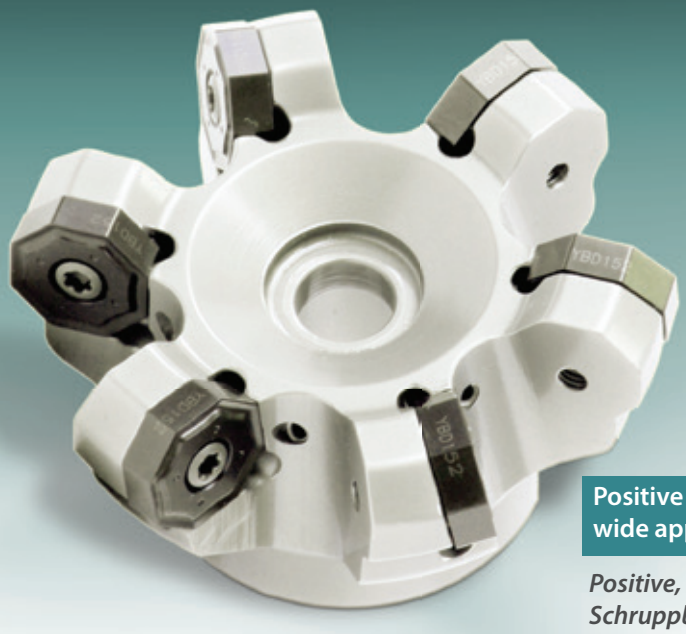
High performance cutters
Hochleistungsfräser

with double sided insert / mit doppelseitiger WSP

FMA07, FMA11, FMA12
FMD02, EMP13

ZCC Cutting Tools Europe GmbH

your Partner \ your Value



FMA07

Stable double sided insert with 16 cutting edges for high productivity.

Stabile doppelseitige Wendeschneidplatte mit 16 Schneidecken für hohe Wirtschaftlichkeit.

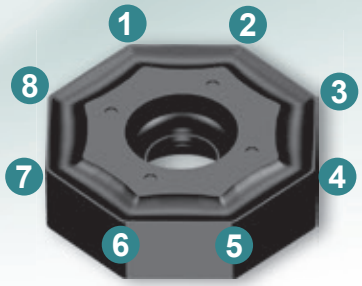
Positive light cutting chip breaker for finishing to roughing in a wide application field.

Positive, leicht schneidende Spanbrecherform für die Schlicht- bis Schruppbearbeitung mit weitem Anwendungsspektrum.

Cutter body diameter Ø25 to Ø315, inserts ONHU06 and ONHU08**, grades:**

*Fräserdurchmesser Ø25 bis Ø315, WSP ONHU06** und ONHU08**, in den Sorten:*

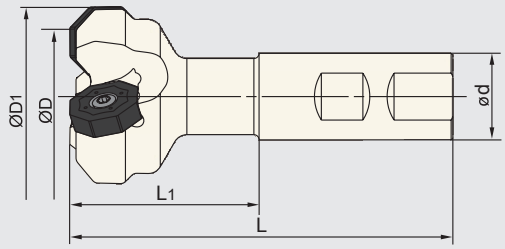
YBC302	YBG202	YBM253	YBM351	YBG205	YBD152
CVD P15 - P35	*PVD P10 - P30*	*CVD P20 - P40*	*CVD P25 - P40*	*PVD P10 - P30 M20 - M30*	*CVD K05 - K25*



Face milling / Planfräser

Kr:45°

FMA07 P K

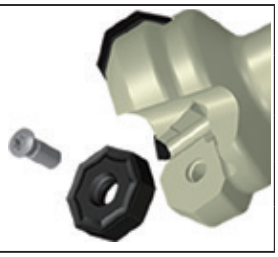


Type Typ		✻	Stock Lager R	Stock Lager L	Dimension Abmessung (mm) ØD	ØD1	ød	L	L1	apmax	Tooth Zähne Z	Weight Gewicht (kg)
FMA07	**-025-XP20-ON06-02**		●	○	25	37	20	95	45	4	2	0.2
	-025-XP20-ON06-02C	✻	●	○	25	37	20	95	45	4	2	0.2
	-032-XP25-ON06-02C	✻	●	○	32	44	25	111	55	4	2	0.4
	-040-XP25-ON06-03		●	○	40	52	25	106	50	4	3	0.4
	-032-XP25-ON08-02		●	○	32	47	25	111	55	5	2	0.4
	-032-XP25-ON08-02C	✻	●	○	32	47	25	111	55	5	2	0.4
	-040-XP25-ON08-03		●	○	40	55	25	111	55	5	3	0.5
	-040-XP25-ON08-03C	✻	○	○	40	55	25	111	55	5	3	0.5
	-050-XP25-ON08-04		●	○	50	65	25	111	55	5	4	0.6

● Ex stock / ab Lager ○ On demand / auf Anfrage ✻ With internal cooling · Mit Innenkühlung

Spare Parts · Ersatzteile

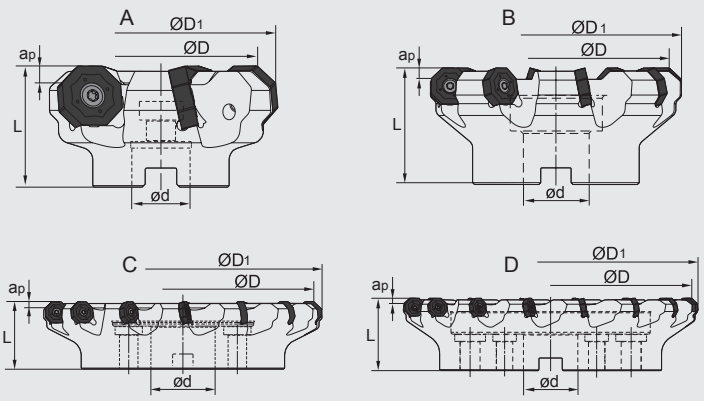
Diameter Durchmesser ØD	Insert WSP	Screw Schraube	Wrench Schlüssel	
Ø25 -Ø40	ONHU06**-PF/PM/W	I60M4×10	--	WT15IS
Ø32 -Ø50	ONHU08**-PF/PM/W	I60M5×13	WT20IT	--



Face milling / *Planfräser*

Kr:45°

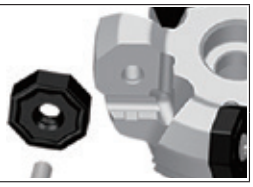
FMA07 P M K



Type *Typ*		✻	Stock *Lager* R	Stock *Lager* L	Dimension *Abmessung (mm)* ØD	ØD1	ød	L	apmax	Tooth *Zähne* Z	Coupling *Aufnahme*	Weight *Gewicht* (kg)
FMA07	**-050-A22-ON06-05**		●	○	50	62	22	40	4	5	A	0.3
	-050-A22-ON06-05C	✻	●	○	50	62	22	40	4	5	A	0.3
	-063-A22-ON06-06		●	○	63	75	22	40	4	6	A	0.5
	-063-A22-ON06-06C	✻	●	○	63	75	22	40	4	6	A	0.5
	-080-A27-ON06-07C	✻	●	○	80	92	27	50	4	7	A	1.0
	-080-B27-ON06-07		●	○	80	92	27	50	4	7	B	1.0
	-080-B27-ON06-07C	✻	●	○	80	92	27	50	4	7	B	1.0
	-100-B32-ON06-08		●	○	100	112	32	63	4	8	B	1.9
	-100-B32-ON06-08C	✻	●	○	100	112	32	63	4	8	B	1.9
	-125-B40-ON06-09		●	○	125	137	40	63	4	9	B	3.5
	-125-B40-ON06-09C	✻	●	○	125	137	40	63	4	9	B	3.5
	-160-C40-ON06-11		●	○	160	172	40	63	4	11	C	4.3
	-200-C60-ON06-13		○	○	200	212	60	63	4	13	C	6.4
	-250-C60-ON06-15		○	○	250	262	60	63	4	15	C	13.4
	-315-D60-ON06-17		○	○	315	327	60	80	4	17	D	21.9
	-063-A22-ON08-05		●	○	63	78	22	40	5	5	A	0.5
	-063-A22-ON08-05C	✻	●	○	63	78	22	40	5	5	A	0.5
	-080-A27-ON08-06C	✻	○	○	80	95	27	50	5	6	A	0.9
	-080-B27-ON08-06		●	○	80	95	27	50	5	6	B	0.9
	-080-B27-ON08-06C	✻	○	○	80	95	27	50	5	6	B	0.9
	-100-B32-ON08-07		●	○	100	115	32	63	5	7	B	1.8
	-100-B32-ON08-07C	✻	●	○	100	115	32	63	5	8	B	3.1
	-125-B40-ON08-08		●	○	125	140	40	63	5	8	B	3.1
	-125-B40-ON08-08C	✻	●	○	125	140	40	63	5	8	B	3.1
	-160-C40-ON08-10		●	○	160	175	40	63	5	10	C	4.1
	-200-C60-ON08-12		●	○	200	215	60	63	5	12	C	6.1
	-250-C60-ON08-14		●	○	250	265	60	63	5	14	C	12.0
	-315-D60-ON08-16		○	○	315	330	60	80	5	16	D	21.0

Spare Parts · Ersatzteile

Diameter Durchmesser ØD	Insert WSP	Screw Schraube	Wrench Schlüssel	
Ø50 -Ø315	ONHU06**-PF/PM/W	I60M4×10	--	WT15IS
Ø63 -Ø315	ONHU08**-PF/PM/W	I60M5×13	WT20IT	--



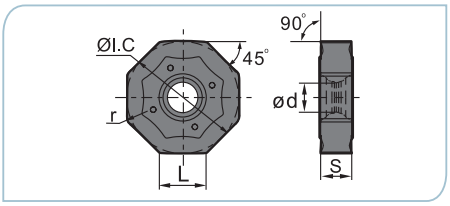
Coupling Aufnahme	Diameter Durchmesser Ø D	Screw·Schraube	Ring·Dichtring
B27	Ø80	LDB27C	B27-002-CP
B32	Ø100	LDB32C	B32-002-CP
B40	Ø125	LDB40C	B40-002-CP

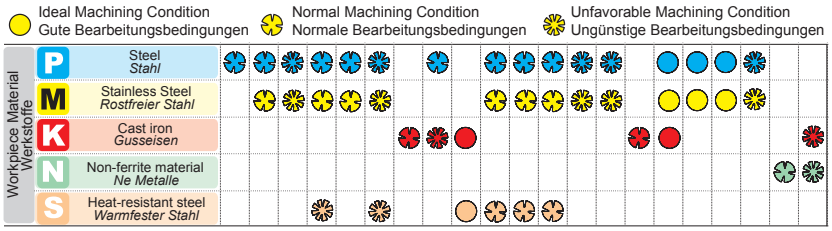
● Ex Stock / *ab Lager* ○ On demand / *auf Anfrage* ✻ With internal cooling · *Mit Innenkühlung*

B

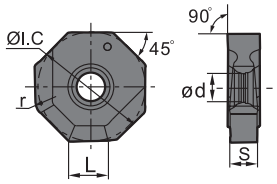
Milling Tools
Fräser

Applicable inserts
Wendeschneidplatten





Insert WSP	Type Typ	Dimension Abmessung (mm)					CVD Coating CVD Beschlicht.							PVD Coating PVD Beschicht.							Cermet Cermet		Carbide uncoat. unb.Hartmetall		
		L	ØI.C	S	ød	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	ONHU060408-PF	6.58	15.875	4.76	4.4	0.83	●			●			○					●								
	ONHU08T508-PF	8.39	20.2	5.79	5.3	0.83	●			●			●					●								
	ONHU060408-PM	6.58	15.875	4.76	4.4	0.83	●			●		●	●					○								
	ONHU08T508-PM	8.39	20.2	5.79	5.3	0.83	●			●		●	●													
	ONHU08T508-W	6.9	20.5	6.00	5.3	0.80							●		○											



● Ex Stock / ab Lager ○ On demand / auf Anfrage

Cutting Data / Schnittdaten

Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				V_c(m/min)	f_z(mm/z)	a_p(mm)	
						ONHU06**-PM	ONHU08**-PM
P	Low-carbon steel Soft steel Niedriglegierter Kohlenstoffstahl Baustahl	≤180	YBC302 YBG202 YBM253 YBM351	270 (220-350)	0.2 (0.1-0.4)	4	5
P	High-carbon steel Alloy steel Hochleg. Kohlenstoffstahl Leg. Stahl	180-280	YBC302	240 (200-320)	0.2 (0.1-0.4)	4	5
P			YBG202	240 (180-350)	0.2 (0.1-0.4)	4	5
P			YBM253	260 (200-320)	0.2 (0.1-0.4)	4	5
P			YBM351	200 (180-280)	0.2 (0.1-0.4)	4	5
P	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM253	240 (180-300)	0.2 (0.1-0.4)	4	5
P			YBM351	180 (150-250)	0.2 (0.1-0.4)	4	5
M	Stainless steel Rostfreier Stahl	≤270	YBM253	230(180-300)	0.2(0.1-0.3)	4	5
K	Cast iron Gusseisen	180-250	YBD152	270 (150-300)	0.4 (0.1-0.5)	4	5

For Example / Beispiele

Milling Tools / *Fräser:* FMA07-100-B32-ON08-07
Insert / *WSP:* ONHU08T508-PM YBD152
Parts / *Teile:* Case of gear pump / *Pumpengehäuse*
Workpiece material / *Werkstückstoff:* HT400
Cooling system / *Kühlsystem:* dry cutting / *trocken*

Machine / *Maschine:* CNC floor Type / *CNC Maschine*

Cutting data / *Schnittdaten:* V_c=267m/min f_z=0.42mm/z
a_p=1.5mm a_e=80mm

Direction / *Richtung* Climb milling / *Gleichlauffräsen*
Processing site / *Bearbeitungsebene* End face / *Planfläche*

● Wear comparison of insert
Verschleißvergleich der WSP

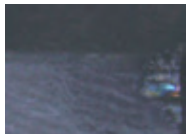
tool wear / Verschleiß

ZCC·CT

Competitor / Wettbewerb A

flank wear / Freiflächenverschleiß

ZCC·CT


Competitor / Wettbewerb A

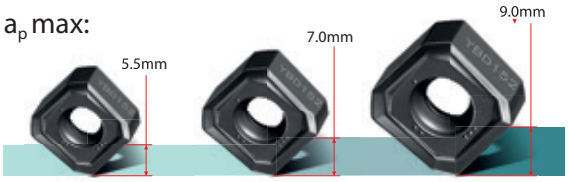
FMA11 Kr: 45°

New generation of face milling with double sided inserts
Neue Planfräsergeneration mit doppelseitiger WSP

Double sided inserts
Doppelseitige WSP

Maximum cutting depth:
Maximale Schnitttiefe:

a_p max:



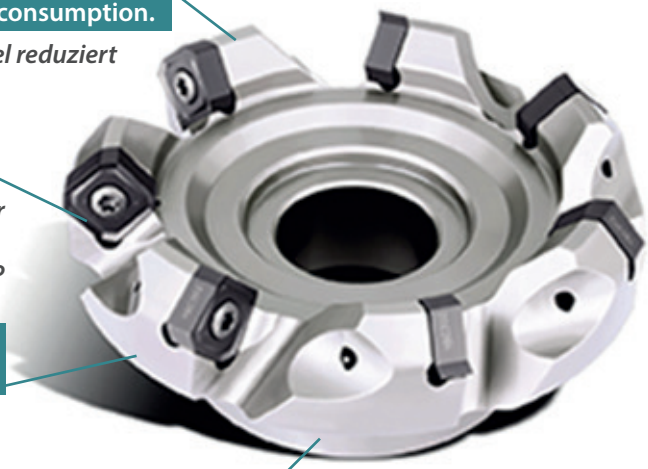
New SNEG1506ANR-E

YBG205

- For machining of stainless steel
- Für die Bearbeitung von rostfreiem Stahl

Inserts with large rake angles, reducing power consumption.
Großer Spanwinkel reduziert Schnittkräfte.

8 cutting edges
8 Schneidkanten für wirtschaftliche Auslastung der WSP



Milling cutter with thicker inserts for high stability and deeper cutting depth.
Doppelseitige, extra dicke Wendeschneidplatte für große Spantiefen bei hoher Bruchsicherheit.

Inserts with wiper cutting edge for good surface quality.
Wiper-Geometrie für beste Oberflächengüte.

Insert grades:
WSP Sorten:

YBC302	YBM253	YBD152	YBG205	YB9320
CVD P15 - P35	*CVD P20 - P40*	*CVD K05 - K25*	*PVD P15 - P25 M20 - M30*	*PVD P15 - P25 M20 - M30*

Comparison of wear
Vergleich

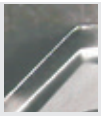
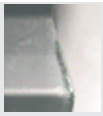
Workpiece material: GG30 Grey cast iron
Werkstück-Material: GG30 Grauguss

Machining: Face milling
Bearbeitung: Planfräsen

Tool / *Werkzeug:* FMA11-125-B40-SN12-08

Inserts / *WSP:* SNEG1205ANR-GM/YBD152

Cutting data: Vc=300m/min fz=0.3 mm/z
Schnittdaten: ap=3mm ae=80mm

	Major cutting edge *Hauptschneidkante*	Minor Cutting edge *Nebenschneidkante*	Wiper
FMA11 After 3 Workpieces of machining *Nach 3 bearbeiteten Werkstücken*			
Competitor / *Wettbewerb* After 2 Workpieces of machining *Nach 3 Bearbeiteten Werkstücken*			

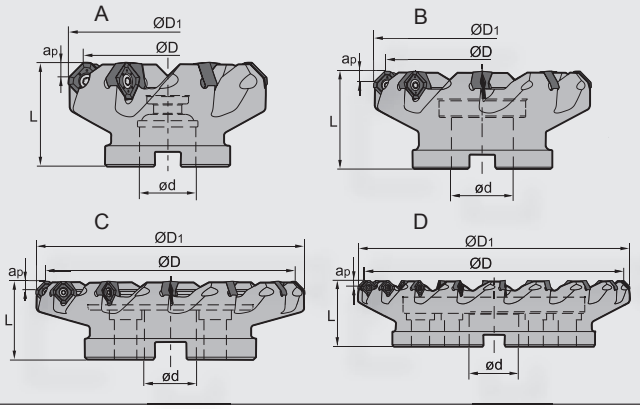
B

Milling Tools
Fräser

Face Milling Tools · Planfräser

Kr:45°

FMA11 P K



Specification of tools · Werkzeug Beschreibung

Type Typ		✻	Stock Lager R	Stock Lager L	Dimension (mm) Abmessung ØD	ØD1	Ød	L	apmax	No.of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMA11	-063-A22-SN12-05		●		63	74.47	22	40	5.5	5	A	0.55
	-063-A22-SN12-06		●		63	74.47	22	40	5.5	6	A	0.58
	-080-A22-SN12-08		○		80	74.47	22	40	5.5	6	A	1.10
	-080-A27-SN12-06		●		80	91.47	27	50	5.5	6	A	1.14
	-100-B32-SN12-07		●		100	111.47	32	50	5.5	7	B	1.42
	-100-B32-SN12-07C	✻	●		100	111.47	32	50	5.5	7	B	1.42
	-100-B32-SN12-10C		●		100	111.47	32	50	5.5	10	B	1.42
	-125-B40-SN12-08		●		125	136.47	40	63	5.5	8	B	2.86
	-125-B40-SN12-08C	✻	●		125	136.47	40	63	5.5	8	B	2.86
	-125-B40-SN12-12C	✻	●		125	136.47	40	63	5.5	12	B	2.86
	-160-C40-SN12-10		●		160	171.47	40	63	5.5	10	C	4.06
	-160-C40-SN12-15		●		160	171.47	40	63	5.5	15	C	4.06
	-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	7.0	5	A	0.56
	-080-A27-SN15-06		●		80	94.4	27	50	7.0	6	A	1.06
	-100-B32-SN15-07		●		100	114.4	32	50	7.0	7	B	1.47
	-100-B32-SN15-07C	✻	●		100	114.4	32	50	7.0	7	B	1.47
	-100-B32-SN15-09C	✻	●		100	114.4	32	50	7.0	9	B	1.47
	-125-B40-SN15-08		●		125	139.4	40	63	7.0	8	B	2.70
	-125-B40-SN15-08C	✻	●		125	139.4	40	63	7.0	8	B	2.70
	-125-B40-SN15-10C	✻	●		125	140.25	40	63	7.0	10	B	3.10
	-160-C40-SN15-10		●		160	174.4	40	63	7.0	10	C	3.92
	-160-C40-SN15-13		●		160	175.25	40	63	7.0	13	C	4.14
	-200-C60-SN15-12		●		200	214.4	60	63	7.0	12	C	5.46
	-250-C60-SN15-14		●		250	264.4	60	63	7.0	14	C	11.26
	-315-D60-SN15-18		○		315	329.4	60	80	7.0	18	D	20.00
FMA11	-125-B40-SN19-07		●		125	142.63	40	63	9.0	7	B	3.00
	-125-B40-SN19-07C	✻	●		125	142.63	40	63	9.0	7	B	3.00
	-160-C40-SN19-09		●		160	167.63	40	63	9.0	9	C	4.25
	-200-C60-SN19-11		●		200	217.63	60	63	9.0	11	C	6.18
	-250-C60-SN19-13		●		250	267.63	60	63	9.0	13	C	11.55
	-315-D60-SN19-16		○		315	332.63	60	80	9.0	16	D	20.90

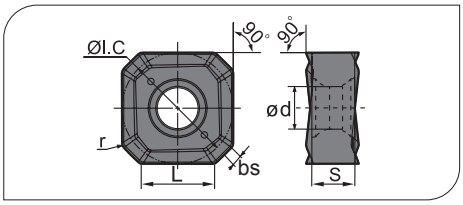
● Ex stock / ab Lager ○ On demand / auf Anfrage ✻ With internal cooling · Mit Innenkühlung

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Cassette Kassette	Locator screw Keilschraube	Wrench Schlüsse	
SN12 Ø63 - Ø200	SNEG1205ANR-GR	I60M3.5x10	--	WT15IS
SN15 Ø63 - Ø315	SNEG1506ANR-GR	I60M5x13	WT20IT	--
SN19 Ø125 - Ø315	SNEG1907ANR-GR	I43M6x16	WT25IT	--

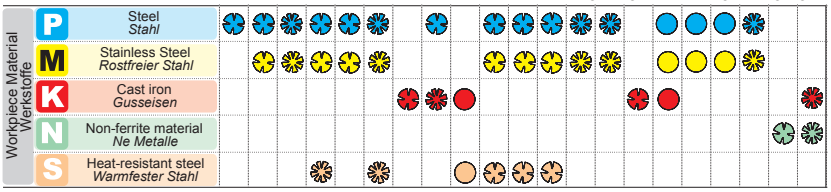
Coupling Aufnahme	Diameter Durchmesser Ø D	Screw·Schraube	Ring·Dichtring
B32	Ø100	LDB32C	B32-002-CP
B40	Ø125	LDB40C	B40-002-CP

Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material Werkstoffe

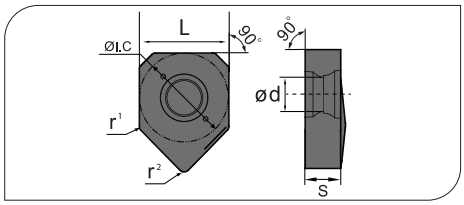


Insert shape Plattenform	Type Typ	Dimension (mm) Abmessung L	I.C	S	bs	Ø d	r	CVD Coating CVD Beschicht. YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	PVD Coating PVD Beschicht. YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	Cermet Cermet YNG151	YNG151C	Carbide uncoat. unbe. Hartmetall YC30S	YD101	YD201
	SNEG1205ANR-GM	7.6	12.0	4.76	1.05	4.6	0.8	●			●			●			●											
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9	●			●			●														
	SNEG1205ANR-GR	7.6	12.0	4.76	1.05	4.6	0.8	●			●			●														
	SNEG1506ANR-GR	9.4	15.0	5.54	1.30	5.5	0.9	●			●			●														
	SNEG1907ANR-GR	12.1	19.0	7.0	1.67	7.2	1.0	●			●			●	●													
	SNEG1506ANR-E	9.4	15.0	5.6	1.30	5.5	0.9											●										

● Ex Stock / ab Lager ○ On demand / auf Anfrage

B

Applicable inserts · Wendeschneidplatten



Insert shape Plattenform	Type Typ	Dimension (mm) Abmessung						CVD Coating CVD Beschicht.							PVD Coating PVD Beschicht.							Cermet Cermet		Carbide uncoat. unbe. Hartmetall		
		L	I.C	S	r^1	Ø d	r^2	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	SNEG1205ANR-W	12	12	4.76	0.6	4.6	0.8											●										

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data Schnittdaten		
				V (m/min)	f (mm/z)	a_{pmax}
P	Low-carbon steel Soft steel Niedriglegierter Kohlenstoffstahl Baustahl	≤180	YBM253	270 (220-350)	0.2 (0.1-0.4)	5.5-9.0
			YBC302	270 (220-350)	0.2 (0.1-0.4)	5.5-9.0
	High-carbon steel Alloy steel Hochleg. Kohlenstoffstahl	180-280	YBM253 YB9320	260 (200-320)	0.2 (0.1-0.4)	5.5-9.0
			YBC302	260 (200-320)	0.2 (0.1-0.4)	5.5-9.0
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM253 YB9320	240 (180-300)	0.2 (0.1-0.4)	5.5-9.0
			YBC302	240 (180-300)	0.2 (0.1-0.4)	5.5-9.0
M	Stainless stell Rostfreier Stahl	≤270	YBG205	180 (110-260)	0.2 (0.1-0.4)	5.5-9.0
K	Cast iron Gusseisen	180-250	YBD152	270 (150-300)	0.4 (01.-0.5)	5.5-9.0

Mounting double sided inserts:

Montage von doppelseitigen Wendeschneidplatten bei Fräsern:

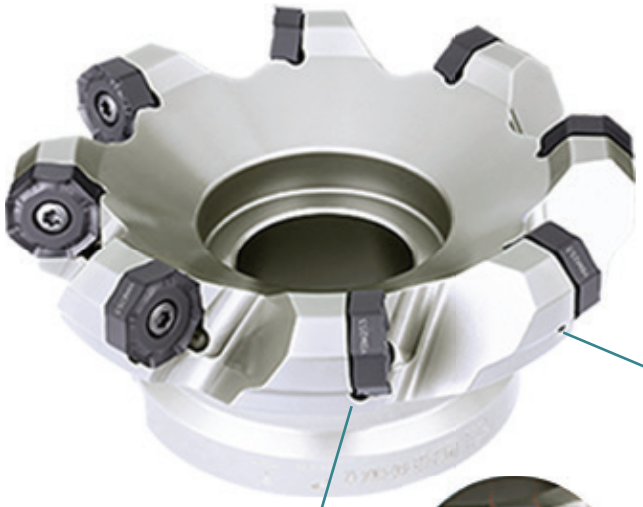
Please make sure that the faces with same marks are in the same direction.

Bitte stellen Sie sicher, dass die Platten mit gleicher Markierung in dieselbe Richtung angebracht werden.

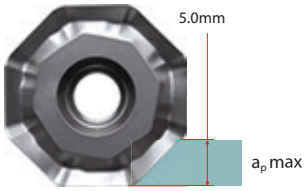
FMA12 Kr:45°

High Performance Face Mill with 16 edges for outstanding economy

Hochleistungs-Planfräser mit 16 Schneidkanten für hervorragende Wirtschaftlichkeit



Maximum cutting depth:
Maximale Schnitttiefe:



ONHU08T624R-GM

Economy:
Wirtschaftlichkeit:

8x2=16 edges

Double negative rake angle, in combination with helical insert structure, achieves double positive axial angle, which will help reduce cutting resistance and improve chip evacuation.

Doppelt negative Spanwinkel in Kombination mit einer spiralförmigen Struktur führen zu doppelt positiven Achswinkeln, die zu einer Reduzierung des Schneidwiderstandes führen und die Spanabfuhr verbessern.

Unique 3-dimentional edge

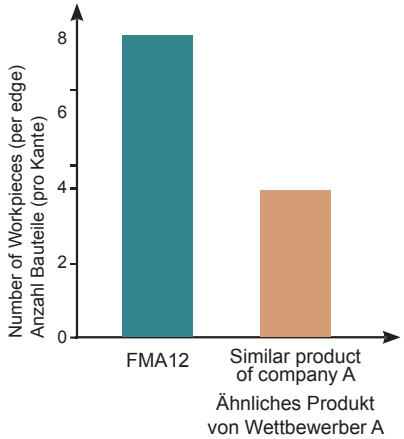
Einzigartige, dreidimensionale Schneidkante

Smooth cut due to positive and sharp cutting edge.

Weicher Schnitt durch positive und scharfe Schneidkantenausführung.

Comparing of wear

Vergleich



Example

Beispiel

Workpiece : Cylinder
Werkstück: *Zylinder*

Werkstück Material: HB250 Gray cast iron
Workpiece Material: *HB250 Grauguss*

Machining: Face milling
Bearbeitung: *Planfräsen*

Tool / *Werkzeug:* FMA12-160-C40-ON08-10

Inserts / *WSP:* ONHU08T624R-GM/YBD152

Cutting data / *Schnittdaten:* Vc=150m/min fz=0.25 mm/z
ap=3mm ae=160mm

Cooling: External
Kühlung: Außen

Insert grades:
WSP Sorten:

YBM253	YBG205	YBD152
CVD	*PVD*	*CVD*
P20 - P40	*P10 - P30*	*K05 - K25*
M10 - M30	*M10 - M30*	

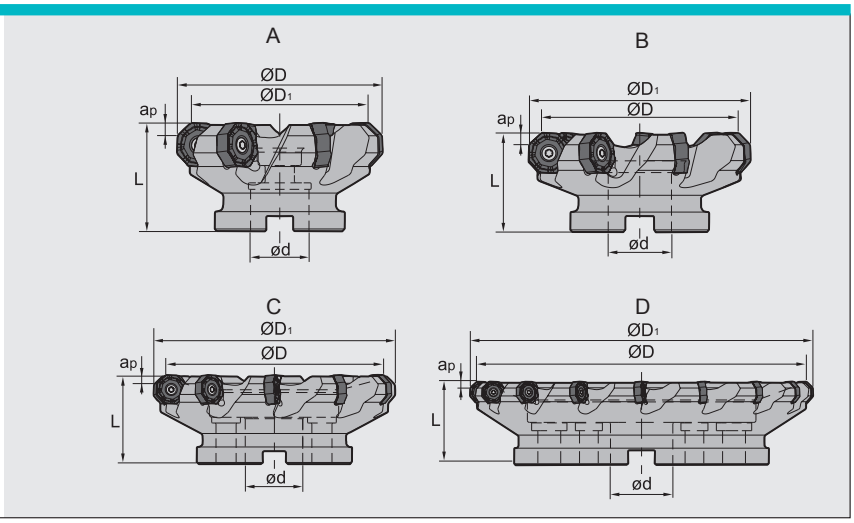
B

Milling Tools
Fräser

Face Milling Tools · Planfräser

Kr:45°

FMA12 P K M



Specification of tools · Werkzeug Beschreibung

Type Typ		✻	Stock Lager R	Stock Lager L	Dimension (mm) Abmessung ØD	ØD1	Ød	L	apmax	No.of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMA12	-063-A22-ON08-05		●		63	78	22	50	50	5	A	0,6
	-080-A27-ON08 -06		●		80	95	27	50	5.0	6	A	0.97
	-100-B32-ON08 -07		●		100	115	32	50	5.0	7	B	1.28
	-100-B32-ON08 -07C	✻	●		100	115	32	50	5.0	7	B	1.28
	-125-B40-ON08-08		●		125	140	40	63	5.0	8	B	2.59
	-125-B40-ON08-08C	✻	●		125	140	40	63	5.0	8	B	2.59
	-160-C40-ON08-10		●		160	175	40	63	5.0	10	C	4.10
	-200-C60-ON08-12		○		200	215	60	63	5.0	12	C	5.68
	-250-C60-ON08-14		○		250	265	60	63	5.0	14	C	11.90
	-315-D60-ON08-18		○		315	330	60	80	5.0	18	D	20.41

● Ex stock / ab Lager ○ On demand / auf Anfrage ✻ With internal cooling · Mit Innenkühlung

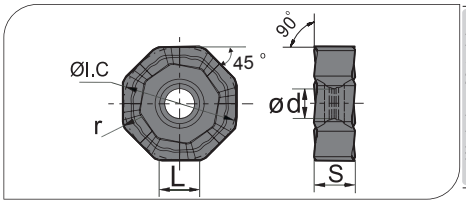
Spare Parts · Ersatzteile

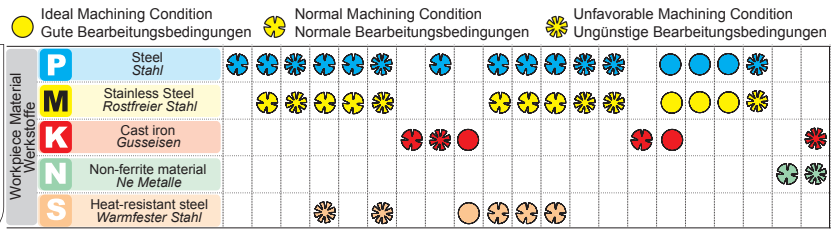
Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Drehmoment Torque	Wrench Schlüssel
Ø80-Ø315	ONHU08T624R-GM	I60M5X13	5 Nm	WT20IT

We recommend to use torque wrenches · Wir empfehlen den Einsatz von Drehmomentschlüsseln

Coupling Aufnahme	Diameter Durchmesser Ø D	Screw·Schraube	Ring·Dichtring
B32	Ø100	LDB32C	B32-002-CP
B40	Ø125	LDB40C	B40-002-CP

Applicable inserts · Wendeschneidplatten





Insert shape Plattenform	Type Typ	Dimension (mm) Abmessung						CVD Coating CVD Beschicht.								PVD Coating PVD Beschicht.								Cermet Cermet		Carbide uncoat. unbe. Hartmetall		
		L	I.C	S	bs	Ø d	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	ONHU08T624R-GM	6.38	20.2	6.3	5.3	2.4	0.8				●			●				●										

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data Schnittdaten		
				V (m/min)	f (mm/z)	apmax
P	Low-carbon steel Soft steel Niedriglegierter Kohlenstoffstahl	≤180	YBM253	270 (220-350)	0.2 (0.1-0.3)	5
			YBG205			
P	Alloy tool steel Leg. Werkzeugstahl	180-350	YBM253	240 (180-320)	0.15 (0.1-0.3)	5
			YBG205			
M	Stainless steel Rostfreier Stahl	≤270	YBM253	230 (180-300) 160 (110-270)	0.15 (0.1-0.3)	5
			YBG205			
K	Cast iron Gusseisen	180-250	YBD152	270 (150-300)	0.2 (01.-0.3)	5

● Ex Stock / ab Lager ○ On demand / auf Anfrage

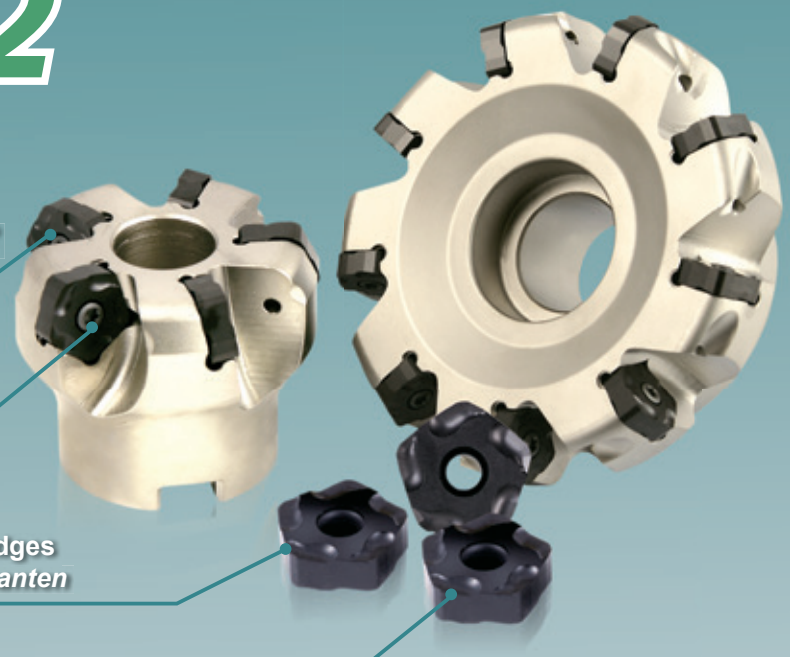
FMD02

Entering angle Kr=67°
Anstellwinkel Kr=67°

Screw clamping
Schraubenspannsystem

10 Cutting edges
10 Schneidkanten

Wiper / *Wiper*



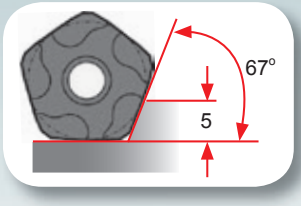
Clamping by wedge for highest accuracy and reliability.

Klemmkeilspannung für höchste Stabilität und Wiederholgenauigkeit.

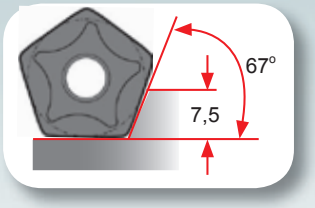
Insert grades:
WSP Sorten:

YBC302	YBM253	YBD152
CVD	*CVD*	*CVD*
P15 - P35	*P20 - P40*	*K05 - K25*

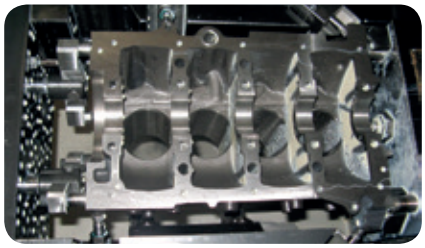
Machining of cast iron
Gussbearbeitung
$a_{p\ max}$=5 mm

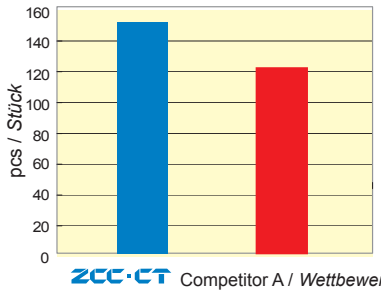


Steel, Alloy steel
Stahl, Legierter Stahl
$a_{p\ max}$=7.5 mm



Holder/ *Halter*	FMD02-100-B32-PN11-10 ZCC·CT	Competitor A / *Wettbewerb A*
Insert/ *WSP*	PNEG110512R-CR/YBD152	
Cutting data *Schnittdaten*	D=100 mm a_p=3~5 mm Vc=243 m/min f_z=0.15 mm/Z 145~155 pcs /*Stück*	D=100 mm a_p=3~5 mm Vc=243 m/min f_z=0.12 mm/Z 120~133 pcs /*Stück*





Comparison of wear / *Verschleißvergleich*

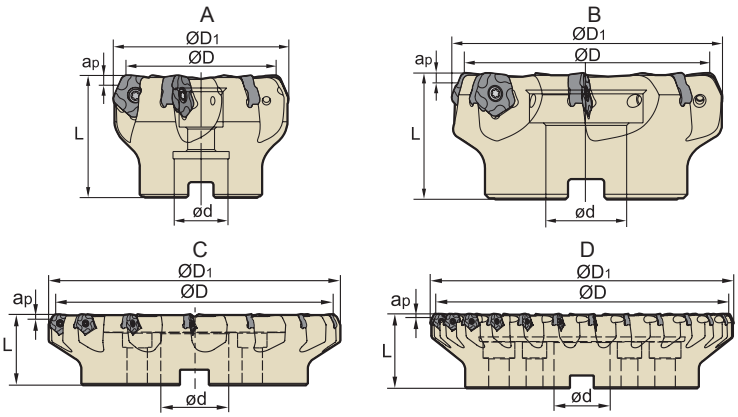
ZCC·CT after 80 min / *nach 80 min*

Competitor A / *Wettbewerber A* after 48 min / *nach 48 min*

Face milling / Planfräser

Kr:67°

FMD02 P K



Type Typ		✻	Stock Lager R	Stock Lager L	Dimension Abmessung (mm) ØD	ØD1	ød	L	apmax	Tooth Zähne Z	Coupling Aufnahme	Weight Gewicht (kg)
FMD02	-050-A22-PN11-04		●	●	50	60.1	22	50	5	4	A	0.6
	-050-A22-PN11-04C	✻	○	○	50	60.1	22	50	5	4	A	0.6
	-050-A22-PN11-05		●	○	50	60.1	22	50	5	5	A	0.6
	-050-A22-PN11-05C	✻	●	○	50	60.1	22	50	5	5	A	0.6
	-063-A22-PN11-05		●	○	63	73.1	22	50	5	5	A	0.8
	-063-A22-PN11-05C	✻	●	○	63	73.1	22	50	5	5	A	0.8
	-063-A22-PN11-06		●	○	63	73.1	22	50	5	6	A	0.9
	-063-A22-PN11-06C	✻	●	○	63	73.1	22	50	5	6	A	0.9
	-080-A27-PN11-06		●	○	80	90.1	27	50	5	6	A	1.1
	-080-A27-PN11-06C	✻	●	○	80	90.1	27	50	5	6	A	1.1
	-080-A27-PN11-08		●	○	80	90.1	27	50	5	8	A	1.2
	-080-A27-PN11-08C	✻	●	○	80	90.1	27	50	5	8	A	1.2
	-100-B32-PN11-07		●	○	100	110.1	32	50	5	7	B	1.8
	-100-B32-PN11-07C	✻	●	○	100	110.1	32	50	5	7	B	1.8
	-100-B32-PN11-10		●	○	100	110.1	32	50	5	10	B	1.9
	-100-B32-PN11-10C	✻	●	○	100	110.1	32	50	5	10	B	1.9
	-125-B40-PN11-08		●	○	125	135.1	40	63	5	8	B	2.9
	-125-B40-PN11-08C	✻	○	○	125	135.1	40	63	5	8	B	2.9
	-125-B40-PN11-12		●	○	125	135.1	40	63	5	12	B	3.2
	-125-B40-PN11-12C	✻	●	○	125	135.1	40	63	5	12	B	3.2
	-160-B40-PN11-10		●	○	160	170.1	40	63	5	10	B	5.6
	-160-B40-PN11-14		●	○	160	170.1	40	63	5	14	B	6.4
	-200-C60-PN11-12		○	○	200	210.1	60	63	5	12	C	7.9
	-200-C60-PN11-16		●	○	200	210.1	60	63	5	16	C	8.5
	-200-C60-PN11-20		○	○	200	210.1	60	63	5	20	C	8.5
	-200-C60-PN11-24		●	○	200	210.1	60	63	5	24	C	8.6
	-250-C60-PN11-14		○	○	250	260.1	60	63	5	14	C	13.4
	-250-C60-PN11-18		●	○	250	260.1	60	63	5	18	C	18.0
	-250-C60-PN11-30		○	○	250	260.1	60	63	5	30	C	13.5
	-315-D60-PN11-26		●	○	315	325.1	60	80	5	26	D	24.5

Spare Parts · Ersatzteile

ØD	Screw / Schraube	Wrench / Schlüssel
Ø50 -Ø315	I60M4×10	WT15IS

Coupling Aufnahme	Diameter Durchmesser Ø D	Screw·Schraube	Ring·Dichtring
B32	Ø100	LDB32C	B32-002-CP
B40	Ø125	LDB40C	B40-002-CP

● Ex Stock / ab Lager ○ On demand / auf Anfrage ✻ With internal cooling · Mit Innenkühlung

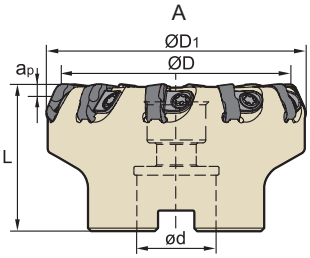
B

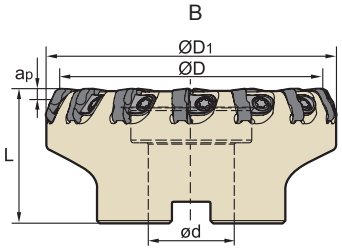
Milling Tools
Fräser

Face Milling Tools · Planfräser

Kr:67°

FMD02 P K





Type Typ		✻	Stock Lager R	Stock Lager L	Dimension Abmessung (mm) ØD	ØD1	ød	L	apmax	Tooth Zähne Z	Coupling Aufnahme	Weight Gewicht (kg)
FMD02	-080-A27-PN11-10		●	○	80	90.1	27	50	5	10	A	1.3
	-080-A27-PN11-10C	✻	○	○	80	90.1	27	50	5	10	A	1.3
	-100-B32-PN11-14		●	○	100	110.1	32	50	5	14	B	1.6
	-100-B32-PN11-14C	✻	●	○	100	110.1	32	50	5	14	B	1.6
	-125-B40-PN11-18		●	○	125	135.1	40	63	5	18	B	3.2
	-125-B40-PN11-18C	✻	○	○	125	135.1	40	63	5	18	B	3.2
	-160-B40-PN11-22		●	○	160	170.1	40	63	5	22	B	5.8
	-200-C60-PN11-28		●	○	200	210.1	60	63	5	28	C	8.5
	-200-C60-PN11-36		○	○	200	210.1	60	63	5	36	C	8.5

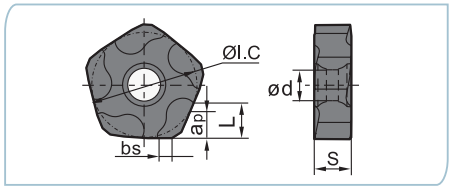
● Ex stock / ab Lager ○ On demand / auf Anfrage ✻ With internal cooling · Mit Innenkühlung

Spare Parts · Ersatzteile

ØD	Wedge / Keil	Screw / Schraube	Wrench / Schlüssel
Ø80 -Ø200	W18N	DM6×20A	WT15IT

Coupling Aufnahme	Diameter Durchmesser Ø D	Screw·Schraube	Ring·Dichtring
B32	-	LDB32C	B32-002-CP
B40	Ø125	LDB40C	B40-002-CP

Applicable inserts
Wendeschneidplatten



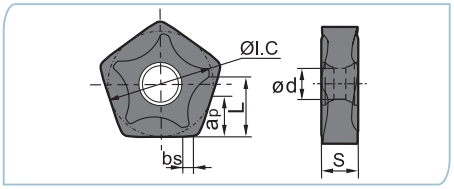
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel	Stahl
M	Stainless Steel	Rostfreier Stahl
K	Cast iron	Gusseisen
N	Non-ferrite material	Ne Metalle
S	Heat-resistant steel	Warmfester Stahl

WSP Insert	Typ Type	Dimension Abmessung (mm)						CVD Coating CVD Beschlicht.								PVD Coating PVD Beschicht.								Cermet Cermet		Carbide uncoat. unb.Hartmetall		
		L	ØI.C	S	ød	bs	$a_{p\,max}$	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5							●														
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5							○														
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5							●														
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5							○														
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5							●	●													
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5							●														

Applicable inserts
Wendeschneidplatten



Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel	Stahl
M	Stainless Steel	Rostfreier Stahl
K	Cast iron	Gusseisen
N	Non-ferrite material	Ne Metalle
S	Heat-resistant steel	Warmfester Stahl

WSP Insert	Typ Type	Dimension Abmessung (mm)						CVD Coating CVD Beschlicht.								PVD Coating PVD Beschicht.								Cermet Cermet		Carbide uncoat. unb.Hartmetall		
		L	ØI.C	S	ød	bs	$a_{p\,max}$	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.6	7.5	●			○																	
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.6	7.5	○																				
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.6	7.5	●			●																	
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.6	7.5	○			○																	
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.6	7.5	○			●																	
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.6	7.5	○			○																	

Cutting Data / Schnittdaten

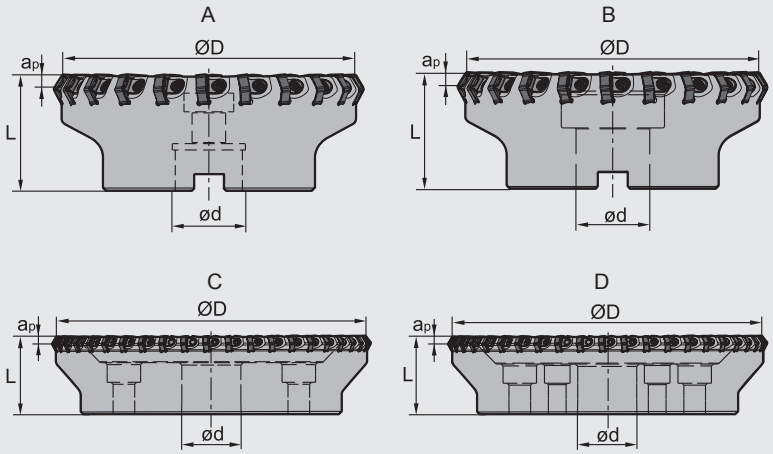
Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data / *Schnittdaten*				
				V_c(m/min)	f_z(mm/z)			a_{pmax}(mm)
					PF	PM	PR	
P	Low-carbon steel Soft steel Niedriglegierter Kohlenstoffstahl Baustahl	≤180	YBM253 YBC302	270 (220-350)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4	7.5
	High-carbon steel Alloy steel Hochleg. Kohlenstoffstahl	180-280	YBM253 YBC302	260 (200-320)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4	7.5
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM253 YBC302	240 (180-300)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4	7.5
K	Cast iron Gusseisen	180-250	YBD152	270 (150-300)	CF	CM	CR	5
					0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser

Kr:55°

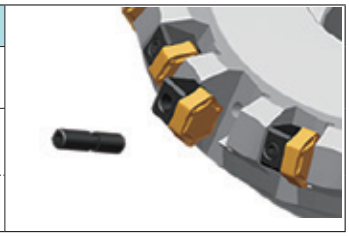
FMD02 K



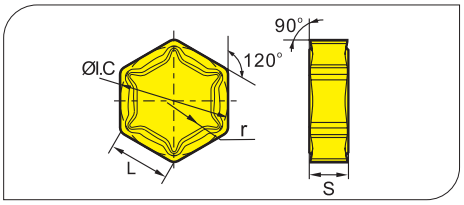
Specification of tools · Werkzeug Beschreibung

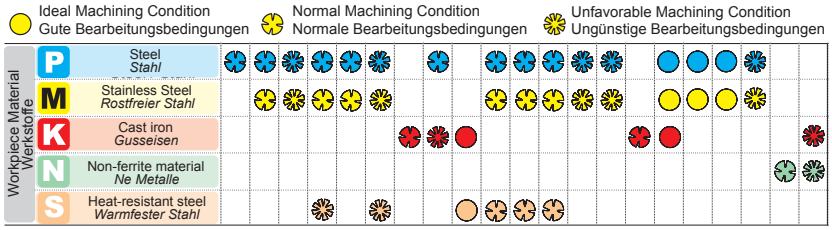
Type Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung ØD	ød	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMD02	-080-A27-HN09-08	○		80	27	50	6	8	A	1.19
	-080-A27-HN09-10	○	○	80	27	50	6	10	A	1.1
	-100-B32-HN09-10	○		100	32	50	6	10	B	1.77
	-100-B32-HN09-14	○	○	100	32	63	6	14	B	2.6
	-125-B40-HN09-14	○		125	40	63	6	14	B	3.55
	-125-B40-HN09-18	○	○	125	40	63	6	18	B	3.7
	-160-B40-HN09-18	○		160	40	63	6	18	B	5.62
	-160-B40-HN09-22	○	○	160	40	63	6	22	B	5.6
	-200-C60-HN09-22	○		200	60	63	6	22	C	6.7
	-200-C60-HN09-28	○	○	200	60	63	6	28	C	6.3
	-250-C60-HN09-28	○		250	60	63	6	28	C	13
	-250-C60-HN09-36	○	○	250	60	63	6	36	C	10.3
	-315-C60-HN09-32	○		315	60	63	6	32	C	21.7
	-315-C60-HN09-44	○		315	60	63	6	44	C	21.7
	-315-D60-HN09-44	○	○	315	60	63	6	44	D	21.7

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Wedge Keil	Wedge screw Keilschraube	Wrench Schlüssel	
Ø80-Ø315	W18N	DM6×20A	WT15IT	

Applicable inserts · Wendeschneidplatten





Plattenform Insert shape	Typ Type	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.								PVD Coating PVD Beschicht.								Cermet Cermet		Carbide uncoat. unbe. Hartmetall		
		L	I.C	S	r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG102	YB9320	YBG205	YBG202	YBG212	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	HNEX090512-DF	9.16	15.875	5.56	1.2							○														
	HNEX090512-DM	9.16	15.875	5.56	1.2							○	○													
	HNEX090512-DR	9.16	15.875	5.56	1.2							●	●													

Chipbreaker Selection FMD02 · Spanbrecher Auswahl FMD02

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
K	-DF	-DM	-DR

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data Schnittdaten			
				V (m/min)	f (mm/z)		
					-DF	-DM	-DR
K	Cast iron Gusseisen	180-250	YBD152	180 (110-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.5)
			YBD252	130 (110-200)	0.2(0.1-0.2)	0.25 (0.1-0.3)	0.3(0.2-0.5)

● Ex Stock / ab Lager ○ On demand / auf Anfrage

EMP13 Kr:90°

Achieving 90° with high quality Square Shoulder Milling Tools

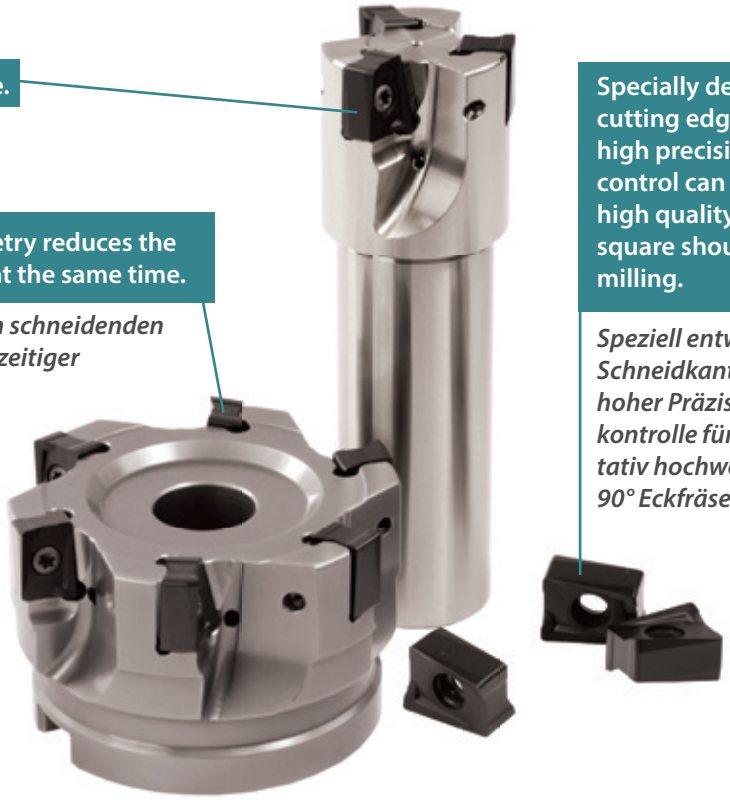
Erreichen Sie 90° mit der neuen Eckfräserserie

The PVD coating of the tools leads to a longer toollife.

Eine PVD-Beschichtung auf dem Fräser erzielt eine höhere Lebensdauer der Trägerwerkzeuge.

Extra thick inserts with a positive soft cutting geometry reduces the utting resistance and improves the wear resistance at the same time.

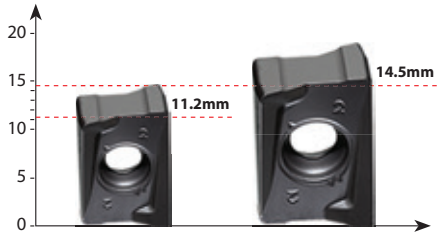
Extra dicke Wendeschneidplatte mit einer positiv weich schneidenden Geometrie reduziert den Schneidwiderstand bei gleichzeitiger Verbesserung der Bruchfestigkeit.



Specially designed cutting edges with high precision control can achieve high quality 90° square shoulder milling.

Speziell entwickelte Schneidkanten mit hoher Präzisions-kontrolle für qualitativ hochwertiges 90° Eckfräser.

Maximum cutting depth:
Maximale Schnitttiefe:

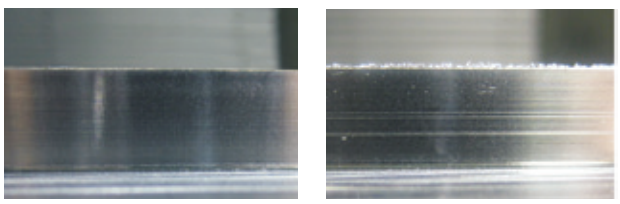


AN11 AN15

Insert grades: / ***WSP Sorten:***

YBC302	YBM253	YB9320	YBG205	YBD152	YBD252	YD101
CVD	*CVD*	*PVD*	*PVD*	*CVD*	*CVD*	-
K05-K25	*P20 - P40*	*P10 - P30*	*P10 - P30*	*K05-K25*	*K15-K35*	*K05-K25*
P20-P40	*M10 - M30*	*M20 - M30*	*M20 - M30*			

Comparison of surface quality:
Vergleich der Oberflächengüte:



EMP13 *Wettbewerber A*

Beispiel / Example:

Workpiece Material:	Mold Steel (HRC36)
Werkstück Material:	*Gesenkstahl (HRC36)*
Tool / *Werkzeug*:	EMP13-032-G32-AN15-02
Inserts / *WSP*:	ANGX150608PNR-GM/YBG205
Cutting data/ *Schnittdaten*:	Vc=220m/min, fz=0.1mm/z, ap=14.5mm, ae=10mm
Cutting condition:	Dry cutting
***Schnittbedingungen*:**	*Trocken*

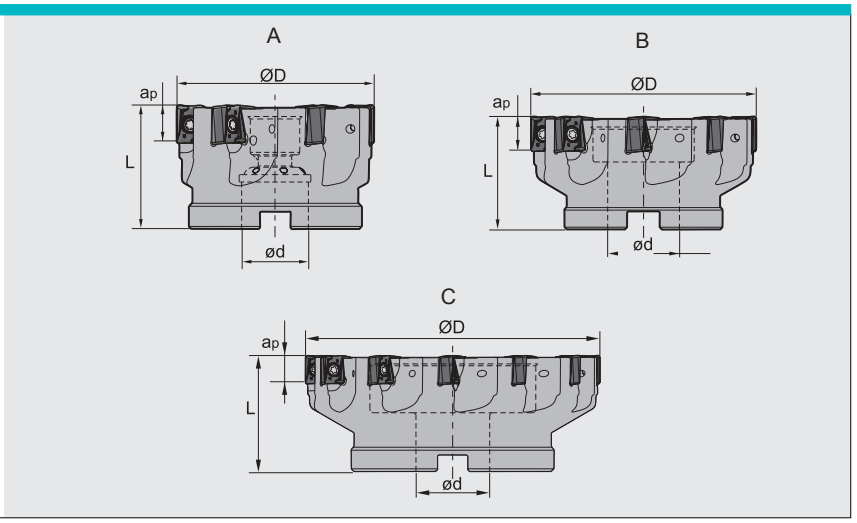
The component machined by using EMP13 shows better surface quality and verticality than the similar products from company A.

Das Werkstück, das mit EMP13 bearbeitet wurde, weist eine bessere Oberflächengüte und – Vertikalität auf als nach der Bearbeitung mit einem ähnlichen Produkt vom Wettbewerber.

Square Shoulder Milling Tools · *Eckfräser*

Kr:90°

EMP13 P K



Specification of tools · *Werkzeug Beschreibung*

Type *Typ*		✻	Stock *Lager* R	Stock *Lager* L	Dimension (mm) *Abmessung* ØD	Ød	L	$a_p$max	No.of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
EMP13	-050-A22-AN11-06	✻	●		50	22	40	11.2	6	A	0.30
	-063-A22-AN11-07	✻	●		63	22	40	11.2	7	A	0.49
	-080-A27-AN11-09	✻	●		80	27	50	11.2	9	A	1.18
	-100-B32-AN11-12		●		100	32	50	11.2	12	B	1.46
	-100-B32-AN11-12C	✻	○		100	32	50	11.2	12	B	1.46
	-125-B40-AN11-14		●		125	40	63	11.2	14	B	2.92
	-125-B40-AN11-14C	✻	○		125	40	63	11.2	14	B	2.92
	-160-C40-AN11-16		●		160	40	63	11.2	16	C	4.30
EMP13	-050-A22-AN15-04	✻	●		50	22	40	14.5	4	A	0.26
	-063-A22-AN15-05	✻	●		63	22	40	14.5	5	A	0.53
	-080-A27-AN15-06	✻	●		80	27	50	14.5	6	A	1.23
	-100-B32-AN15-08		○		100	32	50	14.5	8	B	1.52
	-100-B32-AN15-08C	✻	○		100	32	50	14.5	8	B	1.52
	-125-B40-AN15-10		●		125	40	63	14.5	10	B	3.05
	-125-B40-AN15-10C	✻	○		125	40	63	14.5	10	B	3.05
	-160-C40-AN15-12		●		160	40	63	14.5	12	C	4.46

✻ Internal coolant · *Innenkühlung*

● Ex stock / *ab Lager* ○ On demand / *auf Anfrage*

Spare Parts · *Ersatzteile*

Diameter *Durchmesser* Ø D	Insert *WSP*	Screw *Schraube*	Torque *Drehmoment*	Wrench *Schlüssel*
Ø50-Ø160	ANGX110504PNR-GM	I60M3X9	2 Nm	WT09IS
	ANGX110508PNR-GM			
Ø50-Ø160	ANGX150608PNR-GM	I60M4X12	3 Nm	WT15IS
	ANGX150616PNR-GM			

We recommend to use torque wrenches · *Wir empfehlen den Einsatz von Drehmomentschlüsseln*

Square Shoulder Milling Tools · *Eckfräser*

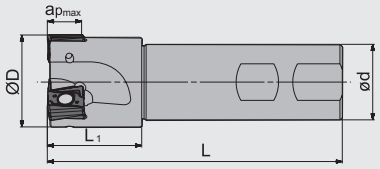
Kr:90°

EMP13 P K

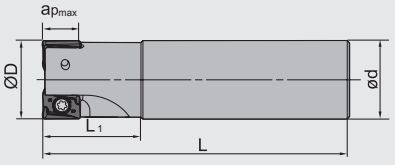
Weldon shank
Weldon-Schaft

Straight shank
Zylinder-Schaft

Weldon shank
Weldon-Schaft



Straight shank
Zylinder-Schaft



Specification of tools · *Werkzeug Beschreibung*

Type Typ		✻	Stock Lager R	Stock Lager L	Dimension (mm) Abmessung ØD	Ød	L	L_1	$a_p$max	No.of teeth Zähne	Weight Gewicht (kg)
EMP13 Weldon shank *Weldon-Schaft*	**-025-XP25-AN11-02**	✻	●		25	25	100	32	11.2	2	0.31
	-032-XP32-AN11-03	✻	●		32	32	115	40	11.2	3	0.61
	-040-XP32-AN11-04	✻	●		40	32	125	40	11.2	4	0.75
	-032-XP32-AN15-02	✻	●		32	32	125	40	11.2	2	0.66
	-040-XP32-AN15-03	✻	●		40	32	125	40	11.2	3	0.76
EMP13 Straight shank *Zylinder-Schaft*	**-025-G25-AN11-02**	✻	●		25	25	100	32	11.2	2	0.31
	-032-G32-AN11-03	✻	●		32	32	115	40	11.2	3	0.61
	-040-G32-AN11-04	✻	●		40	32	125	40	11.2	4	0.75
	-032-G32-AN15-02	✻	●		32	32	125	40	14.5	2	0.66
	-040-G32-AN15-03	✻	●		40	32	125	40	14.5	3	0.76

✻ Internal coolant · *Innenkühlung*

● Ex stock / *ab Lager* ○ On demand / *auf Anfrage*

Spare Parts · *Ersatzteile*

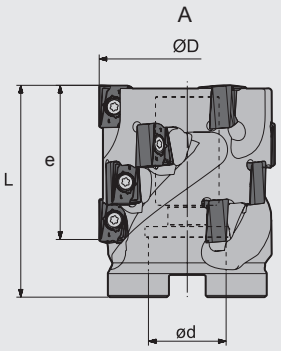
Diameter *Durchmesser* Ø D	Insert *WSP*	Screw *Schraube*	Torque *Drehmoment*	Wrench *Schlüssel*
Ø25-Ø40	**ANGX110504PNR-GM** **ANGX110508PNR-GM**	I60M3X9	2 Nm	WT09IS
Ø32-Ø40	**ANGX150608PNR-GM** **ANGX150616PNR-GM**	I60M4X12	3 Nm	WT15IS

We recommend to use torque wrenches · *Wir empfehlen den Einsatz von Drehmomentschlüsseln*

Square Shoulder Milling Tools · *Eckfräser*

Kr:90°

EMP13 P K



Specification of tools · *Werkzeug Beschreibung*

Type *Typ*		Stock *Lager*		Dimension (mm) *Abmessung*				No.of teeth *Zähne*	No.of inserts *Plattenanzahl*	Coupling *Aufnahme*	Weight *Gewicht* (kg)
		R	L	ØD	Ød	L	e				
EMP13	**-050X43-A22-AN11-03**	○		50	22	60	43	3	12	A	0.52
	-063X64-A27-AN11-04	○		63	27	80	64	4	24	A	1.15
	-063X53-A27-AN15-03	○		63	27	75	53	3	12	A	1.14
	-080X53-A32-AN15-04	○		80	32	75	53	4	16	A	1.82

● Ex stock / *ab Lager* ○ On demand / auf Anfrage

Spare Parts · *Ersatzteile*

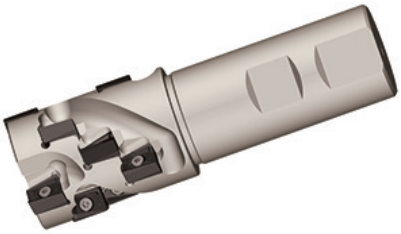
Diameter *Durchmesser* Ø D	Insert *WSP*	Screw *Schraube*	Torque *Drehmoment*	Wrench *Schlüssel*
Ø50-Ø63	**ANGX110504PNR-GM**	I60M3X9	2 Nm	WT09IS
Ø63-Ø80	**ANGX150608PNR-GM**	I60M4X12	3 Nm	WT15IS

We recommend to use torque wrenches · *Wir empfehlen den Einsatz von Drehmomentschlüsseln*

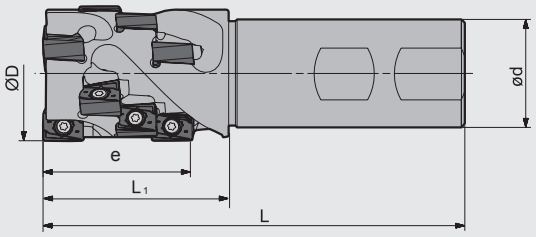
Square Shoulder Milling Tools · *Eckfräser*

Kr:90°

EMP13 P K



Weldon shank
Weldon-Schaft



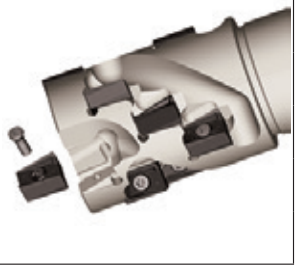
Specification of tools · *Werkzeug Beschreibung*

Type *Typ*		Stock *Lager*		Dimension (mm) *Abmessung*					No.of teeth *Zähne*	No.of inserts *Plattenanzahl*	Weight *Gewicht* (kg)
		R	L	ØD	Ød	L	L_1	e			
EMP13	-032X43-XP32-AN11-02	○		32	32	115	48	43	2	8	0.61
	-040X43-XP32-AN11-03	○		40	32	125	55	43	3	12	0.79
	-040X40-XP32-AN15-02	○		40	32	115	55	40	2	6	0.79
	-050X53-XP40-AN15-02	○		50	40	145	70	53	2	8	1.53

● Ex stock / *ab Lager* ○ On demand / *auf Anfrage*

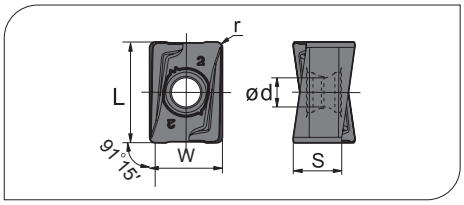
Spare Parts · *Ersatzteile*

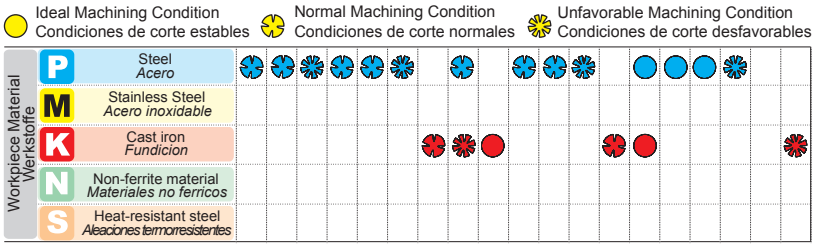
Diameter *Durchmesser* Ø D	Insert *WSP*	Screw *Schraube*	Torque *Drehmoment*	Wrench Schlüssel
Ø32-Ø40	**ANGX110504PNR-GM**	I60M3X9	2 Nm	WT09IS
Ø40-Ø50	**ANGX150608PNR-GM**	I60M4X12	3 Nm	WT15IS



We recommend to use torque wrenches · *Wir empfehlen den Einsatz von Drehmomentschlüsseln*

Applicable inserts · *Wendeschneidplatten*





Insert shape *Plattenform*	Type *Typ*	Dimension (mm) *Abmessung*					CVD Coating *CVD Beschicht.*								PVD Coating *PVD Beschicht.*						Cermet *Cermet*		Carbide uncoat. *unbe. Hartmetall*		
		L	W	S	Ø d	r	YBC301	YBC302	YBC401	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD101	YD201
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.8					●		●				●								
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.4					●		●				●								
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8					●		●				●								
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6					●		●				●								

Recommended cutting data · *Empfohlene Schnittdaten*

Workpiece material *Werkstückstoff*		Hardness HB *Härte*	Grade *Sorte*	Cutting data *Schnittdaten*		
				V (m/min)	f (mm/z)	apmax
P	Low-carbon steel Soft steel *Niedriglegierter Kohlenstoffstahl*	≤180	YBM253	270 (220-350)	0.25 (0.1-0.4)	11.2(AN11) 14.5(AN15)
			YBG205			
	Alloy tool steel *Leg. Werkzeugstahl*	180-350	YBM253	240 (180-320)	0.2 (0.1-0.4)	
			YBG205			
K	Cast iron *Gusseisen*	180-250	YBD152	270 (150-300)	0.25 (01.-0.4)	

Mounting double sided inserts:

Montage von doppelseitigen Wendeschneidplatten bei Fräsern:

Please make sure that the faces with same marks are in the same direction.

Bitte stellen Sie sicher, dass die Platten mit derselben Markierung in dieselbe Richtung angebracht werden.

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