starting values for cutting speed v_c [m/min]																						
HC (CVD)									HC (PVD)													
YBD152			YBD252			YBM253			YBG102			YBG152			YB9320			YBG205				
a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D				
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20		
								260	300	390	270	315	410	255	295	385	245	285	375	235	275	360
								225	255	335	230	270	355	220	255	335	210	245	320	200	235	310
								210	240	315	220	255	335	205	240	315	200	230	300	190	220	290
								185	210	275	190	225	295	180	210	275	175	200	260	165	195	255
								170	195	255	180	205	270	170	195	255	160	190	250	155	180	235
								225	255	335	230	270	355	220	255	335	210	245	320	200	235	310
								185	210	275	190	225	295	180	210	275	175	200	260	165	195	255
								170	195	255	180	205	270	170	195	255	160	190	250	155	180	235
								145	165	215	150	175	230	145	165	215	135	160	210	130	155	205
								130	150	195	135	160	210	130	150	195	125	145	190	120	140	185
								95	105	140	95	115	150	90	105	140	90	100	130	85	100	130
								130	150	195	135	160	205	130	150	195	125	145	190	120	140	180
								110	130	165	115	135	175	110	125	165	105	120	160	100	120	155
								140	160	210	145	170	220	140	160	205	130	155	200	125	150	195
								110	130	165	115	135	175	110	125	165	105	120	160	100	120	155
	345	400	520	300	345	450					300	345	450	285	330	430	270	315	410	260	300	390
	210	245	320	180	205	270					180	205	270	170	195	255	160	190	250	155	180	235
	240	280	365	205	240	315					205	240	315	195	225	295	185	215	280	180	210	275
	160	185	245	135	160	210					135	160	210	130	150	195	125	145	190	120	140	185
	285	330	430	245	285	375					245	285	375	230	270	355	225	260	340	215	250	325
	190	220	290	165	190	250					165	190	250	155	180	235	150	175	230	145	165	215

HC Coated carbide
 HT Uncoated carbide, main component (TiC) o. (TiN), cermet
 HC₁ Coated cermet
 HW Uncoated carbide, main component (WC)

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Indexable milling – group 3 (FMR01/02/03/04)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]						
						HC (PVD)						
						YBG212			YBG252			
						a_e / D			a_e / D			
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20							
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	240	280	365	230	265	345	
		ca. 0,45 % C	annealed	190	2	205	240	315	200	230	300	
		ca. 0,45 % C	tempered	250	3	195	225	295	185	215	280	
		ca. 0,75 % C	annealed	270	4	170	200	260	165	190	250	
		ca. 0,75 % C	tempered	300	5	160	185	245	150	175	230	
	Low-alloyed steel		annealed	180	6	205	240	315	200	230	300	
			tempered	275	7	170	200	260	165	190	250	
			tempered	300	8	160	185	245	150	175	230	
			tempered	350	9	135	155	205	130	150	195	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	120	140	185	115	135	180	
		hardened and tempered	325	11	85	100	130	85	95	125		
M	Stainless steel	ferritic/martensitic	annealed	200	12	120	140	185	115	135	175	
		martensitic	tempered	240	13	105	120	155	100	115	145	
		austenitic	quench hardened	180	14	130	150	195	125	145	185	
		austenitic-ferritic		230	15	105	120	155	100	115	145	
K	Grey cast iron	perlitic/ferritic		180	16	265	305	400	255	295	385	
		perlitic (martensitic)		260	17	160	185	245	150	175	230	
	Cast iron with spheroidal graphite	ferritic		160	18	180	210	275	175	200	260	
		perlitic		250	19	120	140	185	115	135	180	
	Malleable cast iron	ferritic		130	20	220	255	335	210	240	315	
		perlitic		230	21	145	170	225	140	160	210	
N	Aluminium wrought alloys	cannot be hardened		60	22							
		hardenable	hardened	100	23							
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24							
		$\leq 12\%$ Si, hardenable	hardened	90	25							
		$> 12\%$ Si, cannot be hardened		130	26							
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%		110	27							
		CuZn, CuSnZn		90	28							
CuSn, Pb-free copper, electrolytic copper		100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30							
			hardened	280	31							
		Ni or Co base	annealed	250	32							
			hardened	350	33							
	cast	320	34									
Titanium alloys	pure titanium		R_m 400	35								
α and β alloys	hardened		R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37							
	Hard cast iron		cast	400	39							
	Hardened cast iron		hardened and tempered	55 HRC	40							
X	Non-metallic materials	Thermoplasts			41							
		Thermosetting plastics			42							
		Plastic, glass-fibre reinforced GFRP			43							
		Plastic, carbon fibre reinforced CFRP			44							
		Graphite			45							
		Wood			46							

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Indexable milling – group 4 (BMR01/02/03/04, TMP01, CMZ01, CMA01, CMD01)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]							
						HC (CVD)							
						YBC302			YBC401				
						a_e / D			a_e / D				
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20								
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	235	275	360	200	230	300		
		ca. 0,45 % C	annealed	190	2	200	235	310	170	200	260		
		ca. 0,45 % C	tempered	250	3	190	220	290	160	185	245		
		ca. 0,75 % C	annealed	270	4	165	195	255	140	165	215		
		ca. 0,75 % C	tempered	300	5	155	180	235	130	150	195		
	Low-alloyed steel		annealed	180	6	200	235	310	170	200	260		
			tempered	275	7	165	195	255	140	165	215		
			tempered	300	8	155	180	235	130	150	195		
			tempered	350	9	130	155	205	110	130	170		
		High-alloyed steel and high-alloyed tool steel		annealed	200	10	120	140	185	100	115	150	
	hardened and tempered		325	11	85	100	130	70	85	115			
M	Stainless steel	ferritic/martensitic	annealed	200	12								
		martensitic	tempered	240	13								
		austenitic	quench hardened	180	14								
		austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16								
		perlitic (martensitic)		260	17								
	Cast iron with spheroidal graphite	ferritic		160	18								
		perlitic		250	19								
	Malleable cast iron	ferritic		130	20								
		perlitic		230	21								
N	Aluminium wrought alloys	cannot be hardened		60	22								
		hardenable	hardened	100	23								
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24								
		$\leq 12\%$ Si, hardenable	hardened	90	25								
		$> 12\%$ Si, cannot be hardened		130	26								
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%			110	27							
		CuZn, CuSnZn			90	28							
CuSn, Pb-free copper, electrolytic copper			100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
			hardened	280	31								
		Ni or Co base	annealed	250	32								
			hardened	350	33								
	cast	320	34										
Titanium alloys	pure titanium		R_m 400	35									
α and β alloys	hardened		R_m 1050	36									
H	Hardened steel		hardened and tempered	55 HRC	37								
			hardened and tempered	60 HRC	38								
	Hard cast iron		cast	400	39								
	Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Starting values for cutting speed v_c [m/min]																							
HC (CVD)									HC (PVD)														
YBD152			YBD252			YBM253			YBG102			YBG152			YB9320			YBG205					
a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D					
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20			
									235	275	360	245	285	375	230	265	345	220	255	335	210	245	320
									200	235	310	210	245	320	200	230	300	190	220	290	180	210	275
									190	220	290	200	230	300	185	215	280	180	205	270	170	200	260
									165	195	255	175	200	260	165	190	250	155	180	235	150	175	230
									155	180	235	160	190	250	150	175	230	145	170	225	140	160	210
									200	235	310	210	245	320	200	230	300	190	220	290	180	210	275
									165	195	255	175	200	260	165	190	250	155	180	235	150	175	230
									155	180	235	160	190	250	150	175	230	145	170	225	140	160	210
									130	155	205	135	160	210	130	150	195	125	145	190	120	135	180
									120	140	185	125	145	190	115	135	180	110	130	170	105	125	165
									85	100	130	90	100	130	85	95	125	80	90	120	75	90	120
									120	140	180	125	145	190	115	135	175	110	130	170	105	125	160
									100	120	155	105	120	160	100	115	145	95	110	145	90	105	135
									125	150	195	130	155	200	125	145	185	120	140	180	115	130	170
									100	120	155	105	120	160	100	115	145	95	110	145	90	105	135
	300	345	450	260	300	390						270	315	410	255	295	385	245	285	375	235	275	360
	180	210	275	155	180	235						160	190	250	150	175	230	145	170	225	140	160	210
	210	245	320	180	210	275						185	215	280	175	200	260	165	195	255	160	185	245
	140	165	215	120	140	185						125	145	190	115	135	180	110	130	170	105	125	165
	250	290	380	215	250	325						225	260	340	210	240	315	200	230	300	190	225	295
	170	200	260	145	165	215						150	175	230	140	160	210	135	155	205	130	150	195

HC Coated carbide
 HT Uncoated carbide, main component (TiC) o. (TiN), cermet
 HC₁ Coated cermet
 HW Uncoated carbide, main component (WC)

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Indexable milling – group 4 (BMR01/02/03/04, TMP01,CMZ01,CMA01,CMD01)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]						
						HC (PVD)						
						YBG212			YBG252			
						a_e / D			a_e / D			
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20							
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	215	250	325	205	240	315	
		ca. 0,45 % C	annealed	190	2	185	215	280	175	205	270	
		ca. 0,45 % C	tempered	250	3	175	200	260	165	195	255	
		ca. 0,75 % C	annealed	270	4	155	175	230	145	170	225	
		ca. 0,75 % C	tempered	300	5	140	165	215	135	160	210	
	Low-alloyed steel		annealed	180	6	185	215	280	175	205	270	
			tempered	275	7	155	175	230	145	170	225	
			tempered	300	8	140	165	215	135	160	210	
			tempered	350	9	120	140	185	115	135	180	
		High-alloyed steel and high-alloyed tool steel		annealed	200	10	110	125	165	105	120	160
	hardened and tempered		325	11	80	90	120	75	85	115		
M	Stainless steel	ferritic/martensitic	annealed	200	12	110	125	165	105	120	160	
		martensitic	tempered	240	13	95	105	140	90	105	135	
		austenitic	quench hardened	180	14	115	135	175	110	130	170	
		austenitic-ferritic		230	15	95	105	140	90	105	135	
K	Grey cast iron	perlitic/ferritic		180	16	240	280	365	230	265	345	
		perlitic (martensitic)		260	17	140	165	215	135	160	210	
	Cast iron with spheroidal graphite	ferritic		160	18	165	190	250	155	180	235	
		perlitic		250	19	110	125	165	105	120	160	
	Malleable cast iron	ferritic		130	20	195	225	295	185	220	290	
		perlitic		230	21	130	150	195	125	145	190	
N	Aluminium wrought alloys	cannot be hardened		60	22							
		hardenable	hardened	100	23							
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24							
		$\leq 12\%$ Si, hardenable	hardened	90	25							
		$> 12\%$ Si, cannot be hardened		130	26							
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%			110	27						
		CuZn, CuSnZn			90	28						
CuSn, Pb-free copper, electrolytic copper			100	29								
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30							
			hardened	280	31							
		Ni or Co bass	annealed	250	32							
			hardened	350	33							
	cast	320	34									
Titanium alloys	pure titanium		R_m 400	35								
α and β alloys	hardened		R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37							
			hardened and tempered	60 HRC	38							
	Hard cast iron		cast	400	39							
Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41							
		Thermosetting plastics			42							
		Plastic, glass-fibre reinforced GFRP			43							
		Plastic, carbon fibre reinforced CFRP			44							
		Graphite			45							
		Wood			46							

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Indexable milling – group 5 (SMP01/03/05)

Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]				
					HC (CVD)		HC (PVD)		
					YBC302	YBM253	YBG101	YB9320	
				a_e / D	a_e / D	a_e / D	a_e / D		
				1/4	1/4	1/4	1/4		
P Unalloyed steel	ca. 0,15 % C	annealed	125	1	165	180	190	175	
	ca. 0,45 % C	annealed	190	2	145	155	165	150	
	ca. 0,45 % C	tempered	250	3	135	145	155	140	
	ca. 0,75 % C	annealed	270	4	120	130	135	125	
	ca. 0,75 % C	tempered	300	5	110	120	125	115	
P Low-alloyed steel		annealed	180	6	145	155	165	150	
		tempered	275	7	120	130	135	125	
		tempered	300	8	110	120	125	115	
		tempered	350	9	95	100	105	100	
P High-alloyed steel and high-alloyed tool steel		annealed	200	10	85	90	95	90	
		hardened and tempered	325	11	60	65	70	65	
M Stainless steel	ferritic/martensitic	annealed	200	12		90	95	90	
	martensitic	tempered	240	13		80	80	75	
	austenitic	quench hardened	180	14		100	105	95	
	austenitic-ferritic		230	15		80	80	75	
K Grey cast iron	perlitic/ferritic		180	16			215	190	
	perlitic (martensitic)		260	17			125	115	
	ferritic		160	18			145	135	
	perlitic		250	19			95	90	
K Cast iron with spheroidal graphite	ferritic		130	20			175	160	
	perlitic		230	21			115	105	
K Malleable cast iron									
N Aluminium wrought alloys	cannot be hardened		60	22					
	hardenable	hardened	100	23					
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24				
		$\leq 12\%$ Si, hardenable	hardened	90	25				
		$> 12\%$ Si, cannot be hardened		130	26				
N Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27					
	CuZn, CuSnZn		90	28					
	CuSn, Pb-free copper, electrolytic copper		100	29					
S Heat-resistant alloys	Fe-based alloys	annealed	200	30					
		hardened	280	31					
	Ni or Co bass	annealed	250	32					
		hardened	350	33					
		cast	320	34					
S Titanium alloys	pure titanium		R_m 400	35					
	α and β alloys	hardened	R_m 1050	36					
H Hardened steel		hardened and tempered	55 HRC	37					
		hardened and tempered	60 HRC	38					
		cast	400	39					
H Hard cast iron		hardened and tempered	55 HRC	40					
X Non-metallic materials	Thermoplasts			41					
	Thermosetting plastics			42					
	Plastic, glass-fibre reinforced GFRP			43					
	Plastic, carbon fibre reinforced CFRP			44					
	Graphite			45					
	Wood			46					

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Indexable milling – group 6 (FMD03, FME04, FMP03, HMP01)

Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
					HC (CVD)								
					YBC302		YBC401		YBD152		YBD252		
					a_e / D		a_e / D		a_e / D		a_e / D		
		1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5				
P Unalloyed steel	ca. 0,15 % C	annealed	125	1	200	230	170	200					
	ca. 0,45 % C	annealed	190	2	170	200	145	170					
	ca. 0,45 % C	tempered	250	3	160	185	140	160					
	ca. 0,75 % C	annealed	270	4	140	165	120	140					
	ca. 0,75 % C	tempered	300	5	130	150	115	130					
P Low-alloyed steel		annealed	180	6	170	200	145	170					
		tempered	275	7	140	165	120	140					
		tempered	300	8	130	150	115	130					
		tempered	350	9	110	130	95	110					
P High-alloyed steel and high-alloyed tool steel		annealed	200	10	100	115	85	100					
		hardened and tempered	325	11	70	85	60	70					
M Stainless steel	ferritic/martensitic	annealed	200	12									
	martensitic	tempered	240	13									
	austenitic	quench hardened	180	14									
	austenitic-ferritic		230	15									
K Grey cast iron	perlitic/ferritic		180	16				255	295	220	255		
	perlitic (martensitic)		260	17				150	175	130	150		
K Cast iron with spheroidal graphite	ferritic		160	18				175	205	150	175		
	perlitic		250	19				115	135	100	115		
K Malleable cast iron	ferritic		130	20				210	245	180	210		
	perlitic		230	21				140	165	120	140		
N Aluminium wrought alloys	cannot be hardened		60	22									
	hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24								
		$\leq 12\%$ Si, hardenable	hardened	90	25								
N Copper and copper alloys (bronze/brass)	$> 12\%$ Si, cannot be hardened		130	26									
	machining steel, PB > 1%		110	27									
	CuZn, CuSnZn		90	28									
S Heat-resistant alloys	Fe-based alloys	annealed	200	30									
		hardened	280	31									
	Ni or Co base	annealed	250	32									
		hardened	350	33									
S Titanium alloys	cast		320	34									
	pure titanium		R_m 400	35									
H Hardened steel	α and β alloys	hardened	R_m 1050	36									
		hardened and tempered	55 HRC	37									
H Hard cast iron		hardened and tempered	60 HRC	38									
		cast	400	39									
H Hardened cast iron		hardened and tempered	55 HRC	40									
X Non-metallic materials	Thermoplasts			41									
	Thermosetting plastics			42									
	Plastic, glass-fibre reinforced GFRP			43									
	Plastic, carbon fibre reinforced CFRP			44									
	Graphite			45									
	Wood			46									

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Starting values for cutting speed v_c [m/min]																
HC (CVD)		HC (PVD)														
YBM253		YBG102		YBG152		YB9320		YBG205		YBG212		YBG252		YBG302		
a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		
1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5	
200	230	205	240	195	225	190	220	185	215	185	215	180	210	175	205	
170	200	175	205	170	195	165	190	160	185	160	185	155	180	150	175	
160	185	165	195	160	180	155	180	150	175	150	175	145	170	140	165	
140	165	145	170	140	160	135	155	130	155	130	155	130	150	125	145	
130	150	135	160	130	150	125	145	125	140	125	140	120	140	115	135	
170	200	175	205	170	195	165	190	160	185	160	185	155	180	150	175	
140	165	145	170	140	160	135	155	130	155	130	155	130	150	125	145	
130	150	135	160	130	150	125	145	125	140	125	140	120	140	115	135	
110	130	115	135	110	125	105	125	105	120	105	120	100	120	100	115	
100	115	105	120	100	115	95	110	95	110	95	110	90	105	90	105	
70	85	75	85	70	80	70	80	65	80	65	80	65	75	65	75	
100	115	105	120	100	115	95	110	95	110	95	110	90	105	90	105	
85	100	90	105	85	95	80	95	80	95	80	95	80	90	75	90	
110	125	110	130	105	120	105	120	100	115	100	115	100	115	95	110	
85	100	90	105	85	95	80	95	80	95	80	95	80	90	75	90	
		230	265	215	250	210	245	205	240	205	240	200	230	195	225	
		135	160	130	150	125	145	125	140	125	140	120	140	115	135	
		155	180	150	170	145	165	140	165	140	165	135	160	135	155	
		105	120	100	115	95	110	95	110	95	110	90	105	90	105	
		185	220	180	205	175	200	170	195	170	195	165	190	160	185	
		125	145	120	135	115	135	115	130	115	130	110	130	105	125	

HC Coated carbide
 HT Uncoated carbide, main component (TiC) o. (TiN), cermet
 HC₁ Coated cermet
 HW Uncoated carbide, main component (WC)

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Indexable milling – group 7 (XMR01, XMP01)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]					
						HC (CVD)					
						YBC302			YBD152		
						a_e / D			a_e / D		
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20						
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	260	300	390			
		ca. 0,45 % C	annealed	190	2	225	255	335			
		ca. 0,45 % C	tempered	250	3	210	240	315			
		ca. 0,75 % C	annealed	270	4	185	210	275			
		ca. 0,75 % C	tempered	300	5	170	195	255			
	Low-alloyed steel		annealed	180	6	225	255	335			
			tempered	275	7	185	210	275			
			tempered	300	8	170	195	255			
			tempered	350	9	145	165	215			
		High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	195		
	hardened and tempered		325	11	95	105	140				
M	Stainless steel	ferritic/martensitic	annealed	200	12						
		martensitic	tempered	240	13						
		austenitic	quench hardened	180	14						
		austenitic-ferritic		230	15						
K	Grey cast iron	perlitic/ferritic		180	16				335	390	510
		perlitic (martensitic)		260	17				200	230	300
	Cast iron with spheroidal graphite	ferritic		160	18				225	260	340
		perlitic		250	19				150	175	230
	Malleable cast iron	ferritic		130	20				275	320	420
		perlitic		230	21				185	215	280
N	Aluminium wrought alloys	cannot be hardened		60	22						
		hardenable	hardened	100	23						
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24						
		$\leq 12\%$ Si, hardenable	hardened	90	25						
		$> 12\%$ Si, cannot be hardened		130	26						
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%			110	27					
		CuZn, CuSnZn			90	28					
CuSn, Pb-free copper, electrolytic copper			100	29							
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30						
			hardened	280	31						
		Ni or Co base	annealed	250	32						
			hardened	350	33						
	cast	320	34								
Titanium alloys	pure titanium		R_m 400	35							
α and β alloys	hardened		R_m 1050	36							
H	Hardened steel		hardened and tempered	55 HRC	37						
			hardened and tempered	60 HRC	38						
	Hard cast iron		cast	400	39						
Hardened cast iron		hardened and tempered	55 HRC	40							
X	Non-metallic materials	Thermoplasts			41						
		Thermosetting plastics			42						
		Plastic, glass-fibre reinforced GFRP			43						
		Plastic, carbon fibre reinforced CFRP			44						
		Graphite			45						
		Wood			46						

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Indexable milling – group 7 (XMR01, XMP01)

	Material group	Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]						
						HC (PVD)						
						YBG252			YBG302			
						a_e / D			a_e / D			
1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20							
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	230	265	345	225	260	340	
		ca. 0,45 % C	annealed	190	2	200	230	300	195	225	295	
		ca. 0,45 % C	tempered	250	3	185	215	280	180	210	275	
		ca. 0,75 % C	annealed	270	4	165	190	250	160	185	245	
		ca. 0,75 % C	tempered	300	5	150	175	230	150	170	225	
	Low-alloyed steel		annealed	180	6	200	230	300	195	225	295	
			tempered	275	7	165	190	250	160	185	245	
			tempered	300	8	150	175	230	150	170	225	
			tempered	350	9	130	150	195	125	145	190	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	115	135	180	115	130	170	
		hardened and tempered	325	11	85	95	125	80	95	125		
M	Stainless steel	ferritic/martensitic	annealed	200	12	115	135	175	115	130	170	
		martensitic	tempered	240	13	100	115	145	95	110	145	
		austenitic	quench hardened	180	14	125	145	185	120	140	185	
		austenitic-ferritic		230	15	100	115	145	95	110	145	
K	Grey cast iron	perlitic/ferritic		180	16	255	295	385	250	290	380	
		perlitic (martensitic)		260	17	150	175	230	150	170	225	
	Cast iron with spheroidal graphite	ferritic		160	18	175	200	260	170	195	255	
		perlitic		250	19	115	135	180	115	130	170	
	Malleable cast iron	ferritic		130	20	210	240	315	205	235	310	
		perlitic		230	21	140	160	210	135	160	210	
N	Aluminium wrought alloys	cannot be hardened		60	22							
		hardenable	hardened	100	23							
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24							
		$\leq 12\%$ Si, hardenable	hardened	90	25							
		$> 12\%$ Si, cannot be hardened		130	26							
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%		110	27							
		CuZn, CuSnZn		90	28							
CuSn, Pb-free copper, electrolytic copper		100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30							
			hardened	280	31							
		Ni or Co base	annealed	250	32							
			hardened	350	33							
	cast	320	34									
Titanium alloys	pure titanium		R_m 400	35								
α and β alloys	hardened		R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37							
	Hard cast iron		cast	400	39							
	Hardened cast iron		hardened and tempered	55 HRC	40							
X	Non-metallic materials	Thermoplasts			41							
		Thermosetting plastics			42							
		Plastic, glass-fibre reinforced GFRP			43							
		Plastic, carbon fibre reinforced CFRP			44							
		Graphite			45							
		Wood			46							

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B240.
 For examples of material for cutting tool groups view page D22.

Recommend feed rate

Indexable milling – group1 (FMA07/11/12, FMD02, EMP09/13)

Material group	Feed rate per cutting edge [mm]																		
	EMP09			EMP13			EMP13			FMA07			FMA07			FMA11			
	LNKT12			ANGX11			ANGX15			ONHU06			ONHU08			SNEG12			
	Application																		
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	
P Unalloyed steel		0,25	0,50					0,25			0,19	0,23		0,19	0,23			0,20	0,23
	Low-alloyed steel	0,23	0,47					0,23			0,17	0,22		0,17	0,22			0,19	0,21
	High-alloyed steel and high-alloyed tool steel	0,22	0,44					0,22			0,16	0,20		0,16	0,20			0,18	0,20
M Stainless steel		0,18	0,35															0,14	0,16
K Grey cast iron		0,28	0,55					0,28			0,20	0,26		0,20	0,26			0,22	0,25
	Cast iron with spheroidal graphite	0,25	0,50					0,25			0,19	0,23		0,19	0,23			0,20	0,23
	Malleable cast iron	0,25	0,50					0,25			0,19	0,23		0,19	0,23			0,20	0,23
N Aluminium wrought alloys						0,20				0,21									
	Aluminium-Gusslegierungen					0,20				0,21									
	Copper and copper alloys(bronze/brass)					0,18				0,19									
S Heat-resistant alloys																			
	Titanium alloys																		
H Hardened steel																			
	Hard cast iron																		
	Hardened cast iron																		
X Non-metallic materials																			

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Indexable milling – group 2 (FMA01/02/03/04, FME01/02, EMP01/02/03/04)

Material group	Feed rate per cutting edge [mm]																		
	FMA01 FMA02			FMA03			FMA03			FMA04			FMA04			FME02			
	SEET12			SEKN12			SEKN15			OFKT05			OFKR07			SPK*12			
	Application																		
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	
P Unalloyed steel		0,15	0,20	0,25				0,20			0,20	0,25		0,20	0,25			0,20	
	Low-alloyed steel	0,14	0,19	0,23				0,19			0,19	0,23		0,19	0,23			0,19	
	High-alloyed steel and high-alloyed tool steel	0,13	0,18	0,22				0,18			0,18	0,22		0,18	0,22			0,18	
M Stainless steel	0,11	0,14	0,18				0,14			0,14	0,18		0,14	0,18			0,14		
K Grey cast iron		0,17	0,22	0,28				0,22			0,22	0,28		0,22	0,28			0,22	
	Cast iron with spheroidal graphite	0,15	0,20	0,25				0,20			0,20	0,25		0,20	0,25			0,20	
	Malleable cast iron	0,15	0,20	0,25				0,20			0,20	0,25		0,20	0,25			0,20	
N Aluminium wrought alloys		0,13	0,17	0,21							0,17	0,21		0,17	0,21				
	Aluminium-Gusslegierungen	0,13	0,17	0,21							0,17	0,21		0,17	0,21				
	Copper and copper alloys(bronze/brass)	0,11	0,15	0,19							0,15	0,19		0,15	0,19				
S Heat-resistant alloys		0,11	0,14	0,18							0,14	0,18		0,14	0,18				
	Titanium alloys	0,11	0,14	0,18							0,14	0,18		0,14	0,18				
H Hardened steel																			
	Hard cast iron																		
	Hardened cast iron																		
X Non-metallic materials																			

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Recommend feed rate

Indexable milling – group 3 (FMR01/02/03/04) Face milling

Material group	Feed rate per cutting edge [mm]																		
	FMR01			FMR01			FMR02			FMR02			FMR03			FMR03			
	RCKT10			RCKT12			RCKT12			RCKT16			RCKT20			RDKW07			
	Application																		
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	
P	Unalloyed steel	0,20	0,25		0,20	0,25		0,20	0,25		0,23	0,29		0,26	0,33		0,17		
	Low-alloyed steel	0,19	0,23		0,19	0,23		0,19	0,23		0,21	0,27		0,25	0,31		0,16		
	High-alloyed steel and high-alloyed tool steel	0,18	0,22		0,18	0,22		0,18	0,22		0,20	0,25		0,23	0,29		0,15		
M	Stainless steel	0,14	0,18		0,14	0,18		0,14	0,18		0,16	0,20		0,19	0,23		0,12		
K	Grey cast iron	0,22	0,28		0,22	0,28		0,22	0,28		0,25	0,32		0,29	0,36		0,19		
	Cast iron with spheroidal graphite	0,20	0,25		0,20	0,25		0,20	0,25		0,23	0,29		0,26	0,33		0,17		
	Malleable cast iron	0,20	0,25		0,20	0,25		0,20	0,25		0,23	0,29		0,26	0,33		0,17		
N	Aluminium wrought alloys																		
	Aluminium-Gusslegierungen																		
	Copper and copper alloys(bronze/brass)																		
S	Heat-resistant alloys																		
	Titanium alloys																		
H	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
X	Non-metallic materials																		

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Indexable milling – group 3 (FMR01/02/03/04) Circular milling

Material group	Feed rate per cutting edge [mm]									
	FMR01		FMR01		FMR02		FMR02		FMR03	
	RCKT10		RCKT12		RCKT12		RCKT16		RCKT20	
	Tool diameter [mm]									
	25-32	40-50	50-100	63-125	160-200	80-125	160-250	15		
P	Unalloyed steel	0,12	0,16	0,18	0,24	0,32	0,26	0,35	0,07	
	Low-alloyed steel	0,11	0,14	0,16	0,21	0,28	0,23	0,31	0,06	
	High-alloyed steel and high-alloyed tool steel	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
M	Stainless steel	0,07	0,09	0,10	0,14	0,18	0,15	0,20	0,04	
K	Grey cast iron	0,11	0,14	0,16	0,22	0,29	0,23	0,32	0,06	
	Cast iron with spheroidal graphite	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
	Malleable cast iron	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
N	Aluminium wrought alloys									
	Aluminium-Gusslegierungen									
	Copper and copper alloys(bronze/brass)									
S	Heat-resistant alloys									
	Titanium alloys									
H	Hardened steel									
	Hard cast iron									
	Hardened cast iron									
X	Non-metallic materials									

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Recommend feed rate

Indexable milling – group 4 (BMR01/02/03/04, TMP01, CMZ01, CMA01, CMD01)

Material group		Feed rate per cutting edge [mm]								
		BMR01	BMR01	BMR01	BMR01	BMR02	BMR02	BMR02	BMR03	BMR03
		ZD*08 / SP*06	ZD*11 / SP*06	ZD*13 / SP*09	ZP*22 / SP*12	ROHX12	ROHX16	ROHX20	-	-
		Tool diameter [mm]								
		20	25	32	40-63	12	16	20	16	20
P	Unalloyed steel	0,14	0,21	0,26	0,32	0,10	0,13	0,14	0,13	0,14
	Low-alloyed steel	0,10	0,15	0,18	0,22	0,07	0,09	0,10	0,09	0,10
	High-alloyed steel and high-alloyed tool steel	0,09	0,14	0,17	0,21	0,07	0,08	0,09	0,08	0,09
M	Stainless steel	0,08	0,12	0,14	0,18	0,06	0,07	0,08	0,07	0,08
K	Grey cast iron	0,18	0,27	0,34	0,42	0,13	0,17	0,18	0,17	0,18
	Cast iron with spheroidal graphite	0,13	0,20	0,25	0,30	0,10	0,12	0,13	0,12	0,13
	Malleable cast iron	0,14	0,21	0,26	0,32	0,10	0,13	0,14	0,13	0,14
N	Aluminium wrought alloys									
	Aluminium-Gusslegierungen									
	Copper and copper alloys(bronze/brass)									
S	Heat-resistant alloys									
	Titanium alloys									
H	Hardened steel									
	Hard cast iron									
	Hardened cast iron									
X	Non-metallic materials									

Hinweis: Bei den vorgegebenen Schnittwerten handelt es sich um Richtwerte, welche unter Idealbedingungen ermittelt wurden.
In individuellen Anwendungsfällen sind die Werte anzupassen.

Indexable milling – group 5 (SMP01/03/05)

Material group		Feed rate per cutting edge [mm]								
		SMP01	SMP01	SMP01	SMP01	SMP01	SMP03	SMP03	SMP03	SMP05
		XSEQ1202	XSEQ1203	XSEQ12T3	XSEQ1204	XSEQ12T4	MPHT06	MPHT08	MPHT12	QC16
		Tool diameter [mm]								
		63-100	63-100	63-160	63-160	63-160	80-125	125-200	120-200	25-39
P	Unalloyed steel	0,12	0,12	0,13	0,13	0,14	0,14	0,15	0,16	0,08
	Low-alloyed steel	0,11	0,11	0,12	0,12	0,13	0,13	0,14	0,15	0,08
	High-alloyed steel and high-alloyed tool steel	0,10	0,10	0,11	0,11	0,12	0,12	0,13	0,14	0,07
M	Stainless steel	0,10	0,10	0,11	0,11	0,12	0,12	0,13	0,14	0,07
K	Grey cast iron	0,11	0,11	0,12	0,12	0,13	0,13	0,14	0,15	0,08
	Cast iron with spheroidal graphite	0,11	0,11	0,12	0,12	0,13	0,13	0,14	0,15	0,07
	Malleable cast iron	0,11	0,11	0,12	0,12	0,13	0,13	0,14	0,15	0,07
N	Aluminium wrought alloys									
	Aluminium-Gusslegierungen									
	Copper and copper alloys(bronze/brass)									
S	Heat-resistant alloys									
	Titanium alloys									
H	Hardened steel									
	Hard cast iron									
	Hardened cast iron									
X	Non-metallic materials									

Hinweis: Bei den vorgegebenen Schnittwerten handelt es sich um Richtwerte, welche unter Idealbedingungen ermittelt wurden.
In individuellen Anwendungsfällen sind die Werte anzupassen.

Recommend feed rate

Indexable milling – group 6 (FMD03, FME04, FMP03, HMP01)

Material group	Feed rate per cutting edge [mm]																		
	FMD03			FMD03			FME04			FMP03			FMP03			FMP03			
	LNKT20			LNKT25			LNKT15			LNKT12			LNKT15			LNKT20			
	Application																		
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	
P	Unalloyed steel			0,50			0,50			0,45			0,45			0,45			0,50
	Low-alloyed steel			0,47			0,47			0,42			0,42			0,42			0,47
	High-alloyed steel and high-alloyed tool steel			0,44			0,44			0,40			0,40			0,40			0,44
M	Stainless steel			0,45			0,45			0,40			0,40			0,40			0,45
	Grey cast iron			0,55			0,55			0,50			0,50			0,50			0,55
	Cast iron with spheroidal graphite			0,50			0,50			0,45			0,45			0,45			0,50
K	Malleable cast iron			0,50			0,50			0,45			0,45			0,45			0,50
	Aluminium wrought alloys																		
	Aluminium-Gusslegierungen																		
N	Copper and copper alloys(bronze/brass)																		
	Heat-resistant alloys																		
	Titanium alloys																		
S	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
H	Non-metallic materials																		
X																			

Hinweis: Bei den vorgegebenen Schnittwerten handelt es sich um Richtwerte, welche unter Idealbedingungen ermittelt wurden.
In individuellen Anwendungsfällen sind die Werte anzupassen.

Indexable milling – group7 (XMR01, XMP01)

Material group	Feed rate per cutting edge [mm]									
	XMR01 face milling			XMR01 plunge milling			XMR01 circular milling			
	SDMT/WPGT			SDMT/WPGT			SDMT/WPGT			
	Tool diameter [mm]									
	20-25	30-50	63-160	20-25	30-50	63-160	20-25	30-50	63-160	
P	Unalloyed steel	1,00	1,20	2,00	0,20	0,25	0,30	0,80	0,96	1,40
	Low-alloyed steel	0,93	1,12	1,86	0,19	0,23	0,28	0,74	0,89	1,30
	High-alloyed steel and high-alloyed tool steel	0,70	0,84	1,40	0,18	0,22	0,26	0,70	0,84	1,23
M	Stainless steel	0,50	0,60	1,00	0,14	0,18	0,21	0,56	0,67	0,98
	Grey cast iron	0,90	1,08	1,80	0,22	0,28	0,33	0,88	1,06	1,54
	Cast iron with spheroidal graphite	0,90	1,08	1,80	0,20	0,25	0,30	0,80	0,96	1,40
K	Malleable cast iron	1,00	1,20	2,00	0,20	0,25	0,30	0,80	0,96	1,40
	Aluminium wrought alloys									
	Aluminium-Gusslegierungen									
N	Copper and copper alloys(bronze/brass)									
	Heat-resistant alloys									
	Titanium alloys									
S	Hardened steel									
	Hard cast iron									
	Hardened cast iron									
H	Non-metallic materials									
X										

Hinweis: Bei den vorgegebenen Schnittwerten handelt es sich um Richtwerte, welche unter Idealbedingungen ermittelt wurden.
In individuellen Anwendungsfällen sind die Werte anzupassen.

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Trouble shooting – milling

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Technical information – milling

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Form nonstandard order – milling

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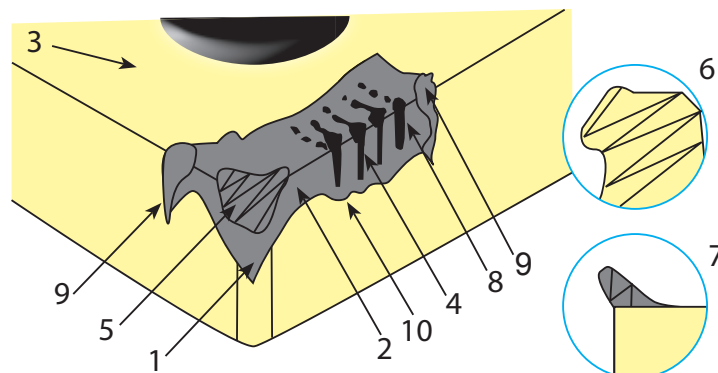
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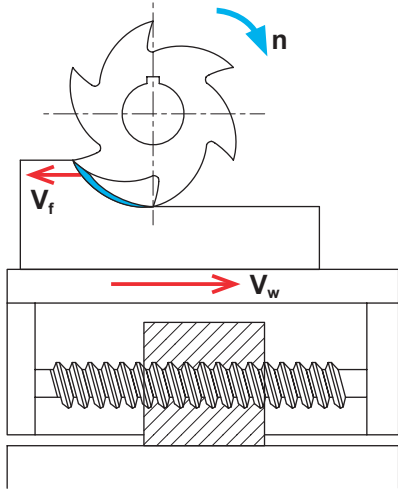
Trouble shooting – indexable milling cutters

See figure	Type of wear	Effects	Reason	Countermeasure
1+2	Flank wear	<ul style="list-style-type: none"> – Bad surface quality and dimensional stability – Increase of cutting force 	<ul style="list-style-type: none"> – Grade not wear-resistant enough – Cutting speed too high – Clearance angle too small – Feed rate too low 	<ul style="list-style-type: none"> – Grade with higher wear-resistance – Reduce cutting speed – Increase clearance angle – Reduce feed rate
3	Crater wear	<ul style="list-style-type: none"> – Bad surface quality and chip control 	<ul style="list-style-type: none"> – Grade not wear-resistant enough – Cutting speed too high – Feed rate too low 	<ul style="list-style-type: none"> – Grade with higher wear-resistance – Reduce cutting speed – Reduce feed rate
4	Chipping	<ul style="list-style-type: none"> – Unstable tool life – Sudden breakage of cutting edge 	<ul style="list-style-type: none"> – Grade too hard – Feed rate too high – Cutting edge not stable enough – Stability of the holder or tension insufficient 	<ul style="list-style-type: none"> – Grade with higher toughness – Reduce feed rate – Change honing of cutting edge – Use a more stable tool holder
5	Breakage	<ul style="list-style-type: none"> – Increase of cutting force – Bad surface quality and dimensional stability 	<ul style="list-style-type: none"> – Grade too hard – Feed rate too high – Cutting edge not stable enough – Stability of the holder or tension insufficient 	<ul style="list-style-type: none"> – Grade with higher toughness – Reduce feed rate – Change honing of cutting edge – Use a more stable tool holder
6	Plastic deformation	<ul style="list-style-type: none"> – Bad dimensional stability – Damage to cutting edge 	<ul style="list-style-type: none"> – Grade not wear-resistant enough – Cutting speed too high – Cutting depth and/or feed rate too high – Temperature on the cutting edge too high 	<ul style="list-style-type: none"> – Grade with higher toughness – Reduce cutting speed – Reduce cutting depth and feed rate – Grade with higher heat-resistance
7	Welding	<ul style="list-style-type: none"> – Increase of cutting force – Bad surface quality 	<ul style="list-style-type: none"> – Cutting speed too low – Cutting edge not sharp enough – Grade not suitable 	<ul style="list-style-type: none"> – Increase cutting speed – Increase rake angle – Use a more suitable grade
8	Thermal cracks	<ul style="list-style-type: none"> – Breakage due to thermal interaction, often caused when cutting is interrupted (milling) 	<ul style="list-style-type: none"> – Temperature fluctuation when machining – Grade too hard 	<ul style="list-style-type: none"> – Dry machining – Grade with higher toughness
9	Notch wear	<ul style="list-style-type: none"> – Burr formation – Increase of cutting force 	<ul style="list-style-type: none"> – Damage through chips (jagged edges) – Feed rate and cutting speed too high 	<ul style="list-style-type: none"> – Grade with higher wear-resistance – Increase rake angle to get a sharper cutting edge – Reduce cutting speed
10	Flaking (coating)	<ul style="list-style-type: none"> – Often appears when machining hardened materials or caused by vibration 	<ul style="list-style-type: none"> – Cutting edge adhesion and chipping – Bad chip removal 	<ul style="list-style-type: none"> – Increase rake angle to get a sharper cutting edge – Chip breaker with bigger chip space

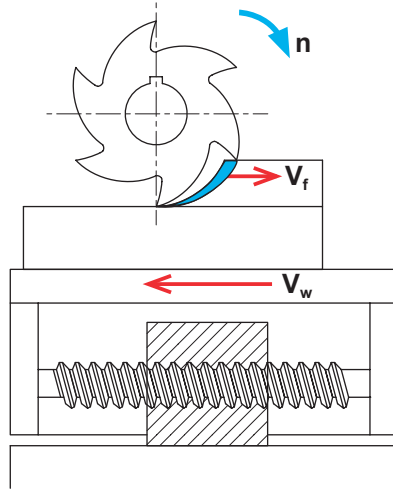


Indexable milling

Difference between up-milling and down-milling



Up-milling



Down-milling

V_f Feed rate tool
 V_w Feed rate work piece
 n Rotation

Up-milling: the feed direction of the work piece is opposite to that of the milling rotation at the connecting position.

Down-milling: the feed direction of the work piece is the same as that of the milling rotation at the connecting position.

Advantages and disadvantages

Direction	Advantages	Disadvantages
Up-milling	<ul style="list-style-type: none"> - Prevents hooking of tool - More smooth cut 	<ul style="list-style-type: none"> - Bigger stress on cutting edge - Shorter tool life
Down-milling	<ul style="list-style-type: none"> - Higher tool life - Less thermal stress 	<ul style="list-style-type: none"> - Hooking of tool possible

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A

Indexable milling

Pitch selection

The pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into wide, normal and fine pitches.

Turning

Operational stability		
L (low)	M (medium)	H (high)
Wide pitch	Normal pitch	Fine pitch
		
When the milling width is equal to the diameter of the cutter, the machining system is stable and main power of machine is sufficient, selecting a wide pitch can achieve high productive efficiency.	General milling function and multiple mixed productions.	When the milling width is less than the diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

B

Milling

C

Approach angle

The approach angle is composed by insert. Tool body, chip thickness, cutting forces and tool life are affected especially by the approach angle. Decreasing the approach angle reduces chip thickness and spreads the cutting area between cutting edge and work piece for a given feed rate.

A smaller approach angle also guarantees stable entering or exiting the work piece, to protect the cutting edge and extend tool life. However this will increase higher axial cutting forces on the work piece, thus it is not suitable for machining thin work pieces such as thin plates.

Drilling

Approach angle	Feed rate per tooth	Max. cutting depth
90°	f_z	$h_{ex} = f_z \times \sin \kappa_r$
75°		$h_{ex} = 0,96 \times f_z$
60°		$h_{ex} = 0,86 \times f_z$
45°		$h_{ex} = 0,707 \times f_z$
Round		$h_{ex} = \frac{\sqrt{f_z^2 \times (iC - 2a_p)^2}}{iC} \times f_z$

D

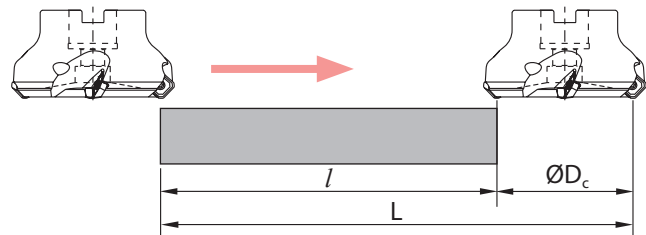
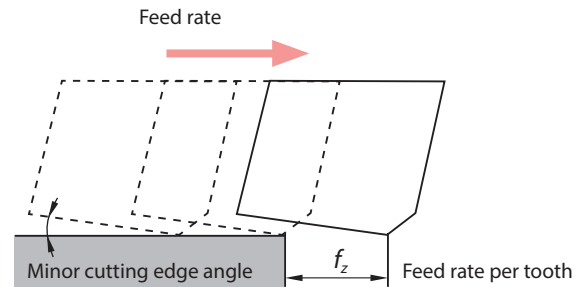
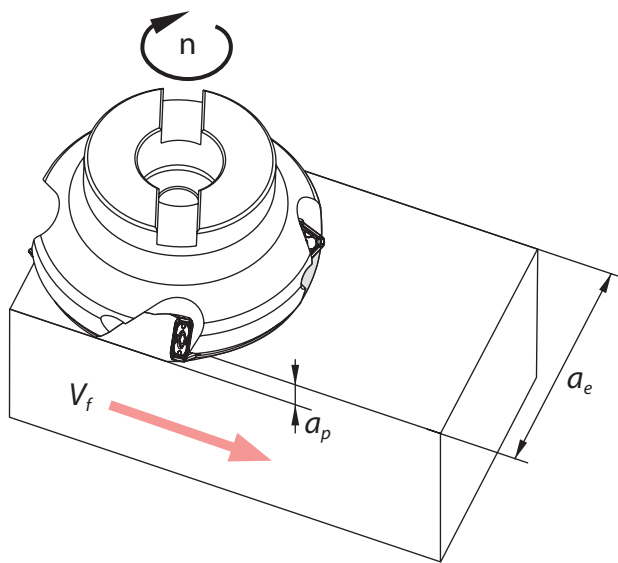
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Indexable milling

General formulas



V_c : Feed rate [m/min]
 D_c : Nominal diameter of milling tool [mm]
 n : Spindle speed [u/min]
 z_n : Number of teeth
 Q : Metal removal rate [cm³/min]

V_f : Feed rate of worktable (feed speed) [mm/min]
 f_z : Feed rate per tooth [mm/z]
 π : ~3,14
 T_c : Machining time [min]
 f_n : Feed rate per revolution [mm/u]

Cutting speed	$V_c = \frac{\pi \times D_c \times n}{1000} \text{ [m/min]}$
Spindle speed	$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ [rev/min]}$
Feed rate of work table	$V_f = f_z \times n \times z_n \text{ [mm/min]}$
Feed rate per tooth	$f_z = \frac{V_f}{n \times Z_n} \text{ [mm/z]}$
Feed rate per revolution	$f_n = \frac{V_f}{n} \text{ [mm/rev]}$
Machining time	$T_c = \frac{1000 \times V_c}{\pi \times D_c} \text{ [min]}$
Metal removal rate	$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ [cm}^3\text{/min]}$

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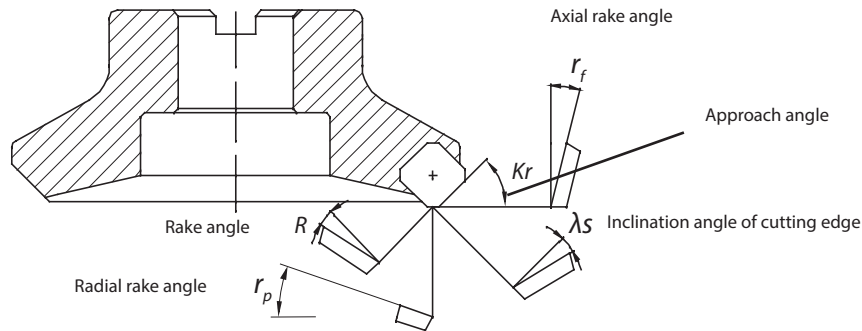
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Indexable milling

Function of angles when face milling



Main angles

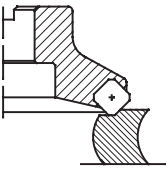
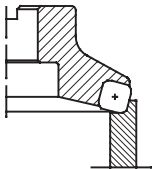
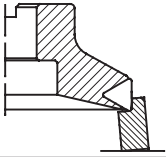
Angle	Feature	Effect		
Axial rake angle r_f	Influences chip direction	Negative angle, good chip removal		
Radial rake angle r_p	Influences cutting edge sharpness	Positive angle, good cutting performance		
Approach angle Kr	Influences chip thickness	$Kr \uparrow$, chip thickness \uparrow , $Kr \downarrow$, chip thickness \downarrow ;		
Rake angle R	Influences cutting force	Poor cutting performance, stable cutting edge	$(-) \leftarrow 0 \rightarrow (+)$	Good cutting performance, unstable cutting edge
Inclination angle λ_s	Influences chip flow direction	Poor cutting performance, stable cutting edge	$(-) \leftarrow 0 \rightarrow (+)$	Good cutting performance, unstable cutting edge

Combination of different rake angles

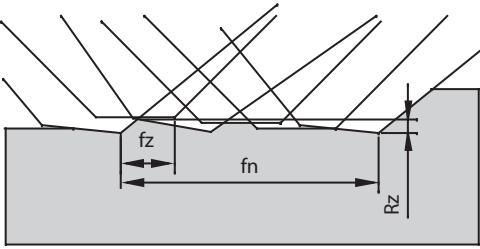
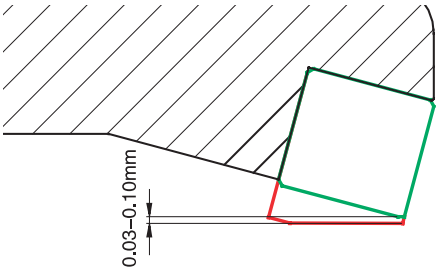
		Double positive	Double negative	Positive/Negative
Negative rake angle				
Neutral angle				
Positive angle				
Axial rake angle r_f		+	-	+
Radial rake angle r_p		+	-	-
Application field	P	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

Indexable milling

Cutting performances of different approach angles

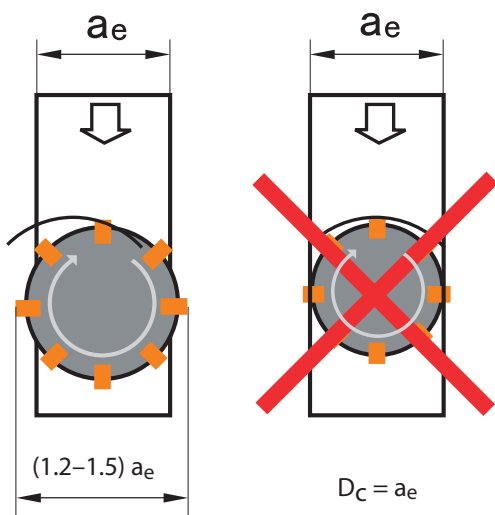
Approach angle	Depiction	Explanation
45°		Axial force is largest. It will bend when machining thin-wall work piece, and reduces the precision of work piece. It is benefit to avoid fringe breakage of work piece when machining cast iron.
75°		The main purpose is to resolve the radial cutting force, it is often used for general face milling.
90°		The axial force is zero in theory, suitable for milling thin plate workpiece.

Inserts with wiper

Using standard inserts	Using inserts with wiper
 <p>Normal surface quality</p>	 <p>High surface quality</p>

The wiper insert must protrude below the other inserts by 0.03–0.10 mm at axial direction, only that the wiping function can take into effect. Generally speaking, a cutter can assemble only one wiper insert. If the diameter of cutter is much bigger or cutter's feed rate per revolution is bigger than the length of wiper edge, 2 to 3 wiper inserts can be assembled.

Cutting width



Generally speaking, the relation between cutting width and tool cutting diameter is $D_C = (1.2-1.5) a_e$.

In the machining practice, it needs to avoid coincidence of tool center and workpiece center as much as possible.

D_C : Tool diameter
 a_e : Lateral infeed

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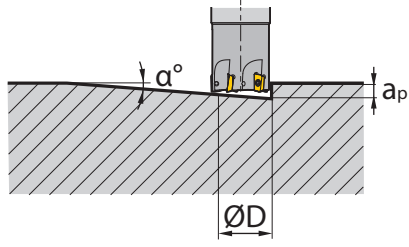
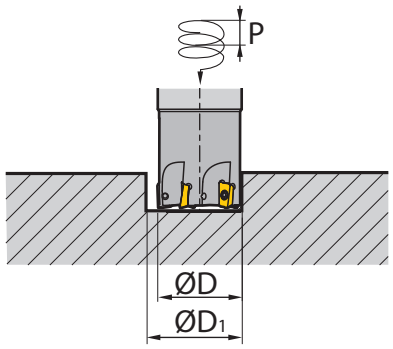
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Indexable milling

Plunging and circular milling with insert APKT

		Plunging		Circular milling	
					
		$L_m = \frac{a_p}{\tan \alpha}$ α: Plunge angle		$P = \tan \alpha \times \pi \times D_1$ α: Helical angle	
Insert	Diameter ØD [mm]	Max. cutting depth ap [mm]	Max. plunge angle α°	Min. diameter ØD1 [mm]	Max. diameter [mm]
AP**11**	16	10	10	20	30
	20	10	5	28	38
	25	10	4	40	48
	32	10	3	56	60
	40	10	2	70	76

Reduce the feed rate when plunging and circular milling.
 For drilling operations (axial) set the feed rate under 0.2mm.
 „Attention“ – drilling can form long chips.

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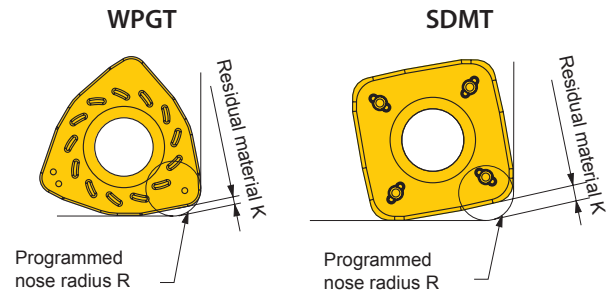
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Plunging and circular milling with insert WPGT or SDMT

Approx. programmed radius

Insert	approx. R [mm]	Residual material K [mm]
WPGT050315ZSR	2	0,5
WPGT060415ZSR	2,5	0,7
WPGT080615ZSR	2,5	0,7
WPGT090725ZSR	4,5	1,2
SDMT06T208	1,6	0,5
SDMT09T312	2,5	0,87
SDMT120412	4,0	0,93
SDMT150620	4,0	1,38



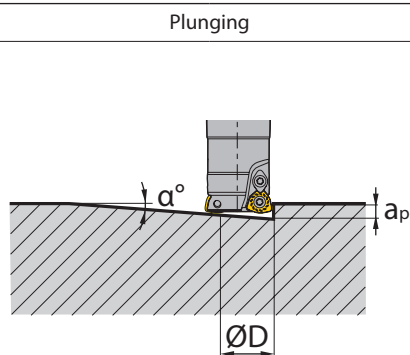
Insert WPGT

Insert	Diameter ØD [mm]	Plunging		Circular milling	
		Max. cutting depth a _p [mm]	Max. plunge angle α°	Min. diameter ØD ₁ [mm]	Max. diameter [mm]
WP**05**	20	1.5	12	24	37
WP**06**	25	1.5	8.8	31	47
	32	1.5	5	45	61
	40	1.5	3.2	61	77
	50	1.5	2.8	81	97
WP**08**	40	1.5	9	52	77
	50	1.5	5.4	71	97
	63	1.5	4.3	97	123
	80	1.5	2.9	131	157
	100	1.5	2.1	171	197
	125	1.5	1.3	221	247
WP**09**	160	1.5	1.1	291	317
	50	3.0	7.2	70	96
	63	3.0	4.5	96	122
	80	3.0	2.8	130	156
	100	3.0	2.2	170	196
	125	3.0	1.6	220	246
	160	3.0	1.2	290	316

Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2 mm.
„Attention“ – drilling can form long chips.

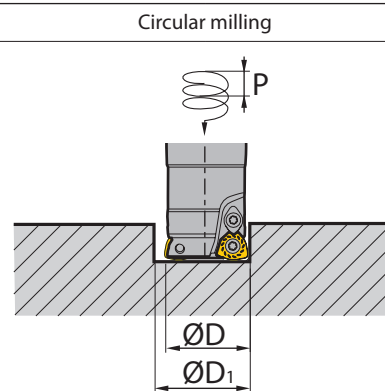
Indexable milling

Insert SDMT



$$L_m = \frac{a_p}{\tan \alpha}$$

α : Plunge angle



$$P = \tan \alpha \times \pi \times D_1$$

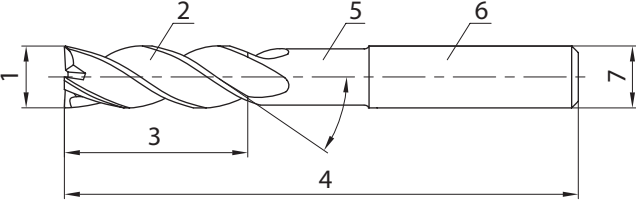
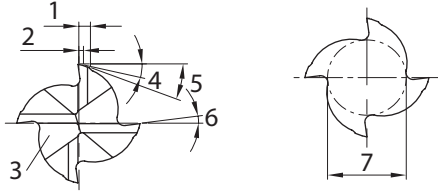
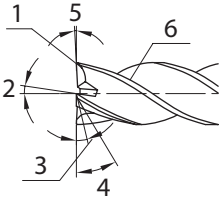
α : Helix angle

Insert	Diameter $\varnothing D$ [mm]	Max. cutting depth a_p [mm]	Max. plunge angle α°	Min. diameter $\varnothing D_1$ [mm]	Max. diameter [mm]
SD**06**	20	0.8	3.6	30	38
	25	0.8	2.8	40	48
	32	0.8	1.6	52	60
	40	0.8	1.1	70	78
	50	0.8	0.8	90	98
	63	0.8	0.7	114	122
SD**09**	25	1.4	6.5	34	48
	32	1.4	4.5	48	62
	35	1.4	3.6	54	68
	50	1.4	1.8	84	98
	63	1.4	1.3	110	124
SD**12**	32	1.8	10.4	44	60
	40	1.8	5.7	60	76
	50	1.8	3.5	80	96
	63	1.8	2.5	106	122
	80	1.8	1.6	140	156
	100	1.8	1.2	180	196
SD**15**	40	2.2	7.3	54	76
	80	2.2	1.4	134	156
	100	2.2	1.0	174	196
	125	2.2	0.9	234	246
	160	2.2	0.6	304	316

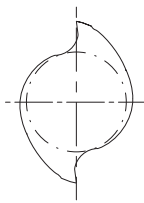
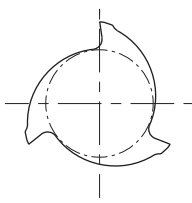
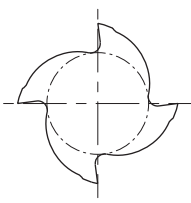
Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0,2mm.
„Attention“ – drilling can form long chips.

Solid carbide mills

Terminology

<p>A</p>		<ol style="list-style-type: none"> 1. Cutting edge diameter 2. Chip pocket 3. Length of cutting edge 4. Total length 5. Neck 6. Shank 7. Shank diameter
<p>B</p>		<ol style="list-style-type: none"> 1. Chamfer width, main cutting edge 2. Chamfer width, diameter 3. Neck, front side 4. Primary radial clearance angle 5. Secondary radial clearance angle 6. Radial rake angle 7. Axial main cutting edge 8. Core diameter
<p>C</p>		<ol style="list-style-type: none"> 1. Cutting edge 2. Axial rake angle 3. Primary axial clearance angle 4. Secondary axial clearance angle 5. Inclination angle 6. Radial cutting edge

Teeth, chip pocket and tool rigidity

Teeth	2 flutes	3 flutes	4 flutes
Cross section			
Cutting edge ratio	54%	56%	60%
Advantages	<ul style="list-style-type: none"> - Large chip pocket - Good chip removal 	<ul style="list-style-type: none"> - Good chip removal - Good surface quality 	<ul style="list-style-type: none"> - Good rigidity - Good surface
Application	<ul style="list-style-type: none"> - Slot milling - Square shoulder milling - Drilling 	<ul style="list-style-type: none"> - Slot milling - Square shoulder milling - Finishing 	<ul style="list-style-type: none"> - Slot milling (flat) - Square shoulder milling - Finishing

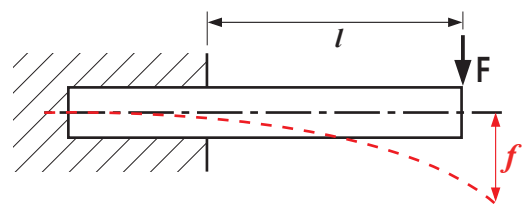
Length of cutting edge (overhang) and cutting diameter

The shorter the overhang, the stronger the rigidity. Thus isn't easy to generate. Bend and vibration in the cutting process may occur.

Length (overhang) increases by 1 time, the deflection degree (f) will be 8 times of the former one.

**Reduce the overhang by 20 %
the deflection degree (f) will decrease by 50 %**

**Increase the diameter by 20 %
the deflection degree (f) will decrease by 50 %**



$$f = \frac{F \times l^3}{3 \times E \times I} = \frac{F \times l^3 \times 64}{3 \times E \times I}$$

A

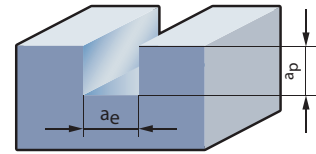
Turning

Solid carbide mills

Machining strategy – HPC/UM (HSC) milling cutters

HPC = High Performance Cutting

Machining with significantly increased metal removal rate through higher cutting speeds and feed rates compared with conventional machine cutting processes.



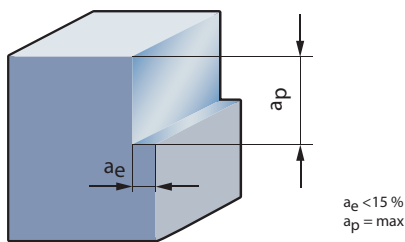
Full-slot milling

B

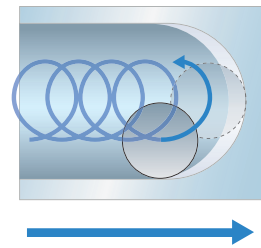
Milling

HSC (UM) = High Speed Cutting

High cutting speeds and feed rates in combination with low cutting depths lead to lower chip thickness as in normal machining.



Profiling

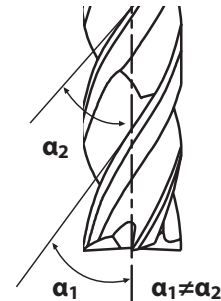
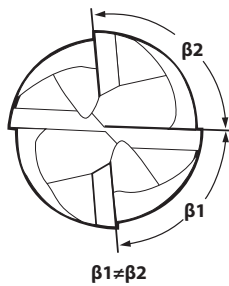


Trochoidal milling

C

Drilling

The UM milling cutter is specifically optimised for HSC machining.



High metal removal rates can be realised with this tool.

Especially on highly dynamic machines with optimised tool paths this milling cutter shows its full potential.

D

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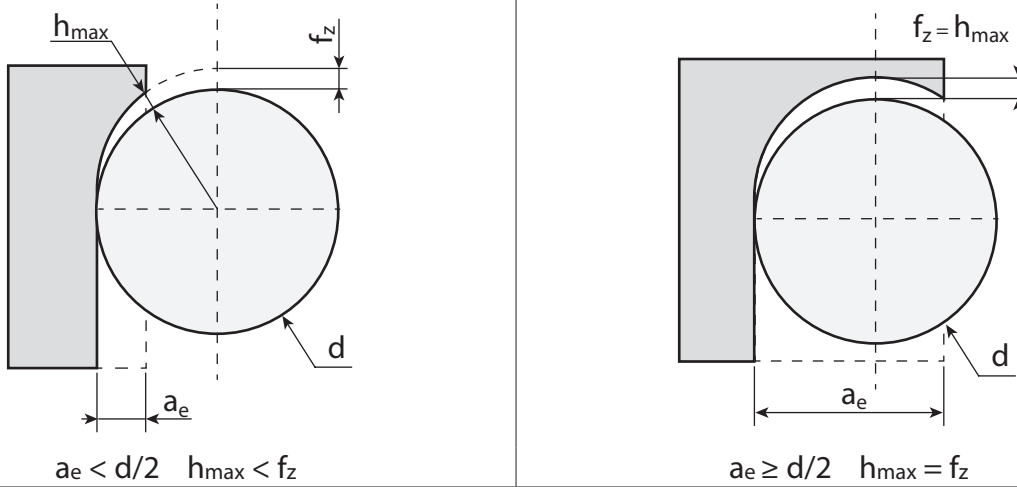
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Solid carbide mills

HSC strategy


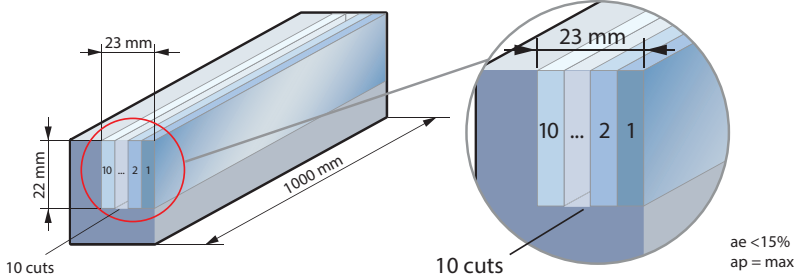
It's important to use the right strategy. When programming make sure the width of cut is kept. The width of cut is usually not higher than 15%. Regarding the depth of cut, the total length of the cutting edge can be used.



$$h_{max} = 2f_z \sqrt{\frac{a_e}{d} \left(1 - \frac{a_e}{d}\right)}$$

When changing the width of cut the cutting data needs to be adjusted. As calculatory size applies a chip thickness from approx. 0.15–0.2 mm on basis of the usual steel types.

Example

Tool	Machining
 <p>UM-4E-D20.0-W KMG405</p>	 <p>HSC strategy</p>

Workpiece material	16MnCr5 (1.7131) ca. 700 N/mm ³
Cutting data	
V _c	550 m/min
n	8750 U/min
f _z	0.3 mm/z (h_{max} = 0.19 mm)
V _f	10500 mm/min
a _p	22 mm
a _e	2.3 mm

Result

Chip removal rate **530 cm³/min!** Machining time 58 seconds! The maximum chip thickness is 0.19 mm.

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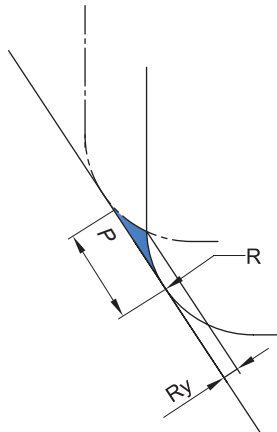
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Solid carbide mills

Feed rate selecting table for profile machining with ball nose cutters and torus mills



$$Ry = R \times \{1 - \cos [\arcsin(fr/2R)]\}$$

Ry: Theoretical values of surface quality

P: Feed rate

R: Radius of the ball nose cutter or torus mill

R	Ry	Feed rate									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.5		0.003	0.010	0.023	0.042	0.067	0.100				
1.0		0.001	0.005	0.011	0.020	0.032	0.046	0.063	0.083	0.107	
1.5		0.001	0.003	0.008	0.013	0.021	0.030	0.041	0.054	0.069	0.086
2.0		0.001	0.003	0.006	0.010	0.015	0.023	0.031	0.040	0.051	0.064
2.5		0.001	0.002	0.005	0.008	0.013	0.018	0.025	0.032	0.041	0.051
3.0			0.001	0.004	0.007	0.010	0.015	0.020	0.027	0.034	0.042
4.0			0.001	0.003	0.005	0.008	0.011	0.015	0.020	0.025	0.031
5.0			0.001	0.002	0.004	0.006	0.009	0.012	0.016	0.020	0.025
6.0				0.002	0.003	0.005	0.008	0.010	0.013	0.017	0.021
8.0				0.001	0.003	0.004	0.006	0.008	0.010	0.013	0.016
10.0				0.001	0.002	0.003	0.005	0.006	0.008	0.010	0.013
12.5				0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010

R	Ry	Feed rate									
		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0.5											
1.0											
1.5		0.104									
2.0		0.077	0.092	0.109							
2.5		0.061	0.073	0.086	0.100						
3.0		0.051	0.061	0.071	0.083	0.095	0.109				
4.0		0.038	0.045	0.053	0.062	0.071	0.081	0.091	0.103		
5.0		0.030	0.036	0.042	0.049	0.057	0.064	0.073	0.082	0.091	0.101
6.0		0.025	0.030	0.035	0.041	0.047	0.054	0.061	0.068	0.076	0.084
8.0		0.019	0.023	0.026	0.031	0.035	0.040	0.045	0.051	0.057	0.063
10.0		0.015	0.018	0.021	0.025	0.028	0.032	0.036	0.041	0.045	0.050
12.5		0.012	0.014	0.017	0.020	0.023	0.026	0.029	0.032	0.036	0.040

Nonstandard – solid carbide end mills

Name/Company: Address: Tel.: Fax: E-mail:	 Wanheimer Str. 57 40472 Düsseldorf, Germany Fax: +49-(0)211-989240-111 E-mail: technik@zccct-europe.com
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

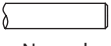

Material	
Material	
Tensile strength (N/mm ²)	
Hardness	




Coating	
Yes <input type="checkbox"/>	No <input type="checkbox"/>

Series			
GM		NM	
PM		AL	
UM		VSM	
HM		HPC	

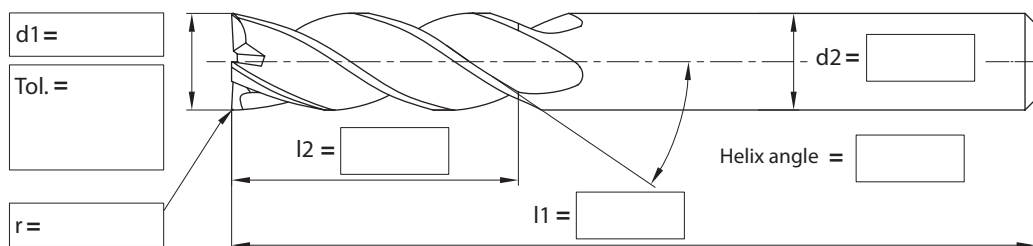
Centre cutting	
Yes <input type="checkbox"/>	No <input type="checkbox"/>

Machining operations		
		
<input type="checkbox"/> Slot milling	<input type="checkbox"/> Square shoulder milling	<input type="checkbox"/> Profile milling

Tool holder type			
DIN6535			
			
Form HA <input type="checkbox"/>	Form HB <input type="checkbox"/>	Normal straight shaft <input type="checkbox"/>	Special type <input type="checkbox"/>

Type		
		
<input type="checkbox"/> Square shoulder mill	<input type="checkbox"/> Ball nose cutter	<input type="checkbox"/> Torus mill

Number of teeth



Remarks:	
Order quantity:	Desired delivery date:
Date:	Signature:

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Comparison table materials

ISO	Country and standard											
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	Russia
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
P	Alloy steel											
	15	1015	1.0401	C15	080M15	-	1350	CC12	C15C16	F.111	-	-
	20	1020	1.0402	C22	050A20	2C	1450	CC20	C20C21	F.112	-	20
	35	1035	1.0501	C35	060A35	-	1550	CC35	C35	F.113	-	35
	45	1045	1.0503	C45	080M40	-	1650	CC45	C45	F.114	-	45
	55	1055	1.0535	C55	070M55	-	1655	-	C55	-	-	55
	60	1060	1.0601	C60	080A62	43D	-	CC55	C60	-	-	60
	Y15	1213	1.7015	9SMn28	230M07	-	1912	S250	CF9SMn28	11SMn28	SUM22	15Ch
	-	12L13	1.0718	9SMnPb28	-	-	1914	S250Pb	CF9MnPb28	11SMnPb28	SUM22L	-
	-	-	1.0722	10SPb20	-	-	-	10PbF2	CF10Pb20	10SPb20	-	-
	-	1140	1.0726	35S20	212M36	8M	1957	35MF4	-	F210G	-	-
	Y13	1215	1.0736	9SMn36	240M07	1B	-	S300	CF9SMn36	12SMn35	-	-
	-	12L14	1.0737	9SMnPb36	-	-	1926	S300Pb	CF9SMnPb36	12SMnP35	-	-
	55Si2Mn	9255	1.0904	55Si9	250A53	45	2085	55S7	55Si8	56Si7	-	-
	-	9262	1.0961	60SiCr7	-	-	-	60SC7	60SiCr8	60SiCr8	-	-
	15	1015	1.1141	Ck15	080M15	32C	1370	XC12	C16	C15K	S15C	15
	40Mn	1039	1.1157	40Mn4	150M36	15	-	35M5	-	-	-	40G
	25	1025	1.1158	Ck25	-	-	-	-	-	-	S25C	25
	35Mn2	1335	1.1167	36Mn5	-	-	2120	40Mn5	-	36Mn5	SMn438(H)	35G2,35GL
	30Mn	1330	1.1170	28Mn6	150M28	14A	-	20M5	C28Mn	-	SCMn1	30G
	35Mn	1035	1.1183	Cf35	060A35	-	1572	XS38TS	C36	-	S35C	-
	Ck45	1045	1.1191	45	080M46	-	1672	XC42	C45	C45K	S45C	-
	55	1055	1.1203	Ck55	070M55	-	-	XC45	C50	C55K	S55C	55
	50	1050	1.1213	Cf53	060A52	-	1674	XC48TS	C53	-	S50C	-
	60Mn	1060	1.1221	Ck60	080A62	43D	1678	XC60	C60	-	S58C	60,60G
	-	1095	1.1274	Ck101	060A96	-	1870	-	-	-	SUP4	-
	-	-	1.3401	X120Mn12	Z120M12	-	-	X120M12	XG120Mn12	X120Mn12	SCMnH/1	110G13L
	Gr15;45Gr	52100	1.3505	100Cr6	534A99	31	2258	100C6	100Cr6	F.131	SUJ2	SchCh 15
-	ASTM A204Gr.A	1.5415	15Mo3	1501-240	-	2912	15D3	16Mo3KW	16Mo3	-	-	
-	4520	1.5426	16Mo5	1503-245-420	-	-	-	16Mo5	16Mo5	-	-	
-	ASTM A350LF5	1.5622	14Ni6	-	-	-	16N6	14Ni6	15Ni6	-	-	
-	ASTM A353	1.5662	X8Ni9	1501-509;510	-	-	-	X10Ni9	XBNI09	-	-	

Comparison table materials

ISO	Country and standard											
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	Russia
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
P	Alloy steel											
	-	2515	1.5680	12Ni19	-	-	-	Z18N5	-	-	-	-
	-	3135	1.5710	36NiCr6	640A35	111A	-	35NC6	-	-	SNC236	-
	-	3415	1.5732	14NiCr10	-	-	-	14NC11	16NiCr11	15NiCr11	SNC415(H)	-
	-	3415 3310	1.5752	14NiCr14	655M13 655A12	36A	-	12NC15	-	-	SNC815(H)	-
	-	9840	1.6511	36CrNiMo4	816M40	110	-	40NCD3	38CrNiMo4(KB)	35CrNiMo4	-	40 ChN2MA
	-	8620	1.6523	21NiCrMo2	850M20	362	2503	20NCD2	20NiCrMo2	20NiCrMo2	SNCCM220(H)	-
	-	8740	1.6546	40NiCrMo2	311-Type7	-	-	-	40NiCrMo2(KB)	40NiCrMo2	SNC240	38ChGNM
	40CrNiMoA	4340	1.6582	34CrNiMo6	817M40	24	2541	35NCD6	35CrNiMo6(KB)	-	-	38Ch2N2MA
	-	-	1.6587	17CrNiMo6	820A16	-	-	18NCD6	-	14CrNiMo13	-	-
	15Cr	5015	1.7015	15Cr3	523M15	-	-	12C3	-	-	SCr415(H)	15Ch
	35Cr	5132	1.7033	34Cr4	530A32	18B	-	32C4	34Cr4(KB)	35Cr4	SCr430(H)	35Ch
	40Cr	5140	1.7035	41Cr4	530M40	18	-	42C4	41Cr4	42Cr4	SCr440(H)	40Ch
	40Cr	5140	1.7045	42Cr4	-	-	2245	-	-	42Cr4	SCr440	40Ch
	18CrMn	5115	1.7131	16MnCr15	(527M20)	-	2511	16MC5	16MnCr15	16MnCr15	-	18ChG
	20CrMn	5155	1.7176	55Cr3	527A60	48	-	55C3	-	-	SUP9(A)	50ChGA
	30CrMn	4130	1.7218	25CrMo4	1717CDS110	-	2225	25CD4	25CrMo4(KB)	55Cr3	SCM420; SCM430	30ChM
	35CrMo	4137;4135	1.7220	34CrMo4	708A37	19B	2234	35CD4	35CrMo4	34CrMo4	SCM432; SCRRM3	AS38ChGM
	40CrMoA	4140;4142	1.7223	41CrMo4	708M40	19A	2244	42CD4TS	41CrMo4	41CrMo4	SCM440	40 ChFA
	42CrMo 42CrMnMo	4140	1.7225	42CrMo4	708M40	19A	2244	42CD4	42CrMo4	42CrMo4	SCM440(H)	-
	-	-	1.7262	15CrMo5	-	-	2216	12CD4	-	12CrMo4	SCM415(H)	-
	-	ASTM A182 F11;F12	1.7335	13CrMo44	1501- 620Gr.27	-	-	15CD3.5; 15CD4.5	14CrMo44	14CrMo45	-	12ChM, 15ChM
	-	-	1.7361	32CrMo12	722M24	40B	2240	30CD12	32CrMo12	F.124.A	-	-
-	ASTM A182 F22	1.7380	10CrMo910	1501- 622Gr.31;45	-	2218	12CD9;10	12CrMo9,10	TU.H	-	-	
-	-	1.7715	14MoV63	1503-660-440	-	-	-	-	13MoCrV6	-	-	
50CrVA	6150	1.8159	50CrV4	735A50	47	2230	50CV4	50CrV4	51CrV4	SUP10	50ChGFA	
-	-	1.8509	41CrAlMo7	905M39	41B	2940	40CAD6,12	41CrAlMo7	41CrAlMo7	-	38ChMJuA	
-	-	1.8523	39CrMoV139	897M39	40C	-	-	36CrMoV12	-	-	-	

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ISO	Country and standard											
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	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
P	Alloy steel											
	T10	W.110	1.1545	C105W1	-	-	1880	Y1105	C98KU C100KU	F.515 F.516	-	U10A
	T12A	W.112	1.1663	C125W	-	-	-	Y2120	C120KU	(C120)	SK2	U13
	CrV;9SiCr	L3	1.2067	100Cr6	BL3	-	-	Y100C6	-	100Cr6	-	-
	Cr12	D3	1.2080	X210Cr12	BD3	-	-	Z200Cr12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1	Ch12
	4Cr5MoVSi	H13	1.2344	X40CrMoV5 1	BH13	-	2242	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	SKD61	4Ch5MF1S
	Cr6WV	A2	1.2363	X100CrMoV5 1	BA2	-	2260	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12	-
	CrWMo	-	1.2419	105WCr6	-	-	2140	105WC13	10WCr6 107WCr5KU	105WCr5	SKS31 SKS2 SKS3	ChWG
	Cr12W	-	1.2436	X210CrW12	-	-	2312	-	X215CrW12 1KU	X210CrW12	SKD2	-
	5CrNiMo	S1	1.2542	45WCrV7	BS1	-	2710	-	45WCrV8KU	45WCrS8	-	-
	3Cr2W8V	H21	1.2581	X30WCrV9 3 X30WCrV93KU	BH21	-	-	Z30WCV9	X28W09KU X30WCrV9 3KU	X30WCrV9	SKD5	3Ch2W8F
	Cr12MoV	-	1.2601	X165CrMoV 12	-	-	2310	-	X165CrMoW12KU	X160CrMoV12	SKD11	-
	5CrNiMo	L6	1.2713	55NiCrMoV6	-	-	-	55NCDV7	-	F.250.S	SKT4	5ChNM
	V	W210	1.2833	100V1	BW2	-	-	Y1105V	-	-	SKS43	-
	W6Mo5Cr4V2Co5	-	1.3243	S6-5-2-5	-	-	2723	Z85WDKCV	HS6-5-2-5	HS6-5-2-5	SKH55	R6M5K5
	W18Cr4VCo5	T4	1.3255	S18-1-2-5	BT4	-	-	Z80WKC 10-05-04-01	X78WCo1805KU	HS18-1-1-5	SKH3	-
	W6Mo5Cr4V2	M2	1.3343	S6-5-2	BM2	-	2722	Z85WDCV 06-05-04-02	X82WMo0605KU	HS6-5-2	SKH9	R6M5
	-	M7	1.3348	S2-9-2	-	-Z-	2782	Z100WCWV 09-02-04-02	HS2-9-2	HS2-9-2	-	-
	W18Cr4V	T1	1.3355	S18-0-1	BT1	-	-	Z80WCV 18-04-01	X75W18KU	HS18-0-1	SKH2	-
	W6Mo5Cr4V3	M3	-	S6-5-3	-	-	-	-	-	-	SKH52	-
-	M42	-	-	BM42	-	-	-	-	-	SKH59	-	

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Comparison table materials

ISO	Country and standard						Main application
	China	USA	Germany	Japan	Daido Steel Co., Ltd (Japan)	Russia	
	GB	AISI/SAE	DIN	JIS	DAIDO	GOST	
P	Plastic die steel						
	-	P20 mod.		-	PX5N		For mass production of large mirror dies. Automobile tail light, front fender of car, video camera, household electrical appliances etc
	-	-		-	NAK55		High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc
	-	-		-	NAK80		High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc
	3Cr13	420 mod.		SUS420J2 mod.	S-STAR		For ultra-mirror corrosion resistant precise dies. Accessories of camera, CD, lens, watch case.
	Cold-working die steel						
	-	02	-	SKS93	YK30		Stamping die, gauge calipers, paper cutter, auxiliary tools
	9CrWMn	01 mod.	-	SKS3 mod.	GOA		Blanking die, gauge calipers, drawing die, taps, Perforated punch.
	Cr12MoV	D2	X165CrMoV12	SKD11	DC11		Blanking die, cold forming die, cold drawing die, forming roller, punch
	-	D2 mod.	-	SKD11 mod.	DC53		Blanking die, cold forming die, cold drawing die, forming roll, punch
	Hot-working die steel						
	4Cr5MoSiV1	H13	X40CrMoV51	SKD61	DHA1		Aluminum-compression die, connecting parts of compression die, hot stamping die, hot extrusion die, thermal shear cutting blade
	-	-	-	-	DH21		Long life Aluminum compression die
	-	-	-	-	DH31-S		Compression die
	-	-	-	-	DH2F		Compression die, plastic die

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ISO	Country and standard											
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	Russia
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
M	Stainless steel											
	0Cr13; 1Cr12	403	1.4000	X6Cr13	403S17	-	2301	Z6C13	X6Cr13	F.3110	SUS403	08Ch13
	-	-	1.4001	X7Cr14	-	-	-	-	-	F.8401	-	-
	1Cr13	410	1.4006	X10Cr13	410S21	56A	2302	Z10C14	X12Cr13	F.3401	SUS410	12Ch13
	1Cr17	430	1.4016	X6Cr17	430S15	60	220	Z8C17	X8Cr17	F.3113	SUS430	12Ch17
	2Cr13	410	1.4021	X20Cr13	562	56B; 56C	-	Z20C13	X20C13	F.3401	SUS410	20Ch13
	-	-	1.4027	G-X20Cr14	420C29	56B	-	Z20C13M	-	-	SCS2	20Ch13L
	4Cr13	-	1.4034	X46Cr13	420S45	56D	2304	Z40CM Z38C13M	X40Cr14	F.3405	SUS420J2	40Ch13
	1Cr17Ni2	431	1.4057	X20CrNi172	431S29	57	2321	Z15CNi6.02	X16CNi16	F.3427	SUS431	20Ch17N2
	Y1Cr17	430F	1.4104	X12CrMoS17	-	-	2383	Z10CF17	X10CrS17	F.3117	SUS430F	-
	1Cr17Mo	434	1.4113	X6CrMo171	434S17	-	2325	Z8CD17.01	X8CrMo17	-	SUS434	-
	-	-	1.4313	X5CrNi134	425C11	-	-	Z4CND13.4M	-	-	SCS5	-
	-	-	1.4408	G-X6CrNiMo1810	316C16	-	-	-	-	F.8414	SCS14	07Ch18N10G2S2M2L
	4Cr9Si2	HW3	1.4718	X45CrSi93	401S45	52	-	Z45CS9	X45CrSi8	F.322	SUH1	40Ch9S2
	0Cr13Al	405	1.4724	X10CrAl13	403S17	-	-	Z10C13	X10CrAl12	F.311	SUS405	10Ch13SJu
	Cr17	430	1.4742	X10CrAl18	430S15	60	-	Z10CAS18	X8Cr17	F.3113	SUS430	15Ch18SJu
	8Cr20Si2Ni	HNV6	1.4757	X80CrNiSi20	443S65	59	-	Z80CSN20.02	X80CrSiNi20	F.320V	SUH4	-
	2Cr25N	446	1.4762	X10CrAl24	-	-	2322	Z10CAS24	X16Cr26	-	SUH446	-
	Austenitic stainless steel											
	0Cr18Ni9	304	1.4301	X5CrNi1810	304S15	58E	2332	Z6CN18.09	X5CrNi1810	F.3551; F.3541; F.3504	SUS304	08Ch18N10
	1Cr18Ni9MoZr	303	1.4305	X10CrNiS189	303S21	58M	2346	Z10CNF18.09	X10CrNiS18.09	F.3508	SUS303	-
	0Cr19Ni10	304L	1.4306	X2CrNi1911	304S12	-	2352	Z2CN18.10	X2CrNi18.11	F.3503	SCS19	03Ch18N11
	-	-	1.4308	G-X6CrNi189	304C15	-	-	Z6CN18.10M	-	-	SCS13	07Ch18N9L
	Cr17Ni7	301	1.4310	X12CrNi177	-	-	2331	Z12CN17.07	X12CrNi1707	F.3517	SUS301	-
	-	304LN	1.4311	X2CrNi1810	304S62	-	2371	Z2CN18.10	-	-	SUS304LN	-
	0Cr19Ni9	304	1.4350	X5CrNi189	304S31	58E	-	Z6CN18.09	X5CrNi1810	-	SUS304	-
	0Cr17Ni11Mo2	316	1.4401	X5CrNiMo1712	316S16	Z6CND17.11	2347	1.4401	X5CrNiMo1712	F.3543	SUS316	-
	00Cr17Ni13Mo2	316LN	1.4429	X2CrNiMo17133	-	-	2375	Z2CND17.13	-	-	SUS316LN	-
	0Cr27Ni12Mo3	316L	1.4435	X2CrNiMo18143	316S12	-	2353	Z2CDN17.13	X2CrNiMo1713	-	SCS16,	03Ch17N14M2
	00Cr19Ni13Mo3	317L	1.4438	X2CrNiMo17133	317S12	-	2367	Z2CND19.15	X2CrNiMo18.16	-	SUS317L	-
-	329L	1.4460	X8CrNiMo275	-	-	2324	-	-	-	SUS329L; SCH11; SCS11	-	
1Cr18Ni9Ti	321	1.4541	X6CrNiTi1810	2337	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553	SUS321	12Ch18N10T	
1Cr18Ni11Nb	347	1.4550	X6CrNiNb1810	347S17	58F	2338	Z6CNNb18.1	X6CrNiTi1811	F.3552	SUS347	08Ch18N12B	
Cr18Ni12Mo2Ti	316Ti	1.4571	X6CrNiMoTi17122	320S17	58J	2350	Z6NDT17.12	X6CrNiMoTi17	F.3535	-	10Ch17N13M2T	

Comparison table materials

ISO	Country and standard											Russia
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	
M	Austenitic stainless steel											
	-	-	1.4581	G-X5CrNiMoNb1810	318C7	-	-	Z4CNDNb1812M	XG8CrNiMo18	-	SCS22	-
	Cr17Ni12Mo3Nb	318	1.4583	X10CrNiMoNb1812	-	-	-	Z6CNDNb1713B	X6CrNiMoTiNb17	-	-	-
	1Cr23Ni13	309	1.4828	X15CrNiSi2012	309S24	-	-	Z15CNS20.1	-	-	SUH309	20Ch20N14S2
	0Cr25Ni20	310S	1.4845	X12CrNi2521	310S24	-	2361	Z12CN2520	X6CrNi2520	F.331	SUH310	20Ch23N18
	Cr15Ni36W3Ti	330	1.4864	X12NiCrSi3616	-	-	-	Z12CNS35.1	-	-	SUH330	-
	-	-	1.4865	G-X40NiCrSi3818	330C11	-	-	-	XG50NiCr3919	-	SCH15	-
	5Cr2Mn9Ni4N	EV8	1.4871	X53CrMnNiN219	349S54; 321S12	-	58B	-	Z52CMN21.0	X53CrMnNiN219	-	SUH35
1Cr18Ni9Ti	321	1.4878	X12CrNiTi189	321S320	58C	-	Z6CNT18.12	X6CrNiTi1811	F.3523	SU321	09Ch18N10T	

ISO	Country and standard										Russia	
	China	USA	Germany	Great Britain	Sweden	France	Italy	Spain	Japan			
K	Nodular cast iron											
	QT400-18	60-40-18	GGG40	400/17	0717-02	FGS370-17	GS370-17	FGE38-17	FCD400	VC 42-12		
	QT450-10	65-45-12	--	420/12	--	FGS400-12	GS400-12	FGE42-12	FCD450	-		
	QT500-7	70-50-05	GGG50	500/7	0727-02	FGS500-7	GS500-7	FGE50-7	FCD500	VC 50-2		
	QT600-3	80-60-03	GGG60	600/7	0732-03	FGS600-2	GS600-2	FGE60-2	FCD600	VC 60-2		
	QT700-2	100-70-03	GGG70	700/2	0737-01	FGS700-2	GS700-2	FGE70-2	FCD700	VC 70-2		
	QT800-2	120-90-02	GGG80	800/2	0864-03	FGS800-2	GS800-2	FGE80-2	FCD800	VC 80-2		
	QT900-2	--	--	900/2	--	--	--	--	--	-		
	Grey cast iron											
	--	NO.60	GG40	--	0140	FGL400	--	--	--	Sc 40		
	HT350	NO.50	GG35	350	0135	FGL350	G35	FG35	FC350	Sc 35		
	HT300	NO.45	GG30	300	0130	FGL300	G30	FG30	FC300	Sc 30		
	HT250	NO.35	GG25	250	0125	FGL250	G25	FG25	FC250	Sc 25		
	HT200	NO.30	GG20	200	0120	FGL200	G20	FG20	FC200	Sc 20		
HT150	NO.20	GG15	150	0115	FGL150	G15	FG15	FC150	Sc 15			
HT100	--	--	100	0110	--	G10	--	FC100	-			

ISO	Country and standard											Russia
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	
H	Hardened materials											
	-	440A	1.4108	X100CrMo03	-	-	2258 08	-	-	-	C4B5	-
	-	610	1.4111	X100CrMoV15	-	-	2534 05	-	-	-	AC4A	-
	-	0-2	-	X65CrMo14	-	-	2541 06	-	-	-	AC4A	-

Comparison table materials

ISO	Country and standard											
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	Russia
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
N	Aluminium-based alloys											
	-	SC64D	3.2373	G-AISI9MGWA			4251	A-57G			C4BS	-
	-	DG-AISI12		G-ALMG5	LM5		4252	A-SU12			AC4A	
	-	356.1			LM25		4244				A5052	
	-	A413.0		GD-AISI12			4247				A6061	
	-	A380.1		GD-AISI8Cu3	LM24		4250				A7075	
	-	A413.1		G-AISI12(Cu)	LM20		4260				ADC12	
	-	A413.2		G-AISI12	LM6		4261					
-	A360.2		G-AISI10Mg(Cu)	LM9		4253						

ISO	Country and standard											
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan	Russia
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS	GOST
S	Nickel based alloys											
	-	5391	LW2 4670	S-NiCr13A16MoNb	mar-46	-	-	NC12AD	-	-		
	-	AMS 5397	LW2 4674	NiCo15Cr10MoAlTi	-	-	-	-	-	-		
	-	5660	LW2.4662	NiFe35Cr14MoTi	-	-	-	ZSNCDT42	-	-		
	-	5383	LW2.4668	NiCr19Fe19NbMo	HR8	-	-	NC19eNB	-	-		
	-	-	2.4631	NiCr20TiAk	Hr401.601	-	-	NC20TA	-	-		-
	-	AMS 5399	2.4973	NiCr19Co11MoTi	-	-	-	NC19KDT	-	-		-
	-	AMS 5544	LW2.4668	NiCr19Fe19NbMo	-	-	-	NC20K14	-	-		
	-	5390A	2.4603	-	-	-	-	NC22FeD	-	-		-
	-	5666	2.4856	NiCr22Mo9Nb	-	-	-	NC22FeDNB	-	-		-
	-	-	2.4630	NiCr20Ti	HR5.2034	-	-	NC20T	-	-		-
	-	4676	2.4375	NiCu30AL3Ti	3072-76	-	-	-	-	-		-
	Cobalt based alloys											
	-	5537C AMS		CoCr20W15Ni	-	-	-	KC20WN	-	-		
	-	5772	LW2.4964	CoCr20W14Ni				KC22WN				
	Titanium alloys											
	-	UNS R54520	3.7115.1	TiAl5Sn2.5	TA14/17	-	-	T-A5E	-	-		
	-							UNS R56400				
	-	-	3.7165.1	TiAl6V4	TA10-13/ TA28		-	UNS R56401	T-A6V	-	-	
	-			TiAl5V5Mo5Cr3								
-	-	3.7185	TiAl4Mo4Sn4Si0.5	-	-	-	-	-	-			

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Comparison table hardness and tensile strength

Hardness				Tensile strength N/mm ²	Hardness				Tensile strength N/mm ²
Rockwell Hardness		Vickers Hardness	Brinell Hardness		Rockwell Hardness		Vickers Hardness	Brinell Hardness	
HRC	HRA	HV	HB		HRC	HRA	HV	HB	
70.0	86.6	1037	—	—	51.0	76.3	525	501	1780
69.5	86.3	1017	—	—	50.5	76.1	517	494	1750
69.0	86.1	997	—	—	50.0	75.8	509	488	1720
68.5	85.8	978	—	—	49.5	75.5	501	481	1690
68.0	85.5	959	—	—	49.0	75.3	493	474	1660
67.5	85.2	941	—	—	48.5	75.0	485	468	1630
67.0	85.0	923	—	—	48.0	74.7	478	461	1605
66.5	84.7	906	—	—	47.5	74.5	470	455	1575
66.0	84.4	889	—	—	47.0	74.2	463	449	1550
65.5	84.1	872	—	—	46.5	73.9	456	442	1525
65.0	83.9	856	—	—	46.0	73.7	449	436	1500
64.5	83.6	840	—	—	45.5	73.4	443	430	1475
64.0	83.3	825	—	—	45.0	73.2	436	424	1450
63.5	83.1	810	—	—	44.5	72.9	429	418	1430
63.0	82.8	795	—	—	44.0	72.6	423	413	1405
62.5	82.5	780	—	—	43.5	72.4	417	407	1385
62.0	82.2	766	—	—	43.0	72.1	411	401	1360
61.5	82.0	752	—	—	42.5	71.8	405	396	1340
61.0	81.7	739	—	—	42.0	71.6	399	391	1320
60.5	81.4	726	—	—	41.5	71.3	393	385	1300
60.0	81.2	713	—	2555	41.0	71.1	388	380	1280
59.5	80.9	700	—	2500	40.0	70.8	382	375	1260
59.0	80.6	688	—	2450	40.0	70.5	377	370	1245
58.5	80.3	676	—	2395	39.5	70.3	372	365	1225
58.0	80.1	664	—	2345	39.0	70.0	367	360	1210
57.5	79.8	653	—	2295	38.5	—	362	355	1190
57.0	79.5	642	—	2250	38.0	—	357	350	1175
56.5	79.3	631	—	2205	37.5	—	352	345	1160
56.0	79.0	620	—	2160	37.0	—	347	341	1140
55.5	78.7	609	—	2115	36.5	—	342	336	1125
55.0	78.5	599	—	2075	36.0	—	338	332	1110
54.5	78.2	589	—	2035	35.5	—	333	327	1095
54.0	77.9	579	—	1995	35.0	—	329	323	1080
53.5	77.7	570	—	1955	34.5	—	324	318	1065
53.0	77.4	561	—	1920	34.0	—	320	314	1050
52.5	77.1	551	—	1885	33.5	—	316	310	1035
52.0	76.9	543	—	1850	33.0	—	312	306	1020
51.5	76.6	534	—	1815	32.5	—	308	302	1010

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Comparison table hardness and tensile strength

Hardness					Tensile strength N/mm ²	Hardness					Tensile strength N/mm ²
Rockwell Hardness		Vickers Hardness	Brinell Hardness			Rockwell Hardness		Vickers Hardness	Brinell Hardness		
HRC	HRA	HV	HB			HRC	HRA	HV	HB		
32.0	—	304	298		995	24.0	—	249	245		820
31.5	—	300	294		980	23.5	—	246	242		810
31.0	—	296	291		970	23.0	—	243	240		800
30.5	—	292	287		960	22.5	—	240	237		790
30.0	—	289	283		950	22.0	—	237	234		785
29.5	—	285	280		935	21.5	—	234	232		775
29.0	—	281	276		920	21.0	—	231	229		765
28.5	—	278	273		910	20.5	—	229	227		760
28.0	—	274	269		900	20.0	—	226	225		750
27.5	—	271	266		890	19.5	—	223	222		745
27.0	—	268	263		880	19.0	—	221	220		735
26.5	—	264	260		870	18.5	—	218	218		730
26.0	—	261	257		860	18.0	—	216	216		725
25.5	—	258	254		850	17.5	—	214	214		715
25.0	—	255	251		835	17.0	—	211	211		710
24.5	—	252	248		830						

Note: The conversion values for steel in the table are commonly applicable for the steels with carbon from low to high.

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Conversion table chip breakers – turning

ISO	Application	ZCC-CT		Sandvik		Seco		Kennametal		ISCAR		Walter		Mitsubishi		Sumitomo		Tungaloy		Kyocera		Korloy		Ingersoll Tague Tec		
		Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	
P	Wiper-finishing	WG		WF WL	WF WK	W-MF2	W-F1	FW MW	FW MW	WF		NF	PF	SW	FW	NLU-W	NLU-W	ASW		WP	VW LW			WS		
	Finishing	DF EF	SF HF	PF QF	PF UF 23	FF1 MF1	FF1 F1	FF FN	11 UF LF	SF		FF FS	FH FS	FJ FV	NSE NSU NLU NFA NLF	NLU NFP NFK	PF 01	DP GP VF	CF	VG VF VL	VF			FG FC VF	FA SA FG	
	Semi-finishing	DM EM	HM	PM QM	PM UM	MF2	F2	FN	MF		NF TF SM	14 16 17 19	P55	SH SA	SW SV MV	NSX	TSTMA S	HQ CQ CJ	CK DP GP VF XP	VQ VC VB	HMP			WT ML	WT	
	Medium machining to light roughing	DM PM	HR	PM QM	PR UR	M3 MF3	F2	MN	MF		GN PP NR	17 19	PM5	MV MZ MA	MV MW	NMU NSF	TM DM	GS GS HS PS	HQ XQ GK G	VM				PC MC MT MG MF	PC MT PMR	
	Wiper-medium			WR WM	WM	W-M3 W-R4 W-R7	W-F2	MW RW	MW		WG		NM	MW		NGU-W		WQ								
	Roughing	DR		PR QR 31		M5 MR5 MR7		RP UN RN			TNM GN	19		GH MAT MT		NMU NMX		PT GT HT	G St-form	HR					RT	
	Single side roughing	HDR 31HPR DR LR		HR QR		R8 RR9 -56 -57 -LUX		RH RM RP			NM		NR6 NR8	HA HZ HH HV HX		NMP NHG NHP NHU NHW		HX		GH VH VT					HT HD HY HZ RX RH	CMX
	Wiper-finishing	WG		WF WL WMX	WF WK	W-MF2		FW MW	FW MW		WF		PF	SW	FW	NLU-W										
	Finishing	EF DF	EF HF	MF	MF UF	FF1 F2 MF1	F1	FF FP	11 UF LF		NF VL	PF SM	NF4	PF4 PF5	F5	EJ FV	NSU NLU	SS	SS	SS	GU				EA SF	FG
	Semi-finishing	EF EM	EF HM	MF MM	MF UM	MF3	F2	FP	MF		PP TF	14 16 17 19	NM4	SH MS MV	SW SV MV	NEX NUP		MS	MS	MS	MS	CK DP GP VF XP	VP2	HMP		
Medium machining to light roughing	EM DM	EM HM	MM	MM UM	R6 S6	F2	MP	HP		PP TF	17 19	NM4 NR4	MS ES MH	MV MW	NGU	SA S	PM	PM						EM SU MT	MT PMR WT	
Wiper medium			WR WM	WM	W-M3		MW RW	MW		WG			MW		NGU -W											
Roughing	ER DR	HR	MR QR PR	MR	R7 R8		MP-P			HTW NR	19	NR4	GH HZ		NMU NMX NHG								VM	ET	CMX	
Single side roughing	ER DR HDR LR		HR QR		-56		RP			NM					NMP NHG NHP NHU NHW											



Conversion table chip breakers – turning

ISO	Application	ZCC-CT		Sandvik		Seco		Kennametal		ISCAR		Walter		Mitsubishi		Sumitomo		Tungaloy		Kyocera		Korloy		Ingersoll Tague Tec	
		Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos
K	Wiper-Finishing	WG		WF	WF	W-MF2	W-F1	FW/MW	FW/MW	WF							NLU-W	NLU-W							
	Finishing	DF	HF	KF	KF	F1	F1	FF FN	11 UF LF	NF SM	14 19	PS5				NSU	NSU	C			VM				
	Semi-finishing	PM	HM	KF KM	KF KM	M3	F2	FN	MF	GN	14 19	NM5	PM5	GH		NUX NGU	NSU	C Stand. form	CM		B25	HMP			
	Medium machining to light roughing	DR	HM HR	KM QM	KM	M3	F2	UN	HP	GN NR		NM6	PM5			NUZ NGU NLU	NMU	GC ZS	CM		VK GR	C25	MT MG	MT PMR WT	
N	Wiper medium					W-M3 W-R4 W-R7		MW	MW	WG		NM	PM			NGU-W									
	Roughing	DR +NMA	HR	KR QR	KR UR	M5				NR		NR6		GH		NMU		ZS			MA		RT	CMX	
	Finishing		LC		AL			LF	LF	NF			PM2												
	Semi-finishing		LC		AL		AL	GP		NF PP	AS											HA	AK	FL SA	
S	Medium machining to light roughing		LH		AL		AL	GG-FS MS	HP	NMS													AR		
	Finishing	NF EF	NF	NGP	MF	MF1		FS	GT-HP	SF PF	PF SM	PF4		FJ		NSU	NSU						VP1		
	Semi-finishing	NF NM EM	NF	23	MM	MF1 M1		FS MS	GT-MF	SF PF	PF SM	PF5		MJ		NEX NUP	NSU NSK						VP2	AK	
	Medium machining to light roughing	NM EM		MF	MM UM	M1		MS	MT-LF	PP TF		PS5	MS			NMU	NSK						VP3	HMP	SU
S	Roughing	ER		SR		MR3 MR4		RP		TF HTW NR				GJ									VM		

Conversion table grades – turning

Coated cemented carbide CVD

ISO	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec	Widia			
P	Steel	P01-05	GC4205 GC4305	KCP05 KC9105	AC805P	UE6005 UE6105	T9005 T9105	CA5505	WPP01 WPP05	IC8150 IC9150 IC428	TP0500 TP0501					
		P10-15	GC4315 GC4215	KCP10 KC9110	AC810P AC700G	UC6110 MY5015	T9015 T9115	CA510 CA5515 CA510	WPP10 WPP10S	IC8150 IC8250 IC9150 IC9250 IC9015	TP1500 TP1501	NC3010	TT8115 TT8125	WP15CT		
		P20-25	GC4325 GC4225 GC4025	KCP25 KC9125	AC820P AC8020P AC900G AC2000	UE6020 MC6025	T9025 T9125	CA5525 CA525 CR9025	WPP20 WPP20S	IC8150 IC8250 IC9250 IC9025	TP2501 TP2500 TP200	NC3220 NC3120	TT8125 TT3500	WP25CT		
		P30-35	GC4335 GC4235 GC4035	KCP30 KC8050	AC830P AC3000	UE6035 UE6400	T903 T9135	CA530 CA5535 CA535	WPP30 WPP30S	IC8250 IC8350 IC9350	TP3500	NC3030 NC5330 NC500H	TT5100 TT8135	WP35CT		
		M	Stainless steel	M10	GC2015 GC1515	KCM15	AC610M	MC7015	T9115		IC8250 IC9250 IC6015			TT9215	WM15CT	
				M20	GC2015 GC2025	KCM25 KC9225	AC610M AC650M	US7020 MC7015 MC7025	T6020 T6120 T9125	CA6515	WAM20	IC8250 IC9350 IC9025 IC6025	TM 2000 TP200 TP2500	NC9025	TT5100 TT9225	WM25CT
				M30	GC2025 GC2035	KCM25 KCM35 KC9225	AC630M AC6030M AC830P AC3000	US735 US7025	T6030 T6130	CA6525	WAM30	IC8350 IC9350 IC9025	TP3500 TM 4000		TT5100 TT7100 TT9235	WM35CT
		K	Cast Iron	M40	GC2035	KCM35 KC9240 KC9245	AC630M AC6030M AC830P AC3000	US735	CA6525		IC6025 IC9350	TP 40		TT5100 TT7100 TT9235	WK05CT	
				K01-05	GC3005 GC3205	KCK05	AC405K AC410K	UC5005 UC5105	T5105	CA4505		IC5005 IC9007		NC6205	TT1300 TT7005	WK05CT
				K10-15	GC3215	KCK15 KC9315	AC410K AC415K AC420K AC700G	MC5015 UC5115 MY5015	T5105 T5115	CA4010 CA4515 CA4115	WAK10 WAK10S	IC9015 IC9007 IC8150 IC5010 IC428 IC4028 IC9150	TK1001 TK1000	NC6210	TT1300 TT7310 T7015	WK20CT
K20-25	GC3225	KCK20 KC9320	AC420K AC900G	MC5015 UC5115 UE6110 MY5015	T5125 T9125	CA4125	WAK20 WKK20S	IC5010 IC428 IC4028 C9150	TK2000 TK2001	NC5330		WK20CT				

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Conversion table grades – turning

Coated cemented carbide PVD

ISO	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec	Widia	
P	P01-05	GC1105					PR1005							
	P10-15	GC1515 GC1115 GC1025	KC5010 KC5510 KC7215 KC7315	AC510U	VP10MF VP15TF	AH710	PR930 PR1005 PR930 PR115	WSM10 WXN10	IC520N IC507 IC570 IC807 IC907 IC908					
	P20-25	GC1515 GC1125 GC1025	KC5025 KC5525 KU25T	AC520U	VP20RT VP20MF	AH725 AH120	PR930 PR1025 PR1225	WSM20 WMP205 WSM21	IC228 IC250 IC308 IC828 IC350 IC354 IC507 IC807 IC808 IC907 IC908 IC928 IC1008 IC1028 IC3028	CP200 CP250 TP2000 TS2500		TT8020 TT9020		
P30-35	GC1125 GC2035	KC7335	AC530U		SH730 J740 GH130 AH740	PR660	WSM30	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028	CP500	PC5300				
M	M10	GC1105 GC1115 GC1025 GC1125 GC1515	KCU10 KC5010 KC5510 KC6005 KC6015	EH10Z AC510U AC530U	VP10MF	AH710	PR915 PR1005	WSM10	IC330 IC354 IC507 IC520 IC570 IC807 IC1028 IC3028	CP500 TS2000	PC8110	TT5080	WS10PT	
	M20	GC1025 GC1125	KC501 KCU25	AC520U AC530U	VP10RT VP20RT VP20MF	AH120 AH725 SH730 AH710 AH630 GH330	PR1025 PR1125 PR1225	WSM10 WMP205 WSM20 WSM21	IC228 IC250 IC354 IC808 IC908 IC1008 IC1028 IC3028	TS2000 TS2500 CP200 CP250		TT8020 TT9020 TT9080	WS25PT	
	M30	GC2035	KC5025 KCU25		VP10RT VP20RT VP20MF MP7035	AH12 AH725 SH730 AH710 AH630 GH330 J740	PR1025 PR1125	WSM20 WSM21 WSM30	IC228 IC250 IC328 IC330 IC1008 IC1028 IC3028	CP500 TS2500	PC5300 PC9030			
S	S05	S05F		MP9005	MP9005	AH905		IC507 IC907						
S	S10	GC1105 GC1115	KC5010 KCU10 KC5510 KC510	AC510U EH510Z	MP9015 VP10RT	AH905 SH730 AH110 AH120		WSM10	IC507 IC807 IC808 IC907	CP200 CP250 TS2000 TS2500	PC8110	TT5080	WS10PT	
	S20	GC1025 GC1125 GC1515	KC5010 KCU10 KC5025 KCU25 KC5525	AC520U EH520Z	MP9015 MT9015 VP20RT	AH120 AH725	PR1125	WSM20 WSM21 WSM30	IC507 IC807 IC907	CP250 TS2500 CP500	PC5300	TT5080 TT8020 TT9080	WS25PT	
	S30			AC520U	VP15TF	AH725	PR1125	WSM30	IC3028 IC808 IC830		PC5400	TT8020		
N	N10	GC1515	KC5410				WXN10	IC520						

Conversion table grades – turning

Cermet

ISO	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tunggaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec	Widia	
P	P01-05	CT5005		T110A T1000A	AP25N VP25N	NS520 AT520 GT520 GT720	TN30 TN6010 PV30 PV7010		IC20N IC520N		CN1000 CC105	CT3000 PV3010		
	P10-15	CT5015 CT530	KT315 KT125	T1200A T2000Z T1500A T1500Z	NX2525 AP25N VP25N	NS520 NS730 GT730 PV60 NS9530 GT9530	TN60 TN6010 PV60 PV6010	CM TP1020 TP1030 CMP	IC20N IC520N IC530N		CN1000 CT10 CN2000 CC115	CT3000 PV3010	TT115	
	P20-25	GC1525	KT325 KT1120 KT5020	T1200A T2000Z T1500A T1500Z	NX2525 NX3035 AP25N VP25N MP3025	NS530 NS730 GT730 NS9530 GT9530	TN60 IC30N PV60 PV7020 PV7025	CM TP1020 TP1030 CMP	IC20N IC30N IC75T IC520N IC530N		CN20 CN2000 CC115			TT115
	P30-35			T3000Z	MP3025 VP45N		PV7025 PV90		IC75T					
M	M10	GC1525	KT125	T110A T1000A T1500Z T2000Z	NX2525 AP25N VP25N	NS520 AT530 GT530 GT720	TN60 TN6020 PV60 PV7020			CM TP1020 TP1030 CMP		CT3000 PV3010	TT115	
	M20	CT5015 CT530	HT2	T110A T1000A T1500Z T2000Z	NX2525 AP25N VP25N	NS530 GT730 NS730	TN90 TN6020 PV90 PV7020 PV7025					CT3000 PV3010	TT115	
	M30			T3000Z										
	M40													
K	K01-05			T110A T1000A T2000Z T1500Z	NX2525 AP25N	NS520 GT730 NS730	TN30 TN6010 PV30 PV7005 PV7010				CN1000	CT3000 PV3010		
	K10-15	CT5015	KT325 KT125	T1200A T1500A T2000Z T1500Z	NX2525 AP25N	NS520 GT730 NS730	TN60 TN6020 PV60 PV7020 PV7025				CN1000	CT3000 PV3010		
	K20-25	CT5015		T3000Z	NX2525 AP25N									

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Conversion table grades – turning

Uncoated carbide

ISO	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec	Widia
N Non-ferrous metals	N01	H10 H13A	KF1	H1		KS05F				883 890			
	N10	H10 H13A	K313 KF1 THM-F	H1	HT110	KS15F	KW10	WK01 WK10	IC20	890 KX HX	H01	K10	THM
	N20	H10 H13A	K313 KF1 THM-F			KS15F	KW15		IC20	KX HX			

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Conversion table grades – milling

CVD milling grades

Material / Class	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tunggaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec
P	P05	K20W GC4220		F7010								
	P10	K20W GC3040 GC4220 GC4230		ACP100	F7010				IC4100 IC5100	MP1500	NC5330 NCM325	IN6505 IN6520
	P20	GC3040 GC4230		CS3000	FH7020	T3130		WKP25 WKP255	IC4050 IC4100 IC5100 IC5400	MP1500 MP2500 MS2500 T25M	NC5330 NCM325	IN6505 IN6520 IN7035
	P30	GC2040 GC4240	KC930M KC935M	CS3000	F7030	T3130		WKP35 WKP355 WTP35	IC4050 IC5400	MK3000 T25M T350M	NCM325	IN7035 IN6530
	P40	GC2040 GC4240								T350M		IN6530
	M10	GC4230		F7010						MP1500	NCM325 NC5330	IN6520
	M20	GC4230		F7020	F7020	T3130			IC4050	MP1500 MP2500 MS2500 T25M	NCM325 NCM335	IN7035 IN6520 IN6505
	M30	GC2040 GC4240	KC930M KC935M	F7030	F7030	T3130		WTP35		MP2500 MS2500 T25M T350M	NCM335	IN6530 IN7035 IN6505
	M40	GC2040 GC4240								T350M		IN6530
	K	K05		KCK15		F7010 MC5020				DT7150 IC4100		
K10		K20W	KCK15	ACK200	F7010 MC5020	T1115		WAK15	DT7150 IC4100 IC4010	MP1500 MK1500	NC5330	IN6520
K20		K20W		ACK200		T1115		WKP25 WKP255	DT7150 IC4100	MP1500 MP2500 MS2500 T25M MK1500	NC5330	IN6530 IN6515 IN6520
K30			KC930M KC935M					WKP35 WKP355	IC4050	MK3000 MP2500 MS2500		IN6530 IN6515

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Conversion table grades – milling

CVD milling grades

Material / Class	S05	S10	S20	S30	N05	N10	N20	H05	H10	H20
S Heat-resistant alloys										
N Non-ferrous metals										
H Hardened materials										
ZCC-CT										
Sandvik				GC2040					K20W	K20W GC3040
Kennametal										
Sumitomo										
Mitsubishi										
Toshiba Tungaloy										
Kyocera										
Walter				WTP35						
Iscar										
SECO	MK3000		MP2500 MS2500 T25M	MM4500 T350M			MP2500 25M			
Korloy										
Ingersoll Tague Tec			IN7035 IN6520							

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Conversion table grades – milling

PVD milling grades

Material / Class	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tunggaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec
P Steel	P05			ACZ120	VP05HT	GH130			IC903			IN2004 IN2006
	P10	GC1010 GC1025 GC1020	KC522M KC525M KC610M KC643M KC715M	ACZ10M ACZ20W	VP10H	AH120 GH130	PR730 PR1225 PR1525	WXH15 WHH15 WXM15	IC903 IC950 IC1008	F15M		
	P20	GC1020 GC1025 GC1010 GC2030	KC522M KC525M KC643M KC715M KC725M	ACP200 ACZ330 ACX70 ACW30 AC350 ACZ50M	VP15TF VP20M VP20RT	AH725 AH120 AH130 AH330 AH725 AH730 GH330	PR630 PR830 PR730 PR1225 PR1230 PR1525	WXM15	IC810 IC380 IC830 IC900 IC908 IC910 IC950 IC1008	F25M MP3000	PC3500 PC3600	IN2006 IN1030 IN2004 IN2005 IN2015 IN2030 IN2505 IN2540
	P30	GC1030 GC2030	KC530M KC725M KC735M	ACP200 ACP300 ACZ50M ACZ330 ACZ350 ACX70 ACW30 AC350	VP30RT	AH740 AH130 AH140	PR630 PR660 PR830 PR1230	WXM35	IC300 IC328 IC830 IC900 IC928 IC350 IC808 IC908	F30M MP3000	PC3500 PC3600 PC3300 PC3545 PC9570T	IN1030 IN2005 IN2015 IN2030 IN2035 IN2040 IN2505 IN2530 IN4035
	P40	GC1030	KC735M	ACP300 ACZ350		AH140 AH750		WXP45 WSP45 WSP46	IC300 IC328 IC928	F40M	PC5300 PC3545	IN2035 IN2040
	M10	GC1020	KC522M KC610M KC643M KC715M	ACZ20W ACZ350 EH20Z	AH330 GH110 GH130	PR730 PR1225 PR660 PR1525			PR730 PR660 PR1025 PR1225 PR1525	F15M	PC8110	IN2505
	M20	GC1020 GC1025 GC1030 GC203	KC522M KC525M KC610M KC715M KC725M	ACP200 ACZ50M ACZ20M ACZ350 EH20Z AC350	VP15TF VP20RT	AH725 AH730 GH110	PR730 PR1025 PR660 PR1225 PR1525	WXM15		F25M MP3000	PC5300 PC8110 PC9530	IN2005 IN2015 IN2505
	M30	GC1040 GC203	KC525M KC530M KC725M KC735M	ACP300 ACZ50M ACX80 AC350	VP30RT	AH740 AH120 AH130 GH330 GH340				F30M MP3000	PC9530 PC3545 PC9570T	IN1030 IN2015 IN2030 IN2035 IN2530 IN4035
	M40	GC1040	KC530M KC735M	ACP300 ACX80		AH140 AH750 GH330 GH340		WSM35 WSM36 WXM35		F40M	PC3545	IN1030 IN2030 IN2035 IN2530 IN4035
	K05	GC1010	KC510M	ACZ10M ACZ120 ACZ310		AH330	PR905 PR1210 PR1510			MH1000	PC8110	IN2510
K10	GC1010	KC510M KC520M KC620M KC643M	EH20Z ACZ310		AH120 AH330 AH725	PR905 PR1210 PR1510	WXH15 WHH15 WXM15	IC810 IC950 IC1008	F15M MK2000	PC6510	IN2004 IN2010 IN2510	
K20	GC1020	KC520M KC620M KC725M	ACK300 EH20Z ACX80 ACW30	VP15TF	GH130		WKK25	IC328 IC830 IC950 IC350 IC808 IC908 IC1008	F25M MK2000 MO3000	PC6510 PC5300	IN1030 IN2004 IN2010 IN2015 IN2030 IN2505	
K30	GC1020	KC620M KC725M	ACK300 ACZ50M					IC328 IC830 IC900 IC908 IC350 IC808 IC908	F30M F40M MP3000	PC5300 PC9570T	IN2005 IN2015 IN2030 IN2505	



Conversion table grades – milling

PVD milling grades

Material / Class	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Iscar	SECO	Korloy	Ingersoll Tague Tec
S Heat-resistant alloys	S05	YBG102								MH1000 F15M	PC8110	
	S10	YBG102 YBG202 YBG205	KC525M KC643M	ACZ20W	VP15TF		PR905 PRI210 PRI1510		IC808	NH1000 F15M F25M	PC5300	
	S20	YBG202 YBG205	KC525M KC643M	ACZ20W			PR905 PRI210 PRI1510		IC908 IC380 IC900 IC903 IC908 IC928 IC830 IC808	F25M F30M	PC5300 PC3545	IN2005 IN2505
	S30		KC725M KC735M	ACC50M				WSM35 WSM36 WSP45 WSP46 WXM35 WXP45	IC328 IC928 IC830	F40M	PC3545	IN1030 IN2030 IN2035 IN2530 IN4035
N Non-ferrous metals	N05		KC510M							MH1000 F15M		
	N10	YBG202	KC510M KC620M KC522M	EH20Z				WXN15		MH1000 F15M		
	N20		KC620M KC522M KC525M KC651M							F25M F30M F40M MP3000		
H Hardened materials	H05				VP05HT				IC903	MH1000 F15M	PC210F	IN2004 IN2006
	H10	YBG102	KC643M		VP10MF			WXH15 WHH15	IC900 IC808	MK2000 F30M MP3000	PC210F	IN2004 IN2005 IN2006
	H20	YBG202	GC1010 GC1025 GC1030		VP15TF				IC810 IC908	F30M F40M MK2000 MP3000		

Conversion table grades – milling

Uncoated milling grades

ISO	ZCC-CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Walter	Kyocera	Iscar	SECO	Korloy	Ingersoll Tague Tec
N	N01	H10	K115M K110M				WK10		IC20N		H01	IN04S
	N10		K313	EH520	HT10		WKM	GW25	IC08	H15	G10	IN10K IN05S
	N20	H13A H10F	KMF	EH520	TF15		KMG40		IC28	H25		IN15K
Non-ferrous metals												

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Examples of materials for machining groups

Material No.	Material	Machining group
1.0722	10SPb20	1
1.0715	9SMn28	1
1.0736	9SMn36	1
1.0718	9SMnPb28	1
1.0737	9SMnPb36	1
1.0401	C15	1
1.0402	C22	1
1.1141	Ck15	1
1.1170	28Mn6	2
1.0726	35S20	2 / 3
1.1167	36Mn5	2 / 3
1.1157	40Mn4	2 / 3
1.0501	C35	2 / 3
1.0503	C45	2 / 3
1.1191	Ck45	2 / 3
1.1183	Cf35	2 / 3
1.1213	Cf53	2 / 3
1.1545	C 105 W1	4 / 5
1.1663	C 125 W	4 / 5
1.0535	C55	4 / 5
1.0601	C60	4 / 5
1.1274	Ck101	4 / 5
1.1203	Ck55	4 / 5
1.1221	Ck60	4 / 5
1.5710	36NiCr6	5 / 9
1.5120	38MnSi 4	5 / 9
1.1545	C 105 W2	4 / 5
1.1663	C 125 W	4 / 5
1.0535	C65	4 / 5
1.0601	C70	4 / 5
1.1274	Ck101	4 / 5
1.1203	Ck55	4 / 5
1.1221	Ck60	4 / 5
1.5710	36NiCr7	5 / 9
1.5120	38MnSi 5	5 / 9
1.1545	C 105 W3	4 / 5
1.1663	C 125 W	4 / 5
1.0535	C75	4 / 5
1.0601	C80	4 / 5
1.1274	Ck101	4 / 5
1.1203	Ck55	4 / 5
1.1221	Ck60	4 / 5
1.5710	36NiCr8	5 / 9
1.5120	38MnSi 6	5 / 9
1.1545	C 105 W4	4 / 5
1.1663	C 125 W	4 / 5
1.0535	C85	4 / 5
1.0601	C90	4 / 5
1.1274	Ck101	4 / 5

Material No.	Material	Machining group
1.1203	Ck55	4 / 5
1.1221	Ck60	4 / 5
1.5710	36NiCr9	5 / 9
1.5120	38MnSi 7	5 / 9
1.1545	C 105 W5	4 / 5
1.1663	C 125 W	4 / 5
1.0535	C95	4 / 5
1.0601	C100	4 / 5
1.1274	Ck101	4 / 5
1.1203	Ck55	4 / 5
1.1221	Ck60	4 / 5
1.5710	36NiCr10	5 / 9
1.5120	38MnSi 8	5 / 9
1.5680	12Ni19	10 / 11
1.3255	S 18-1-2-5	10 / 11
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1.4034	X46Cr 13	12 / 13
1.4871	X53 CrMnNiN 21-9	12 / 13
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1.4001	X7Cr14	12 / 13
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1.4308	G-X6CrNi 18-9	14
1.4408	G-X6CrNiMo 18-10	14
1.4583	X6CrNiMoNb 18-12	14
1.4571	X6CrNiMoTi 17-12-2	14
1.4550	X6CrNiNb 18-10	14
1.4541	X14CrNiTi 18-10	14
1.4845	X12CrNi 25-21	14
1.4310	X10CrNi 18-8	14
1.4305	X10CrNiS 18-10	14
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1.4440	X2CrNiMo 18-16	14

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1.4429	X2CrNiMoN 17-13-3	14
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1.4301	X5CrNi 18-10	14
1.4401	X5CrNiMo 17-12-2	14
0.6010	GG10	16
0.6015	GG15	16
0.6020	GG20	16
0.6025	GG25	16 / 17
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0.6035	GG35	17
0.6040	GG40	17
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1.4828	X15CrNiSi20-12	17
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0.7040	GGG40	18
0.7043	GGG40.3	18
0.8135	GTS-35	18
0.7050	GGG50	19
0.7060	GGG60	19
0.7070	GGG70	19
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2.0240	CuZn15	28
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Test protocol

ZCC Cutting Tools Europe GmbH

Date:

General

End User

Distributor

Company

Contact person

Machine

Type

Producer

Power [kW]

Tooling system

Work piece

Material

Hardness/Tensile strength [N/mm²]

Heat treatment/Surface

Interrupt cutting

Cutting tools

Producer (holder)

Toolholder (name)

Teeth Z

Producer/Supplier

Insert type/Tool number

Grade

Solid carbide tools number

Cooling

Cutting Data

RPM n [U/min]

Cutting speed Vc [m/min]

Feed rate f [mm/rpm]

Feed rate Vf [mm/min]

Depth of cut a_p [mm]

Width of cut a_e [mm]

Machining length [mm]

Cutting time T [min]

Results

Machined pieces/Edges

Surface quality

Flankwear VB

Criteria

Notch wear

Crater wear

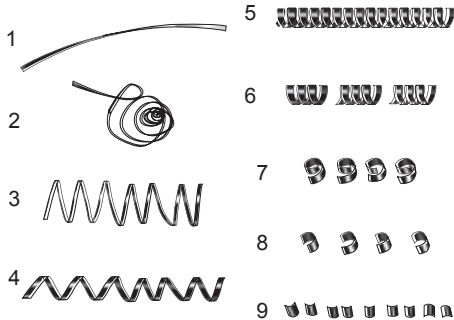
Plastic deformation

Built-up edge

Insert breakage

Cutting edge breakage

Chip forms



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Conclusion:

Fax: +49-(0)211-989240-111
E-mail: technik@zccct-europe.com

Signature:

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Torque [Nm]	0,2	0,3	0,4	0,7	0,8	1,5	2,3	3,4	5,0	6,7	11,4	19,2	27,0	55,8	85

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The Company

Zhuzhou Cemented Carbide Cutting Tools Co., Ltd. (ZCC-CT) is located in Zhuzhou, Hunan province, China and is the largest supplier of carbide tools into the Chinese market. The ZCC-CT cutting tool company is part of the "Zhuzhou cemented carbide Group" who manufacture carbide materials and powders. Both of these companies are part of the "Minmetals Corporation" who mine and produce raw tungsten carbide materials.

Since its foundation in 1953 ZCC-CT has developed rapidly by progressively using highly advanced modern production technology as well as having a highly qualified and committed workforce. With over 2,000 employees the company is now the largest producer of carbide cutting tools in China and one of the leading carbide manufacturers worldwide.

Using this advanced production technology, ZCC-CT products are manufactured to the highest quality standards to maintain a constant quality and high performance. The wide range of products contains indexable carbide inserts (coated and uncoated), inserts of Cermets, CBN, PCD and ceramics, solid carbide cutting tools as well as tool holders and milling bodies. The products are produced to various international standards such as ISO DIN, ANSI, JIS and BSI. Furthermore customised and special carbide product are also offered.

Research and development plays a major and significant role at ZCC-CT. The production facilities use the most sophisticated and advanced equipment available and this is supplied by the leading machine and equipment manufacturers in Germany and Switzerland. A highly qualified and skilled team of engineers in the R&D departments are constantly developing new and improved cutting tools. There is a constant desire to continually enhance the quality, to fulfill the ever increasing market requirements for new and initiative products and to achieve the best possible result for the customers.

The production and administration facilities in China are certified to ISO 9001:2000 and they maintain strict environmental management to ISO 14001:2004 standards.

Since 2003 ZCC Cutting Tools has operated a sales organisation in Europe. This sales and warehousing subsidiary of ZCC-CT is based in Düsseldorf (Germany) and has been progressively build up and expanded by Mr. Quanliang Zhao the European Managing Director.

Sales to all European countries, as well as Russia and Turkey, are controlled and managed from this European central warehouse in Düsseldorf, with the majority of the products being dispatched on the same day of ordering. The business operates under the quality management system for "Distribution and Logistics of Metal Cutting Tools" and is certified with DIN EN ISO 9001:2008.

ZCC Cutting Tools Europe has a constantly growing number of employees covering sales, marketing, warehouse and distribution, technical support, IT, HR and accounting. Our external sales team and our partners from around Europe are there to support you on-site in your production facilities or distribution operations. Our internal, highly qualified, technical application engineering staff are always available to give the customer technical advice and support via telephone, by email or in person. The internal sales team takes care of your enquiries and orders and together with dedicated warehouse staff they ensure that products are dispatched to you as quickly as possible.

The complete team at ZCC Cutting Tools Europe are there to support you and be your competent and efficient partner in the global Cutting Tool Industry.



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