AVANTEC®
MILLING. HIGHLY POSITIVE

CATALOG

It's all about **Q**

Finishing

High Precision

High Feed

Heavy Duty

Inserts
Shell end mills
Face milling cutters
Side milling cutters
Copy milling cutters
Shoulder milling cutters
Shank end mills
T-slot milling cutters
Circular milling cutters

Standard tooling and customized solutions

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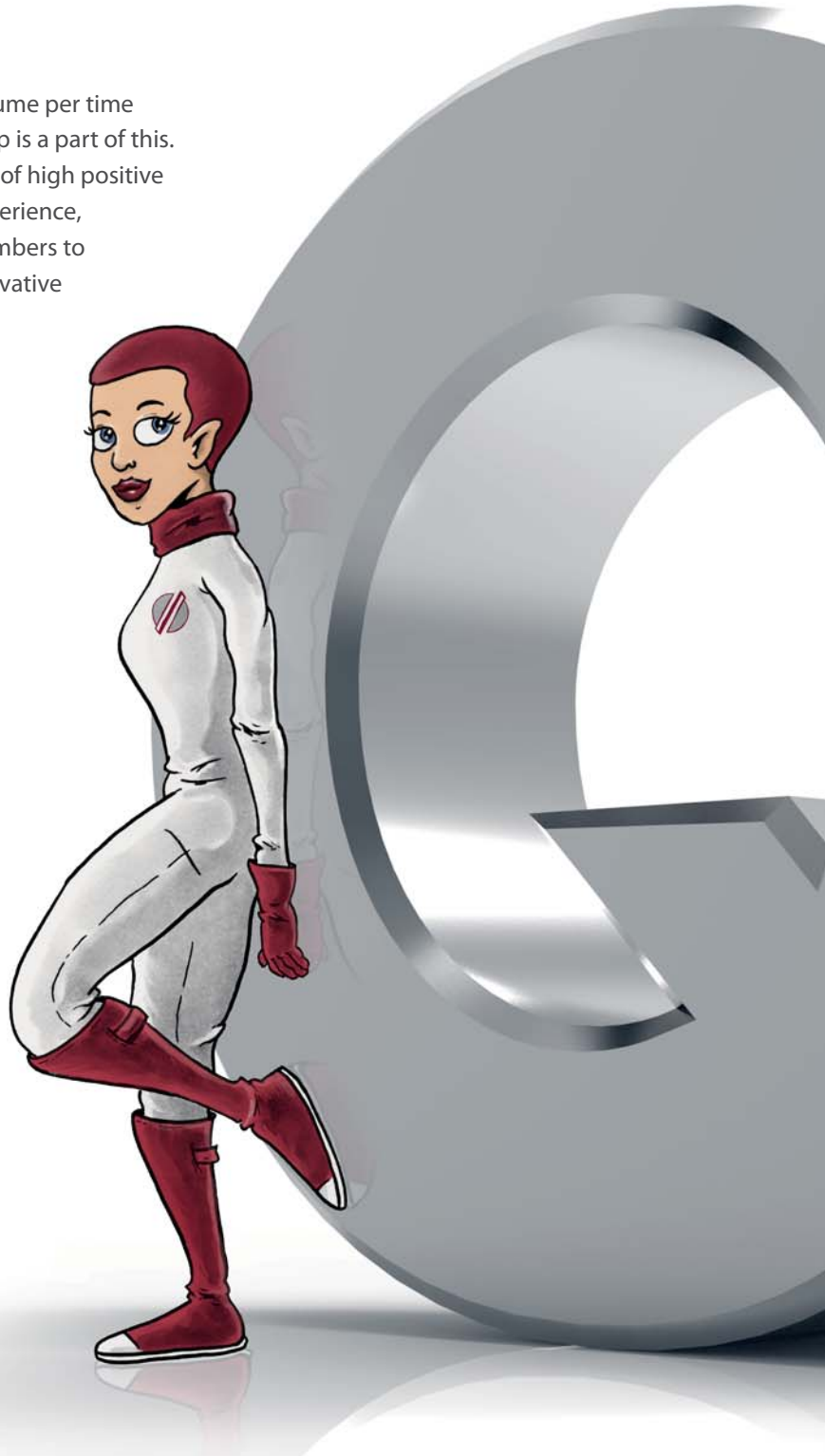
» It’s all about Q

In the world of machining, it’s all about Q, the chip volume per time unit - economic efficiency, return. And every single chip is a part of this. AVANTEC® is one of the world’s leading manufacturers of high positive milling tools. Putting our interdisciplinary industry experience, consistently evolving know-how and creative staff members to work for our clientele, we implement hundreds of innovative standard tooling and custom turnkey solutions year after year. AVANTEC® milling cutters are known in the industry for their high performance, long tool life, outstanding precision and always deliver maximum Q.

The purpose of this catalog is to provide you with all important and essential information needed to optimally plan and work with our milling tools at your manufacturing plant or production line.

We are at your disposal whenever you need assistance to find solutions for steel, cast iron and other hard material machining challenges. We are here to help – always focused on the objective to mill the maximum Q.



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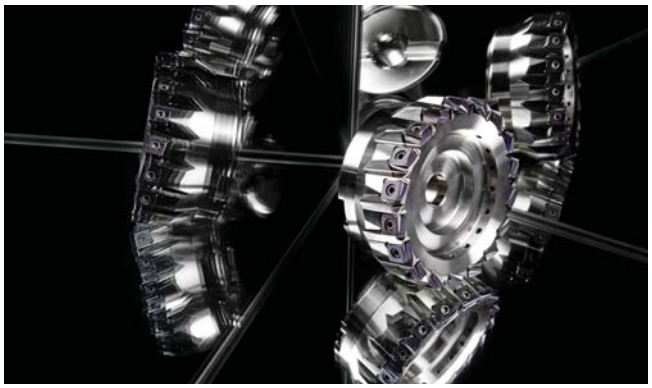
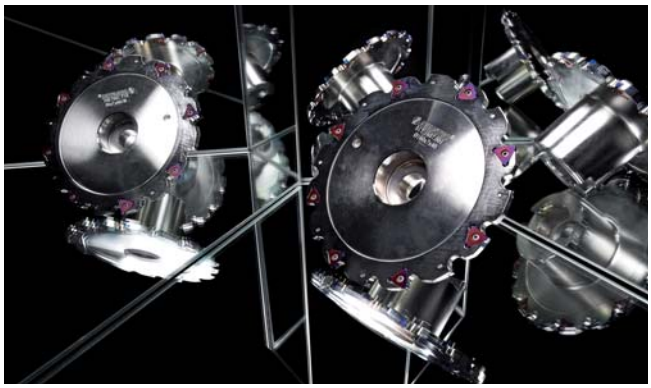
INFORMATION AND KNOW-HOW

SHELL END MILL





FACE MILLING CUTTER

SIDE MILLING CUTTER

CUTTING DATA

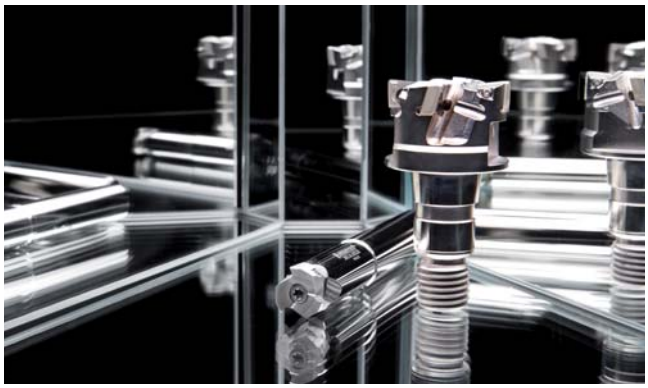
The following cutting data are based on average conditions:

A complete consideration of all circumstances is not possible: Therefore, we do not accept liability for these cutting data. Please contact our headquarters or your regular service consultant directly if you have process and workpiece specific questions.

COPY MILLING CUTTER

SHOULDER MILLING CUTTER AND SHANK END MILL

T-SLOT AND CIRCULAR MILLING CUTTER



PROGRAM

LEGEND

AS number of cutting edges | **BR** bottom ring
DR double cutting ring | **Ic** internal coolant
TK pitch circle | **ZR** intermediate ring

Standard tooling and customized solutions

In terms of machining technologies, our focus is entirely on the discipline of milling. We are pioneers and catalysts in this field. In standard tooling and custom turnkey projects, our innovative products and solutions set benchmarks for chip volume Q, outstanding precision as well as CPP and TCO cost effectiveness.

Automotive and aerospace, renewable energies, mechanical/plant engineering, tool manufacturing, hydraulics… with our AVANTEC® milling cutters, we have been developing and delivering solutions for virtually every single industry for decades, which have since become established standards. Our product portfolio covers more than 80% of all standard applications known to us.

Every day, we work in partnership with the design and production teams of machine tool manufacturers, OEMs, suppliers and numerous medium-sized production companies to develop new solutions and innovative milling tools for challenging tasks and materials.

Targeted deployment of know-how and experience

We have made it our mission to give you all the leeway and flexibility you need to deploy highly cost effective milling strategies and secure production processes with our AVANTEC® milling cutters combined with practice-oriented solutions. All AVANTEC® employees are committed to and work hard for the ultimate goal: your attainment of your maximum Q.

Direct distribution
Austria
Germany
Italy
United States of America

Distribution partners
Belgium
China
Czech Republic
Denmark
Finland
France
Great Britain
Hungary
India
Iran
Japan
Mexico
Netherlands
Norway
Poland
Republic of Korea
Russian Federation
Sweden
Switzerland
Turkey

AVANTEC® is an independent family-owned and operated company domiciled in Illingen, Baden-Wuerttemberg, Germany. Gustav Werthwein founded the company - AVANTEC® Zerspantechnik - in 1989. In 2002, his son Uli Werthwein joined him at the helm of the team of 100 employees.

We support our customers on site, at their manufacturing and production facilities – from the initial idea to the first machining run and well beyond. Moreover, we discuss the latest topics and practice-based questions at AVANTEC® seminars and we offer live machining demonstrations with learning by doing opportunities. We take the time to discuss specific issues and to answer individual questions. After all, your production and manufacturing projects are at the heart of everything we do.

High positive milling – soft cutting with max. Q

AVANTEC® milling cutters deploy their entire performance spectrum in heavy milling and dynamic HPC machining applications, precision milling and superfine surface milling. Our high positive tooling systems boast ground cutting edges and custom geometrics to ensure perfect chip flow and extraordinary precision.

Our high positive cutting edges always cut "softly" while running absolutely smoothly. The forces the machine tools have to mount for the machining processes are significantly less intense, which translates into reduced wear and tear for the machine tool. Hence, the machining of instable or delicate workpieces is process secure, the milling processes of wide overhang tools remain highly stable.

< Less wear and tear for machines and guides
< Higher chip volume
< Less driving power required
< Optimum machining of instable workpieces
< Improved chip flow

SP18

CM90

MM90

EK90

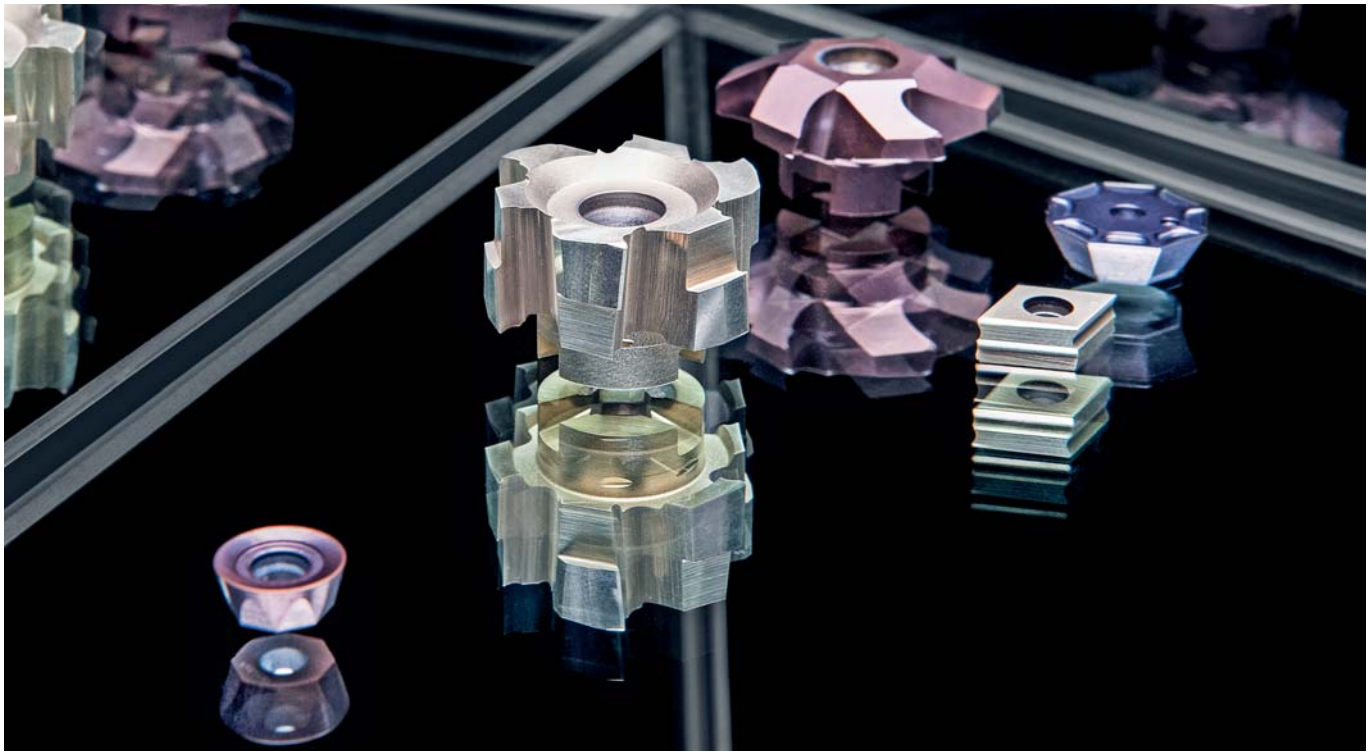
High Feed

Heavy Duty

High Precision

Finishing

Indexable inserts – ground precision



Your success with AVANTEC® milling cutters is the result of a perfect combination of numerous factors. We constantly optimize and improve the micro-geometries of our indexable inserts, test new finishing processes and different substrates.

In addition to material-related experiments, we conduct tests in which we machine select workpieces with different milling strategies. Only the best combinations are approved for serial production.

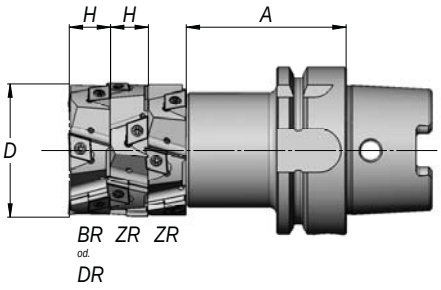
< Increased radial and axial run out precision
< Improved machining dimensional accuracy
< No parameter deviation
< Consistent surface quality
< Reduced noise level
< Improved chip flow
< Reduced heat development
< Longer tool life
< Optimum change accuracy

E N H Q 12 06 10 02718 S L 25 V SKY77

SHELL END MILL

Multiring CM90

< modular disk design
< custom cutting edge lengths up to 2.5 x D
< 4-cutting edge CN07 indexable insert and stable M3 fixation



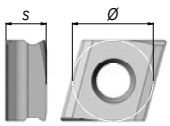
Shanks for Multiring CM90

D	SK60 DIN69871	A	Kg	SK50 DIN69871	A	Kg	SK40 DIN69871	A	Kg	HSK-A63	A	Kg	HSK-A100	A	Kg
32	▪	▪	▪	▪	▪	▪	09A.4032.001	39	0,91	09E.6332.1050	50	0,82	▪	▪	▪
40	▪	▪	▪	09A.5004.001	49	2,85	09A.4004.001	39	0,95	09E.6304.1060	60	0,94	▪	▪	▪

Tool holders Ø40 are incompatible with tool holders Ø40 EM90

ZR/BR/DR Multiring CM90

D	article ZR	H	z_{eff}	article BR	H	z_{eff}	number of inserts	article DR	H	z_{eff}	number of inserts
32	12C.3212.001	11	2	12C.3213.002	13	2	2 CNHQ07T306.L 2 CNHQ07T300.R	▪	▪	▪	▪
40	12C.4012.001	11	3	12C.4013.002	13	3	3 CNHQ07T306.L 3 CNHQ07T300.R	12C.4021.001	21	3	3 CNHQ07T306.L 3 CNHQ07T300.R 3 MOGU100310.R



insert | **incircle diameter**
ø 07 = 7,50

insert thickness
S T3 (CN) = 4,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
CN..07T3..	CNHQ07T30600811SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
			NERO^{2}77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	220	200	240	220	200	180		
	CNHQ07T30004301SR28V	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
			NERO^{2}77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	220	200	240	220	200	180		

vibration depending / surface depending

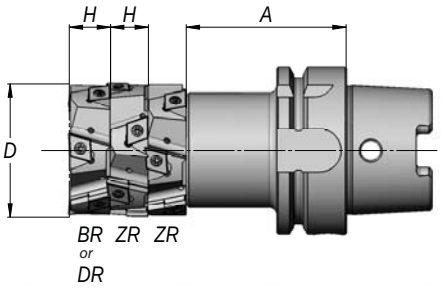
D	Kg ZR/BR/DR
32	< 0,5
40	< 0,5

insert		
CN..07T3…	08B.0375.7991	TX208

» Order information page 112-113
» Assembly instructions page 114

Multiring EM90

< modular discs allow various gage lengths up to 2,5 x D
< dual right and left helix design minimizes axial tractive and compressive forces

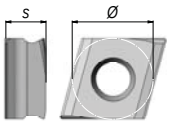


Shanks for Multiring CM90

D	SK60 DIN69871	A	Kg	SK50 DIN69871	A	Kg	SK40 DIN69871	A	Kg	HSK-A63	A	Kg	HSK-A100	A	Kg
32	▪	▪	▪	▪	▪	▪	09A.4032.001	39	0,92	09E.6332.1050	50	0,82	▪	▪	▪
40	▪	▪	▪	09A.5040.004	49	2,85	09A.4040.002	39	0,95	09E.6340.1060	60	0,92	▪	▪	▪
63	▪	▪	▪	09A.5063.008	49	3,21	▪	▪	▪	09E.6363.1060	60	1,28	09E.1063.1080	80	3,11
63	▪	▪	▪	09A.5063.031	100	4,30	▪	▪	▪	▪	▪	▪	▪	▪	▪
63	▪	▪	▪	09A.5063.021	150	5,36	▪	▪	▪	▪	▪	▪	▪	▪	▪
80	▪	▪	▪	09A.5080.006	49	3,56	▪	▪	▪	▪	▪	▪	09E.1080.1080	80	3,77
80	▪	▪	▪	09A.5080.025	100	5,35	▪	▪	▪	▪	▪	▪	▪	▪	▪
100	▪	▪	▪	09A.5010.002	49	3,75	▪	▪	▪	▪	▪	▪	09E.1010.1100	110	6,20
100	09A.6010.002	75	11,11	09A.5010.023	100	5,45	▪	▪	▪	▪	▪	▪	▪	▪	▪
125	09A.6012.001	75	13,44	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪

other dimensions on request

tool holders Ø40 are incompatible with tool holders Ø40 CM90



insert

incircle diameter

ø 06 =	6,35	ø 12 =	12,70
ø 08 =	8,00	ø 16 =	16,00
ø 09 =	9,52	ø 20 (LN) =	9,52
ø 10 =	10,00	ø 25 (LN) =	12,70

insert thickness

S 03 =	3,18	S 06 =	6,35
S T3 =	3,97	S 07 =	7,20
S 04 =	4,76	S 08 =	8,00
S 05 =	5,60	S 09 =	9,00

ZR/BR/DR Multiring EM90

D	article ZR	H	z_{eff}	article BR	H	z_{eff}	number of inserts	article DR	H	z_{eff}	number of inserts
32	12E.3210.001	10	2	12E.3211.002	11,5	2	2 ENHQ060300.R 2 ENHQ060304.L	▪	▪	▪	▪
40	12E.4010.001	10	2	12E.4010.002	11,5	2	2 ENHQ060300.R 2 ENHQ060304.L	12E.4018.001	18	4	2 ENHQ060300.R 4 ENHQ060304.L 2 ENHQ08T306.L
63	12E.6317.001	16	3	12E.6317.002	16,5	3	3 ENHQ090400.R 3 ENHQ090408.L	12E.6322.002	22	3	3 ENHQ090400.R 3 ENHQ120610.L 3 LNEX200710.R
	12E.6318.001	18	3	12E.6319.002	19,5	3	3 ENHQ100500.R 3 ENHQ100508.L	▪	▪	▪	▪
80	12E.8023.001	22	3	12E.8023.002	23,2	3	3 ENHQ120600.R 3 ENHQ120610.L	12E.8025.002	25	3	3 ENHQ120600.R 3 ENHQ120610.L 3 LNEX200710.R
100	12E.1023.003	22	4	12E.1023.004	23,2	4	4 ENHQ120600.R 4 ENHQ120610.L	12E.1026.001	26,7	4	4 ENHQ120600.R 4 ENHQ120610.L 4 LNEX25062500405TR25
125	12E.1229.003	29	5	12E.1231.001	31	5	5 ENHQ160900.R 5 ENHQ160915.L	▪	▪	▪	▪

D	Kg ZR/BR/DR
32	< 0,5
40	< 0,5
63	< 0,5
80	< 1,0
100	< 1,5
125	< 2,5

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron D20	cast iron D18	cast iron D17	steel A22	steel A20	steel A18	steel A16	steel B15	steel B14
EN..0603..	ENHQ06030402721SL28V	2	SKY77	h_{max}	0,1	0,08		0,1	0,1	0,08	0,08		
				v_c	200	180		200	180	160	140		
	ENHQ06030002620SR28V	2	SKY77	h_{max}	0,1	0,08		0,1	0,1	0,08	0,08		
				v_c	200	180		200	180	160	140		
	ENHQ06030400254SL30	2	SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,06	0,05		
				v_c	200	180	160	200	180	160	140		
	ENHQ06030000355SR30	2	SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,06	0,05		
				v_c	200	180	160	200	180	160	140		

vibration depending / surface depending

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENHQ08T30601726SL28V	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	220	200	180						
	ENHQ08T30001625SR28V	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
	ENHQ08T30600154SL30	4	SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	200	180	160	200	180	160	140		
	ENHQ08T30000255SR30	4	SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	200	180	160	200	180	160	140		
EN..0904..	ENHQ09040801726SL28V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	220	200	180						
	ENHQ09040001625SR28V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	220	200	180						
	ENHQ09040800354SL30	4	SKY77	h_{max}				0,13	0,12	0,1	0,08	0,08	0,07
				v_c				150	135	115	80	70	65
	ENHQ09040000255SR30	4	SKY77	h_{max}				0,13	0,12	0,1	0,08	0,08	0,07
				v_c				150	135	115	80	70	65
EN..1005..	ENHQ10050801740SL25V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		
	ENHQ10050801742SL28V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		
	ENHQ10050001641SR25V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		
	ENHQ10050001643SR28V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	200	180	160	200	180	160	140		

vibration depending / surface depending

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..1206..	ENHQ12061002718SL25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	220	200	180						
	ENHQ12060002619SR25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	220	200	180						
	ENHQ12061002913SL28W	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			
			NERO26	h_{max}	0,22	0,2	0,18						
				v_c	220	200	180						
	ENHQ12060002620SR28V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	220	200	180						
	ENHQ12061000352SL28	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18	0,15		
				v_c	200	180	160	200	180	160	140		
	ENHQ12060000253SR28	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18	0,15		
				v_c	200	180	160	200	180	160	140		
	ENHQ12061000354SL30	4	SKY77	h_{max}	0,18	0,15	0,14	0,18	0,16	0,15	0,13		
				v_c	200	180	160	200	180	160	140		
	ENHQ12060000255SR30	4	SKY77	h_{max}	0,18	0,15	0,14	0,18	0,16	0,15	0,13		
				v_c	200	180	160	200	180	160	140		
EN..1609..	ENHQ16091502713TL25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18	0,18		
				v_c	200	180	160	200	180	160	140		
	ENHQ16090002614TR25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18	0,18		
				v_c	200	180	160	200	180	160	140		
LN..2007..	LNEX20071000903TR25	2	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			
LN..2506..	LNEX25062500405TR25	2	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			

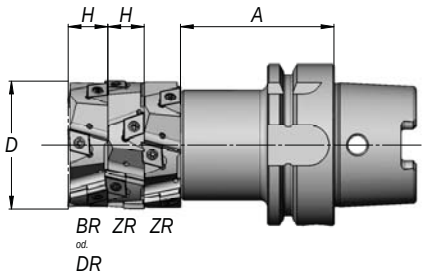
vibration depending / surface depending

insert		
EN..0603…	08B.2506.7991	TX208
EN..0904…	08B.3511.7991	TX215
EN..1005…	08B.3511.7991	TX215
EN..1206…	08B.0513.7991	TX220
EN..1609…	08B.0617.7991	TX225
LN..2007.R	08B.3511.7991	TX215
LN..2506.R	08B.4511.7991	TX220

» Order information page 112-113
» Assembly instructions page 114

Multiring FM90

< modular disk design
< custom cutting edge lengths up to 2.5 x D
< multi-toothed design because of fine tooth pitch



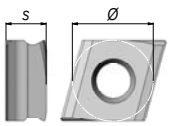
Shanks for Multiring FM90

D	SK60 DIN69871	A	Kg	SK50 DIN69871	A	Kg	SK40 DIN69871	A	Kg	HSK-A63	A	Kg	HSK-A100	A	Kg
45/50	▪	▪	▪	09A.5045.001	39	2,82	09A.4045.001	39	1,00	09E.6345.1060	60	1,02	09E.1045.001	85	3,3
45/50	▪	▪	▪	09A.5045.016	90	3,37	09A.4045.007	90	1,54	▪	▪	▪	▪	▪	▪
66	▪	▪	▪	09A.5063.008	49	3,21	▪	▪	▪	09E.6363.1060	60	1,28	09E.1063.1080	80	3,11
66	▪	▪	▪	09A.5063.031	100	4,30	▪	▪	▪	▪	▪	▪	▪	▪	▪
66	▪	▪	▪	09A.5063.021	150	5,36	▪	▪	▪	▪	▪	▪	▪	▪	▪
92	▪	▪	▪	09A.5092.001	49	3,68	▪	▪	▪	▪	▪	▪	09E.1092.001	80	4,27

other dimensions on request

ZR/BR/DR Multiring FM90

D	article ZR	H	z_{eff}	article BR	H	z_{eff}	number of inserts	article DR	H	z_{eff}	number of inserts
45	12F.4513.021	13	3	12F.4513.022	13,5	3	3 FNHQ08T300.R 3 FNHQ08T306.L	▪	▪	▪	▪
50	12F.5015.021	14,2	3	12F.5015.022	15,5	3	3 FNHQ08T300.R 3 FNHQ08T306.L	12F.5015.024	15	3	3 MOGT100308.R 3 FNHQ08T300.R
66	12F.6619.031	19,5	3	12F.6620.032	20	3	3 FNHQ110608.R 3 FNHQ110608.L	▪	▪	▪	▪
92	12F.9218.003	18,5	4	12F.9220.004	20	4	4 FNHQ110608.R 4 FNHQ110608.L	12F.9225.001	25	4	4 FNHQ110608.R 4 FNHQ110608.L 4 LNHX25082500201TR25



insert	incircle diameter		insert thickness	
	ø 08 =	8,00	S 03 (MO) =	3,60
	ø 10 =	10,00	S T3 =	3,97
	ø 11 =	11,00	S 06 =	6,35
	ø 25 (LN) =	12,70	S 08 =	8,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
FN..08T3..	FNHQ08T30600409SL28V	4	SKY 77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
			NERO 26	h_{max}	0,15	0,12	0,1						
				v_c	220	200	180						
	FNHQ08T30000510SR28V	4	SKY 77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	200	180	160	200	180	160	140		
			NERO 26	h_{max}	0,15	0,12	0,1						
				v_c	220	200	180						
FN..1106..	FNHQ11060801801TL25V	4	SKY 77	h_{max}	0,24	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			
	FNHQ11060801802SL28V	4	SKY 77	h_{max}	0,2	0,18	0,16	0,2	0,18	0,16			
				v_c	200	180	160	200	180	160			
	FNHQ11060801901TR25V	4	SKY 77	h_{max}	0,24	0,2	0,18	0,22	0,2	0,18			
				v_c	200	180	160	200	180	160			
	FNHQ11060801902SR28V	4	SKY 77	h_{max}	0,2	0,18	0,16	0,2	0,18	0,16			
				v_c	200	180	160	200	180	160			
LN..2508..	LNHX25082500201TR25	2	SKY 77	h_{max}	0,2	0,18	0,16	0,2	0,18	0,16			
				v_c	200	180	160	200	180	160			
MO..1003..	MOGU10031003104TR28	2	SKY 77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		

vibration depending / surface depending

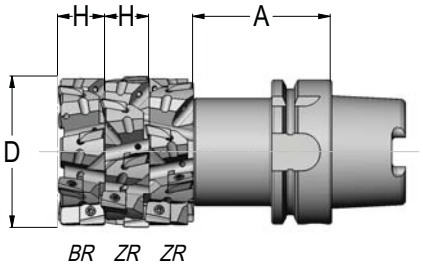
D	Kg ZR/BR/DR
45	< 0,5
50	< 0,5
66	< 0,5
92	< 1,0

insert		
FN..08T3…	08B.0309.7991	TX208
FN..1106…	08B.3511.7991	TX215
LN..2508.R	08B.0513.7991	TX220
MO..1003.R	08B.0375.7991	TX208

» Order information page 112-113
» Assembly instructions page 114

Multiring MM90

< particularly siutable to machine difficult materials
< extremely smooth running
< optimum precision paired with maximum Q



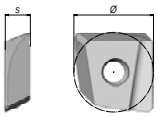
Shanks for Multiring MM90

D	SK60 DIN69871	A	Kg	SK50 DIN69871	A	Kg	SK40 DIN69871	A	Kg	HSK-A63	A	Kg	HSK-A100	A	Kg
66	■	■	■	09A.5050.015	49	3,00	■	■	■	■	■	■	■	■	■
66	■	■	■	■	■	■	■	■	■	09E.6350.1060	60	1,10	■	■	■
80	■	■	■	09A.5063.008	49	3,21	■	■	■	09E.6363.1060	60	1,28	09E.1063.1080	80	3,11
80	■	■	■	09A.5063.031	100	4,30	■	■	■	■	■	■	■	■	■
80	■	■	■	09A.5063.021	150	5,36	■	■	■	■	■	■	■	■	■
100	■	■	■	09A.5080.006	49	3,56	■	■	■	■	■	■	09E.1080.1080	80	3,77
100	■	■	■	09A.5080.025	100	5,35	■	■	■	■	■	■	■	■	■

other dimensions on request

ZR/BR Multiring MM90

D	article ZR	H	z_{eff}	article BR	H	z_{eff}	number of inserts
66	12M.6619.081	19,2	4	12M.6620.082	20,5	4	MOGU12T310.L MOGU12T310.R
80	12M.8019.081	19,2	4	12M.8020.082	20,5	4	MOGU12T310.L MOGU12T310.R
100	12M.1019.081	19,2	4	12M.1020.082	20,5	4	MOGU12T310.L MOGU12T310.R



insert	incircle diameter		insert thickness	
	ø 12 =	12,70	S T3 =	4,00

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
MO..12T3..	MO.12T3.082.01 TL28	2	SKY77	h_{max}	0,18	0,16	0,15	0,18	0,16	0,15	0,12		
				v_c	240	230	220	240	230	220	180		
	MO.12T3.082.01 TL28	2	AV1077	h_{max}				0,18	0,16	0,15	0,12	0,1	0,08
				v_c				240	230	220	180	160	140
	MO.12T3.081.01 TR28	2	SKY77	h_{max}	0,18	0,16	0,15	0,18	0,16	0,15	0,12		
				v_c	240	230	220	240	230	220	180		
	MO.12T3.081.01 TR28	2	AV1077	h_{max}				0,18	0,16	0,15	0,12	0,1	0,08
				v_c				240	230	220	180	160	140

vibration depending / surface depending

Allocation from machining parameters of AV material groups

					stainless steel			titanium	aluminium
	article	AS	grade		C11	C10	C09	C08	E80
MO..12T3..	MO.12T3.082.01 TL28	2	AV1077	h_{max}				0,08	0,15
				v_c				60-70	250-650
	MO.12T3.081.01 TR28	2	AV1077	h_{max}				0,08	0,15
				v_c				60-70	250-650

vibration depending / surface depending

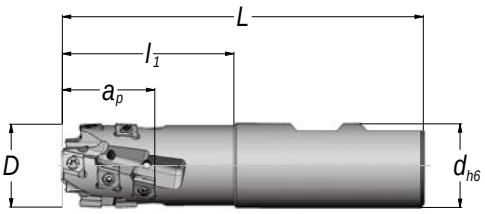
D	Kg ZR/BR
66	< 0,32
80	< 0,54
100	< 0,85

insert		
MO..12T3.L/R	08B.0309.001	TX208

» Order information page 112-113
» Assembly instructions page 114

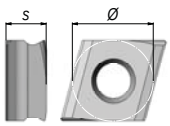
Shell end mill EW90

< fine tooth pitch thanks to tangential indexable insert installation
< soft cutting tool
< extremely smooth running thanks to cutting edge division



Shell end mill EW90

article	D	d_{h6}	L	l_1	zz	z_{eff}	a_p	ic	Kg	insert
02E.2510.001	25	25	108	51	10	2	27,0	yes	0,36	EN..0603.L
02E.3210.004	32	25	108	51	16	2	43,0	yes	0,43	EN..0603.L
02E.4012.001	40	32	120	53	14	2	43,0	yes	0,81	EN..08T3.L



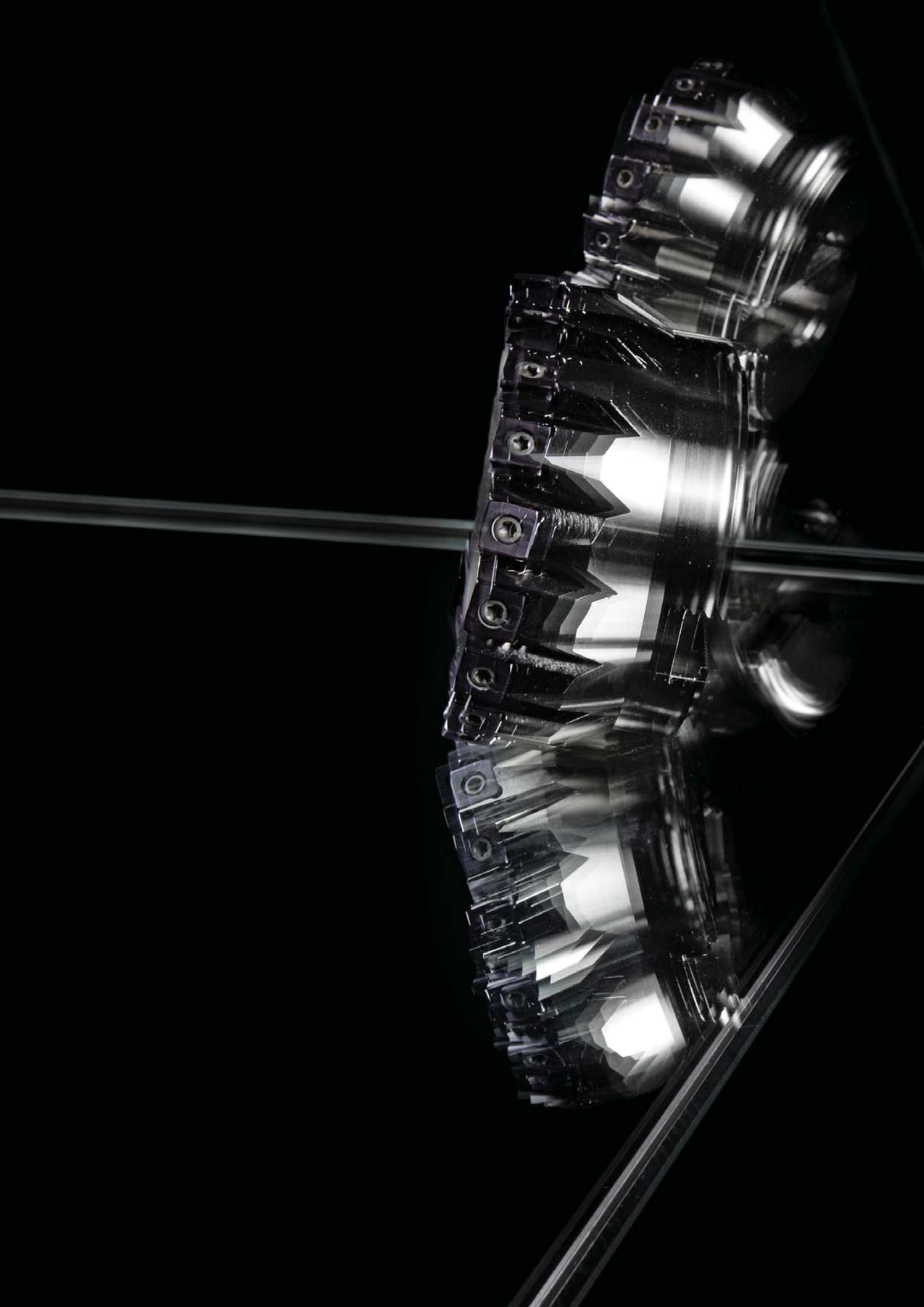
insert	incircle diameter		insert thickness	
	ø 06 =	6,35	S 03 =	3,18
	ø 08 =	8,00	S T3 =	3,97

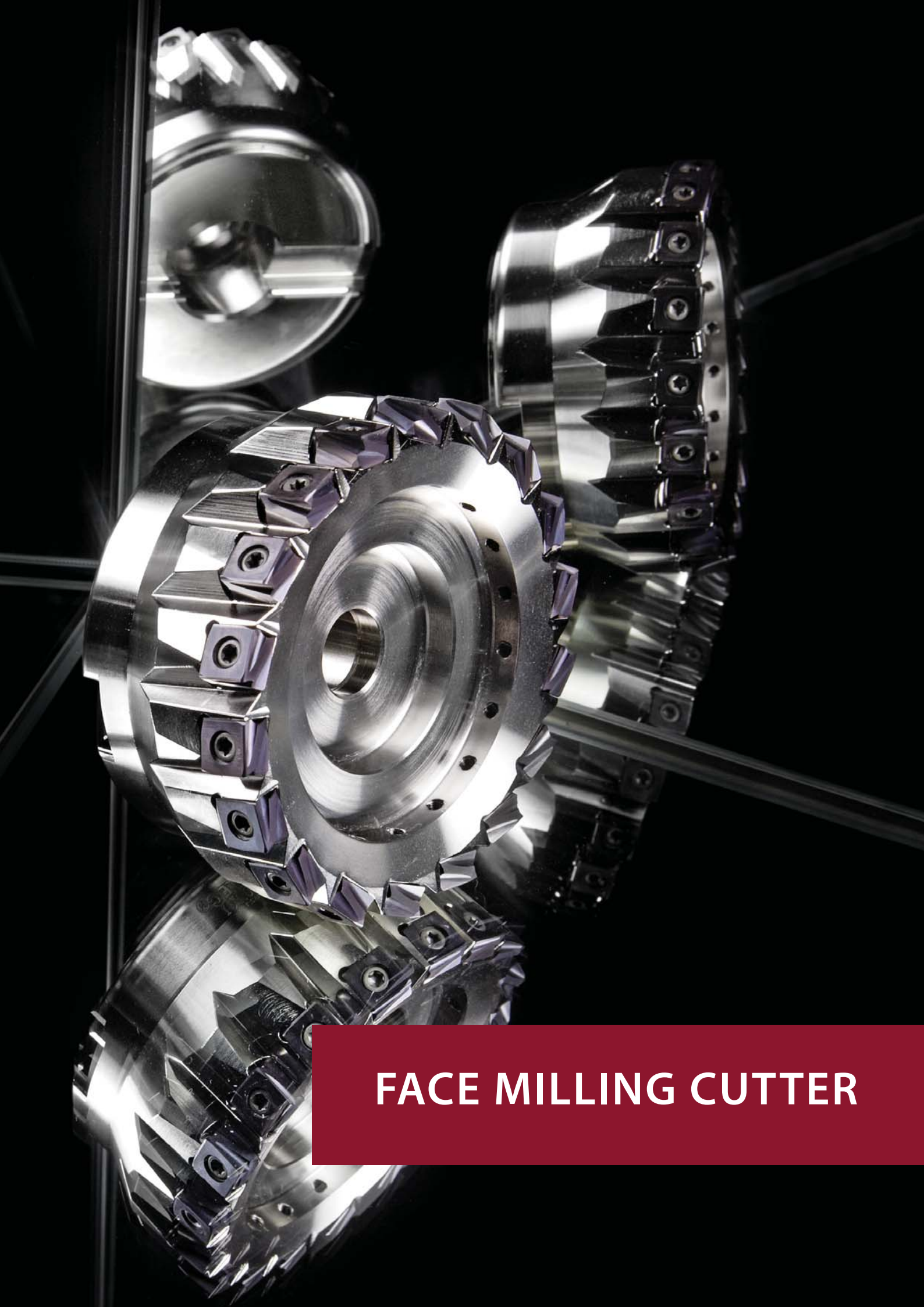
Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..0603..	ENHQ06030400254SL30	2	SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,06	0,05		
				v_c	200	180	160	200	180	160	140		
	ENHQ06030402721SL28V	2	SKY77	h_{max}	0,1	0,08		0,1	0,1	0,08	0,08		
				v_c	200	180		200	180	160	140		
EN..08T3..	ENHQ08T30601209SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601726SL28V	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
	ENHQ08T30600154SL30	4	SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		
	ENHQ08T30600156EL33	4	DELPH43	h_{max}					0,1	0,09	0,08	0,08	0,07
				v_c					180	150	100	90	80
			ICE43	h_{max}					0,1	0,09	0,08	0,08	0,07
				v_c					180	150	100	90	80

insert		
EN..0603.L	08B.2506.7991	TX208
EN..08T3.L	08B.0309.7991	TX208

» Assembly instructions page 114



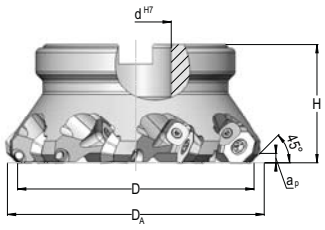


FACE MILLING CUTTER

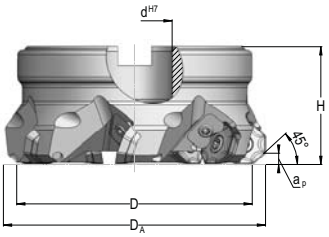
Avantop KC1.1/KC2.2

< universally applicable for cast iron and steel
< very good surface quality by plain cutting
< additional security due to the wedge system

Avantop KC1.1



Avantop KC2.2



Avantop KC1.1

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	ic	Kg	insert
03O.5043.020	50	58,8	43	22	6	3,5	yes	no	0,32	OF..1505.N
03O.6340.020	63	71,9	40	22	7	3,5	yes	yes	0,57	OF..1505.N
03O.8050.020	80	88,9	50	27	8	3,5	yes	yes	0,98	OF..1505.N
03O.1050.020	100	108,9	50	32	9	3,5	yes	no	1,75	OF..1505.N
03O.1263.020	125	133,9	63	40	11	3,5	yes	no	3,31	OF..1505.N
03O.1663.020	160	168,9	63	40	13	3,5	yes	no	4,79	OF..1505.N

set wedge			
08Z.0000.063	08K.1108.001	08Z.0000.010	TX220

Avantop KC2.2

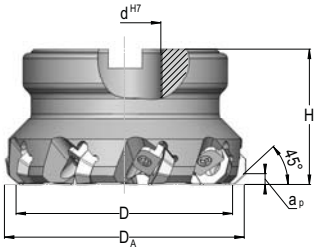
article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	ic	Kg	insert
03O.6340.010	63	74,2	40	22	5	5,0	yes	yes	0,56	OF..2006.N
03O.8050.012	80	91,3	50	27	6	5,0	yes	yes	1,14	OF..2006.N
03O.1050.010	100	111,0	50	32	7	5,0	yes	yes	2,21	OF..2006.N
03O.1263.010	125	136,3	63	40	8	5,0	yes	no	2,94	OF..2006.N
03O.1663.010	160	171,3	63	40	10	5,0	yes	no	5,02	OF..2006.N
03O.2063.010	200	211,3	63	60	12	5,0	yes	no	7,21	OF..2006.N

set wedge			
08Z.0000.134	08K.1008.003	08Z.0000.231	TX220

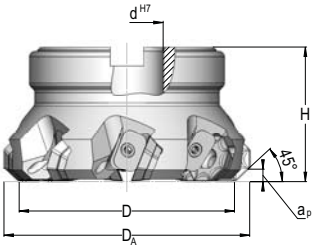
Avantop VC1.1/VC2.2

< economic efficiency especially with casting applications
< high material removal because of fine insert pitch
< easy indexing due to the wedge system

Avantop VC1.1



Avantop VC2.2



Avantop VC1.1

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	ic	Kg	insert
03O.5040.080	50	58,6	40	22	6	3,5	yes	no	0,42	OF..1505.N*
03O.6340.080	63	71,6	40	22	7	3,5	yes	no	0,61	OF..1505.N*
03O.8050.080	80	88,6	50	27	9	3,5	yes	no	1,48	OF..1505.N*
03O.1050.080	100	108,6	50	32	11	3,5	yes	no	2,34	OF..1505.N*
03O.1263.080	125	133,6	63	40	14	3,5	yes	no	3,55	OF..1505.N*

* without centre bore

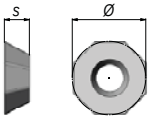
set wedge			
08Z.0000.128	08K.1205.001	08Z.0000.093	TX215

Avantop VC2.2

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	ic	Kg	insert
03O.6340.040	63	74,3	40	22	6	5,0	yes	yes	0,65	OF..2006.N*
03O.8050.240	80	91,3	50	27	7	5,0	yes	yes	1,31	OF..2006.N*
03O.1050.240	100	111,3	50	32	9	5,0	yes	yes	2,20	OF..2006.N*
03O.1263.240	125	136,3	63	40	11	5,0	yes	no	3,45	OF..2006.N*
03O.1663.240	160	171,3	63	40	14	5,0	yes	no	5,20	OF..2006.N*
03O.2063.240	200	211,3	63	60	18	5,0	yes	no	7,43	OF..2006.N*

* without centre bore

set wedge				tool
08Z.0000.126	08K.1908.001	08Z.0000.093	TX215	03O.6340.040
08Z.0000.146	08K.1610.002	08Z.0000.242	TX225	



insert	incircle diameter		insert thickness	
	ø 15 =	14,70	S 05 =	5,00
	ø 20 =	19,90	S 06 =	6,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
OF..1505..	OFEW1505M000132SN25S	8	CAN^{2}26	h_{max}	0,65	0,55	0,45						
				v_c	400	360	340						
	OFEW1505M000130SN28S		NERO^{2}77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4		
				v_c	360	320	280	340	320	280	280		
	OFEW1505M000131TN28S		SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4	0,4	0,35
				v_c	240	210	180	240	230	210	180	180	160
	OFEW1505M000140TN25		SKY77	h_{max}	0,65	0,55	0,45	0,55	0,5	0,45			
				v_c	240	210	180	240	230	210			
	OFEW1505M000141TN30		DELPH43	h_{max}							0,3	0,25	0,25
				v_c							160	150	140
	OFER1505M003206SN28S*		NERO^{2}77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4		
				v_c	360	320	280	340	320	280	280		
	OFER1505M003207TN28S*		SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4	0,4	0,35
				v_c	240	210	180	240	230	210	180	180	160
	OFER1505M003208SN25S*		CAN^{2}26	h_{max}	0,65	0,55	0,45						
				v_c	400	360	340						
OF..2006..	OFEW2006M000132SN25S	8	CAN^{2}26	h_{max}	0,65	0,55	0,45						
				v_c	400	360	340						
	OFEW2006M000130SN28S		NERO^{2}77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4		
				v_c	360	320	280	340	320	280	280		
	OFEW2006M000131TN28S		SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4	0,4	0,35
				v_c	240	210	180	240	230	210	180	180	160
	OFEW2006M000140TN23		SKY77	h_{max}	0,65	0,55	0,45	0,55	0,5	0,45			
				v_c	240	210	180	240	230	210			
	OFEW2006M000141TN30		DELPH43	h_{max}							0,3	0,25	0,25
				v_c							160	150	140
	OFER2006M003108SN28S*		NERO^2 77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4		
				v_c	360	320	280	340	320	280	280		
	OFER2006M003109TN28S*		SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4	0,4	0,35
				v_c	240	210	180	240	230	210	180	180	160
	OFER2006M003110SN25S*		CAN^{2}26	h_{max}	0,65	0,55	0,45						
				v_c	400	360	340						

* without centre bore for VC

Allocation from machining parameters of AV material groups

	article	AS	grade		stainless steel C11	stainless steel C10	stainless steel C09
OF..1505..	OFEW1505M000132SN25S	8	CAN²26	h_{max}			
				v_c			
	OFEW1505M000130SN28S		NERO²77	h_{max}			
				v_c			
	OFEW1505M000131TN28S		SKY77	h_{max}			
				v_c			
	OFEW1505M000140TN25		SKY77	h_{max}			
				v_c			
	OFEW1505M000141TN30		DELPH43	h_{max}	0,25	0,2	0,15
				v_c	140-100	120-90	110-80
	OFER1505M003206SN28S*		NERO²77	h_{max}			
				v_c			
	OFER1505M003207TN28S*		SKY77	h_{max}			
				v_c			
	OFER1505M003208SN25S*		CAN²26	h_{max}			
				v_c			
OF..2006..	OFEW2006M000132SN25S	8	CAN²26	h_{max}			
				v_c			
	OFEW2006M000130SN28S		NERO²77	h_{max}			
				v_c			
	OFEW2006M000131TN28S		SKY77	h_{max}			
				v_c			
	OFEW2006M000140TN23		SKY77	h_{max}			
				v_c			
	OFEW2006M000141TN30		DELPH43	h_{max}	0,25	0,2	0,15
				v_c	140-100	120-90	110-80
	OFER2006M003108SN28S*		NERO²77	h_{max}			
				v_c			
	OFER2006M003109TN28S*		SKY77	h_{max}			
				v_c			
	OFER2006M003110SN25S*		CAN²26	h_{max}			
				v_c			

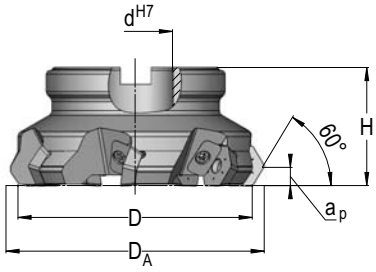
* without centre bore for VC

insert		
OF..1505.N	08B.4511.7991	TX220
OF..2006.N	08B.0513.7991	TX220

» Assembly instructions page 115

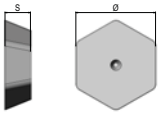
Face milling cutter HE60

< suitable for roughing and finishing with the same 6 cutting edge HE-insert
< large depth of cut
< easy indexing due to the wedge system



Face milling cutter HE60

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	TK	ic	Kg	insert
03H.1263.001	125	137,8	63	40	7	10	yes	▪	no	3,23	HE..2207.N
03H.1663.001	160	172,8	63	40	9	10	yes	66,7	no	5,26	HE..2207.N
03H.2063.001	200	212,8	63	60	11	10	yes	101,6	no	8,57	HE..2207.N



insert	incircle diameter	insert thickness
	ø 22 = 22,00	S 07 = 7,00

Allocation from machining parameters of AV material groups

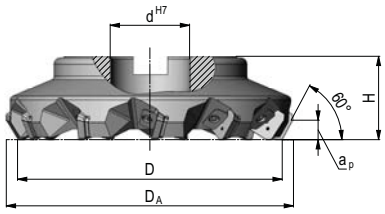
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
HE..2207..	HEHW2207M000202SN28	6	SKY77	h_{max}	0,7	0,55	0,4	0,7	0,6				
				v_c	240	220	200	240	200				
			NERO^{2}77	h_{max}	0,7	0,55	0,4	0,7	0,6				
				v_c	320	300	280	320	300				
			CAN^{2}77	h_{max}	0,7	0,55	0,4						
				v_c	350	320	300						
	HEHW2207M000204SN23		SKY77	h_{max}	0,8	0,65	0,4	0,7	0,6	0,5			
				v_c	240	200	180	240	200	180			
			NERO^{2}77	h_{max}	0,8	0,65	0,4	0,7	0,6	0,5			
				v_c	280	240	210	280	240	220			
	HEHT2207M000301SN28		SKY77	h_{max}				0,7	0,6	0,5	0,4	0,3	
				v_c				240	200	180	160	140	
			NERO^{2}77	h_{max}				0,7	0,6	0,5	0,4	0,3	
				v_c				320	300	220	180	160	

set wedge			
08Z.0000.145	08K.2010.001	08Z.0000.242	TX225

» Assembly instructions page 115

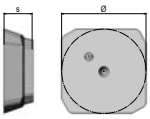
Face milling cutter SE60

< substantial depth of cut – up to 14 mm for maximum Q
< minimal power consumption, maximum machining performance



Face milling cutter SE60

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	TK	ic	Kg	insert
03S.1263.130	125	142,5	63	40	6	14	yes	▪	no	4,20	SE..2408.R
03S.1663.130	160	177,5	63	40	8	14	yes	66,7	no	5,40	SE..2408.R
03S.2063.130	200	217,5	63	60	11	14	yes	101,6	no	8,81	SE..2408.R



insert	incircle diameter	insert thickness
	ø 24 = 24,00	S 08 = 8,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
SE..2408..	SEHN24082000205SR23	4	SKY77	h_{max}	0,7	0,55	0,4	0,7	0,5				
				v_c	240	220	200	240	220				
			NERO^{2}77	h_{max}	0,7	0,55	0,4	0,7	0,5				
				v_c	320	300	280	280	240				
	SEHN24085000206SR23	4	SKY77	h_{max}	0,7	0,55	0,4	0,7	0,5				
				v_c	240	220	200	240	220				
			CAN^{2}77	h_{max}	0,7	0,55	0,4	0,7	0,5				
				v_c	320	300	280	280	240				

set wedge			
08Z.0000.145	08K.2010.001	08Z.0000.242	TX225

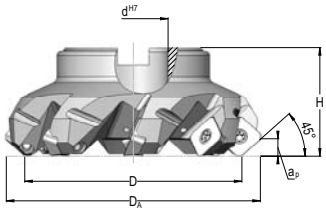
» Assembly instructions page 115

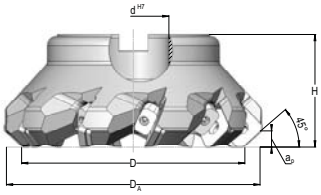
Face milling cutter SE45/SX45

Face milling cutter SE45

Face milling cutter SX45

< suitable for roughing and finishing with the same insert
< large depth of cut
< SE45: Long-chipping materials
< SX45: Multi-toothed design





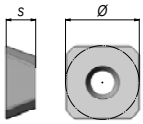
Face milling cutter SE45

article	D	D_A	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
03S.8050.005	80	96,9	50	27	6	8,4	yes	1,19	SE..1506.N
03S.1050.005	100	117,0	50	32	8	8,4	yes	1,70	SE..1506.N
03S.1263.008	125	142,0	63	40	8	8,4	yes	2,98	SE..1506.N
03S.1663.007	160	177,2	63	40	12	8,4	no	4,93	SE..1506.N
03S.2063.008	200	217,4	63	60	14	8,4	no	6,94	SE..1506.N

Face milling cutter SX45

article	D	D_A	H	d^{H7}	z_{eff}	a_p	wedge	ic	Kg	insert
03S.1263.031	125	145,2	63	40	10	8,8	yes	yes	3,87	SX..1906.N
03S.1663.032	160	180,4	63	40	12	8,8	yes	yes	5,99	SX..1906.N
03S.1663.031	160	180,2	63	40	16	8,8	yes	no	6,15	SX..1906.N

set wedge SX45			
08Z.0000.126	08K.1908.001	08Z.0000.093	TX215



insert | **incircle diameter**
ø 15 = 15,88
ø 19 = 19,00

insert thickness
S 06 = 6,35

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	**AS**	**grade**		**D20**	**D18**	**D17**	**A22**	**A20**	**A18**	**A16**	**B15**	**B14**
SE..1506..	SEHW1506AF00221SN25	4	SKY77	h_{max}	0,65	0,55	0,45	0,55	0,5	0,45	0,45		
				v_c	240	210	180	240	230	210	180		
	SEHW1506AF00222TN28		SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4	0,4	0,4	0,35
				v_c	240	210	180	240	230	210	180	180	160
SX..1906..	SXMW1906AF00221SN25	4	SKY77	h_{max}	0,6	0,5	0,4	0,5	0,45	0,4			
				v_c	240	210	180	240	230	210			
			CAN^{2}26	h_{max}	0,6	0,5	0,4						
				v_c	400	360	340						
	SXMW1906AF00222TN28		SKY77	h_{max}	0,55	0,45	0,35	0,45	0,4	0,4			
				v_c	240	210	180	240	230	210			

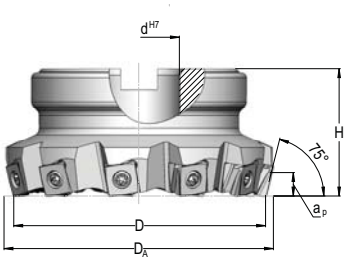
insert		
SE..1506.N	08B.4511.7991	TX220

» Assembly instructions page 115

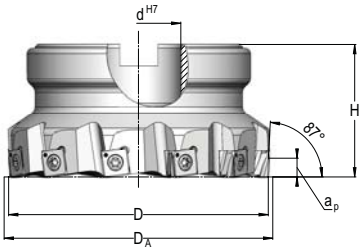
Signavant SN75/SN87

< for machining cast iron with extremely soft cut
< economic machining through eight cutting edge tangential SNHX insert
< large depth of cut allows high volumes of metal removal
< high process reliability

Signavant SN75



Signavant SN87+



Signavant SN75

article	D	D_A	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
03S.0850.090	80	85,8	50	27	9	5,5	no	1,20	SN..1208.L
03S.1050.090	100	105,8	50	32	11	5,5	no	2,03	SN..1208.L
03S.1263.090	125	130,8	63	40	14	5,5	no	3,05	SN..1208.L
03S.1663.090	160	165,8	63	60	17	5,5	no	4,68	SN..1208.L
03S.2063.090	200	205,8	63	60	20	5,5	no	8,73	SN..1208.L

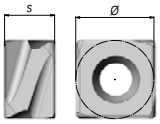
Signavant SN87

article	D	D_A	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
03S.0540.100	50	51,4	40	22	7	5,0	no	0,39	SN..1006.L
03S.0640.100	63	64,4	40	22	8	5,0	no	0,58	SN..1006.L
03S.0850.100	80	81,4	50	27	10	5,0	no	1,13	SN..1006.L
03S.0850.111	80	81,6	50	27	8	7,0	no	1,12	SN..1208.L
03S.1050.100	100	101,4	50	32	12	5,0	no	1,80	SN..1006.L
03S.1050.111	100	101,6	50	32	10	7,0	no	1,82	SN..1208.L
03S.1263.100	125	126,4	63	40	14	5,0	no	2,93	SN..1006.L
03S.1263.111	125	126,6	63	40	12	7,0	no	2,97	SN..1208.L
03S.1663.100	160	161,4	63	40	20	5,0	no	4,72	SN..1006.L
03S.1663.111	160	161,6	63	40	16	7,0	no	4,71	SN..1208.L

Signavant SN87+

article	D	D_A	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
03S.4040.101	40	41,4	40	16	5	5,0	yes	0,25	SN..1006.L*
03S.0640.101	63	64,4	40	22	10	5,0	no	0,58	SN..1006.L
03S.0850.101	80	81,4	50	27	15	5,0	no	1,16	SN..1006.L
03S.0850.190	80	81,6	50	27	9	7,0	no	1,15	SN..1208.L
03S.1050.101	100	101,4	50	32	18	5,0	no	1,88	SN..1006.L
03S.1263.101	125	126,4	63	40	23	5,0	no	3,02	SN..1006.L

* attention to different screw lengths



insert	incircle diameter		insert thickness	
	ø 10 =	10,00	S 06 =	6,00
	ø 12 =	12,50	S 08 =	8,00

Allocation from machining parameters of AV material groups

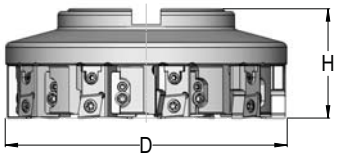
	article	AS	grade		cast iron		
					D20	D18	D17
SN..1006..	SNHX10060800304SL28	8	NERO26	h_{max}	0,25	0,2	0,18
				v_c	260	240	220
			CAN^{2}26	h_{max}	0,25	0,2	0,18
				v_c	380	360	340
	SNHX10060800303TL28		SKY77	h_{max}	0,25	0,2	0,18
				v_c	240	230	220
	SNKY10060801801TL23	8	SKY26	h_{max}	0,25	0,2	0,18
				v_c	240	230	220
			CAN^{2}26	h_{max}	0,25	0,2	0,18
				v_c	380	360	340
	SN.1006.018.02 SL28		CAN^{2}26	h_{max}	0,25	0,2	0,18
				v_c	380	360	340
SN..1208.. (for SN75)	SNHX12080800305SL25	8	NERO26	h_{max}	0,32	0,28	0,24
				v_c	260	240	220
			CAN^{2}26	h_{max}	0,32	0,28	0,24
				v_c	400	380	360
SN..1208.. (for SN87)	SNHX12081200701TL25	8	SKY77	h_{max}	0,32	0,28	0,24
				v_c	240	230	220
			NERO26	h_{max}	0,32	0,28	0,24
				v_c	260	240	220
			CAN^{2}26	h_{max}	0,32	0,28	0,24
				v_c	400	380	360

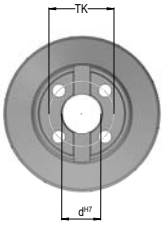
insert		
SN..1006.L*	08B.3511.7991	TX215
SN..1006.L	08B.3514.7991	TX215
SN..1208.L	08B.0416.7991	TX215

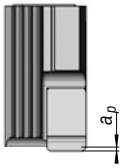
* attention to different screw lengths

Finavant EK90

< finishing cutter for best surface quality and flatness
< supreme surface quality due to the sophisticated cutting edge geometry of EN08 indexable inserts
< exact fit of the cartridge in the cutter body
< easy set-up





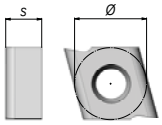


Finavant EK90

article	D	H	d^{H7}	TK	z_{eff}	a_p	ic	Kg	cartridge
04E.0650.140	63	50	22	▪	5	0,1 - 0,3	yes	0,87	K-EN08
04E.0850.140	80	50	27	▪	6	0,1 - 0,3	yes	1,45	K-EN08
04E.1060.001	100	62	32	▪	6	0,1 - 0,3	no	2,50	K-EN12
04E.1060.005	100	62	32	▪	6	0,1 - 0,3	no	2,46	K-EN08-g
04E.1260.001	125	62	40	▪	8	0,1 - 0,3	no	3,90	K-EN12
04E.1260.005	125	62	40	▪	8	0,1 - 0,3	no	3,84	K-EN08-g
04E.1660.001	160	62	40	66,7	10	0,1 - 0,3	no	5,73	K-EN12
04E.1660.005	160	62	40	66,7	10	0,1 - 0,3	no	5,67	K-EN08-g

cartridge EK90	complete set*	insert
K-EN08	08Z.0000.303	EN..08T3.L
K-EN08-g	08Z.0000.301	EN..08T3.L
K-EN12	08Z.0000.302	EN..1208.L

* complete set consists of cartridge and all attachment and assembly parts



insert	incircle diameter		insert thickness	
	ø 08 =	8,00	S T3 =	4,00
	ø 12 =	12,70	S 08 =	8,00

Allocation from machining parameters of AV material groups

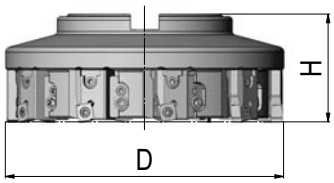
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENFQ08T31006304EL33S	2	SKY77	h_{max}	3,0								
				v_c	10 - 400 - vibration depending / surface depending								
			NERO26	h_{max}	3,0								
				v_c	10 - 400 - vibration depending / surface depending								
EN..1208..	ENFQ12080804104EL33S	2	SKY77	h_{max}	5,0								
				v_c	10 - 400 - vibration depending / surface depending								
			NERO26	h_{max}	5,0								
				v_c	10 - 400 - vibration depending / surface depending								

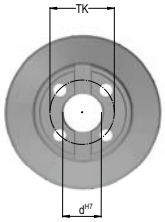
insert		
EN..08T3.L	08B.0375.7991	TX208
EN..08T3.L für K-EN08-g	08B.0309.7991	TX208
EN..1208.L	08B.0516.7991	TX220

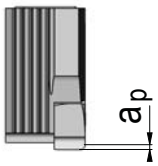
» Assembly instructions page 116

Finavant SK90

< best surface quality and flatness
< extremely high tooth feed rate and 4-cutting edge SN indexable insert
< exact fit of the cartridge in the cutter body
< easy set-up





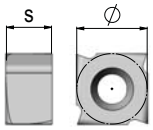


Finavant SK90

article	D	H	d^{H7}	TK	z_{eff}	a_p	ic	Kg	cartridge
04E.1060.010	100	62	32	▪	6	0,1 - 0,3	no	2,47	K-SN10
04E.1260.010	125	62	40	▪	8	0,1 - 0,3	no	3,86	K-SN10
04E.1660.010	160	62	40	66,7	10	0,1 - 0,3	no	5,70	K-SN10

cartridge SK90	complete set*	insert
K-SN10	08Z.0000.304	SN.1006.042.01

* complete set consists of cartridge and all attachment and assembly parts



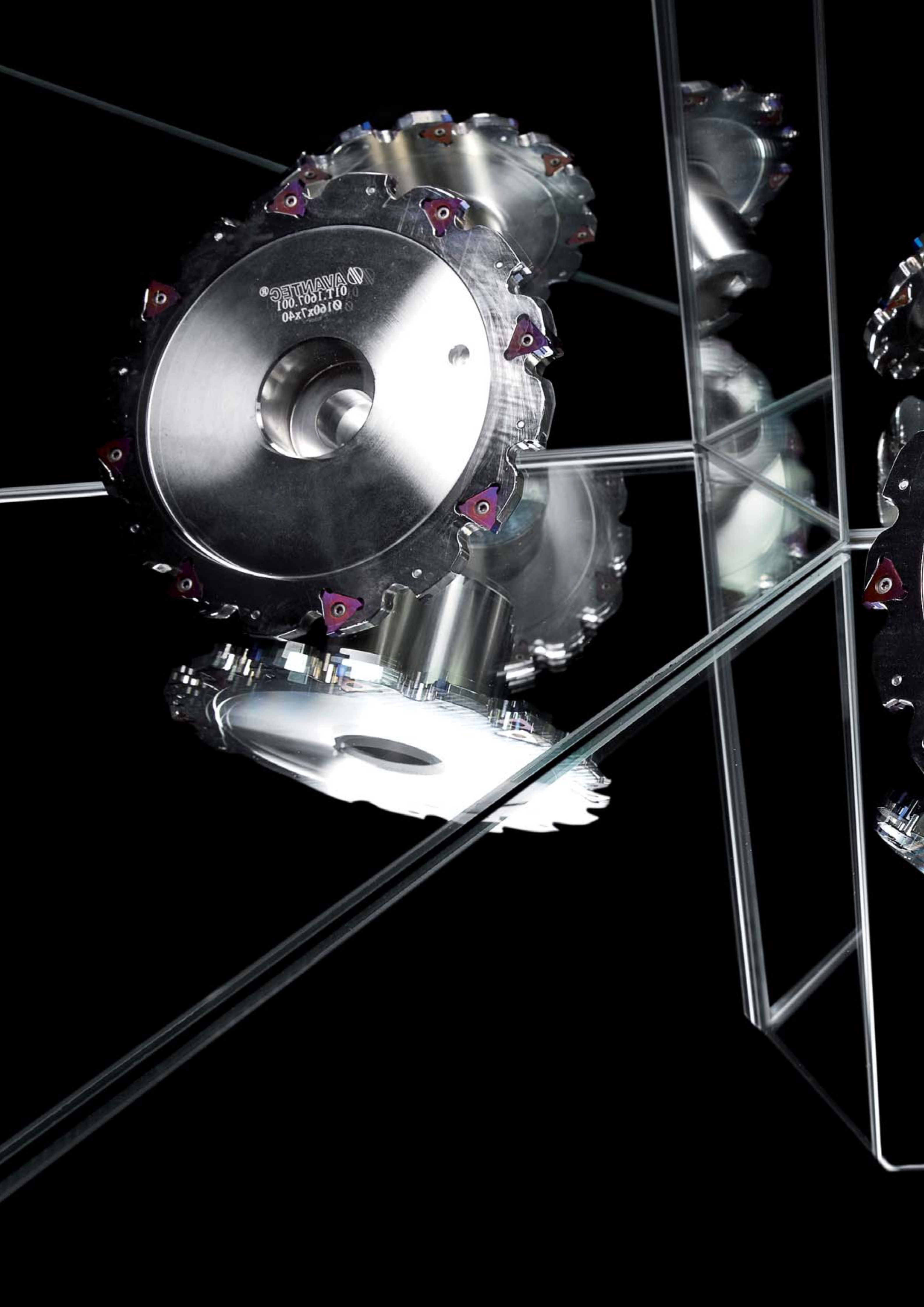
insert	incircle diameter	insert thickness
	ø 10 = 10,00	S 06 = 6,40

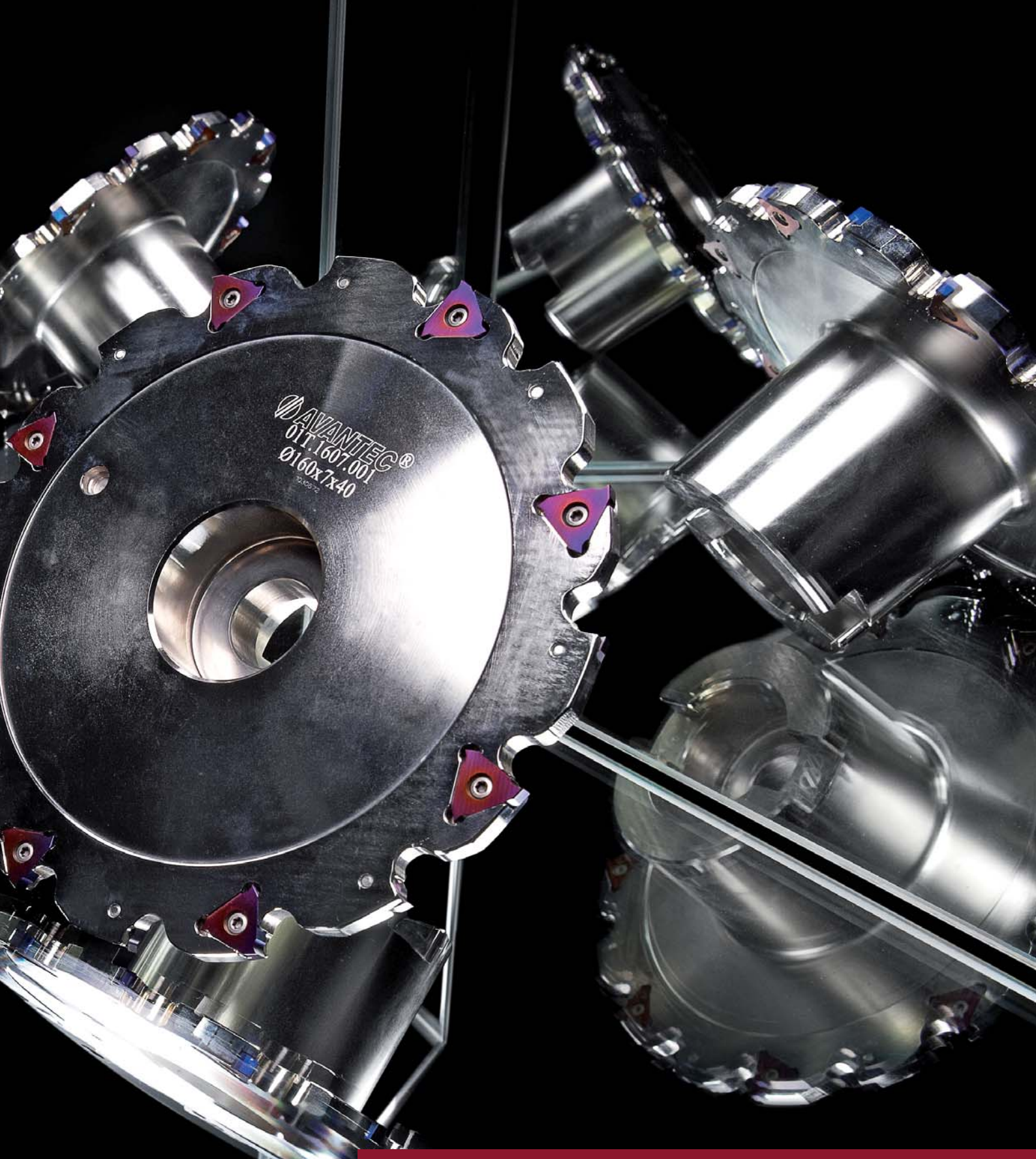
Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
SN..1006..	SN.1006.042.01 EL33S	4	SKY77	h_{max}	3,0								
				v_c	10 - 400 - vibration depending / surface depending								

insert		
SN.1006.042.01	08B.3511.7991	TX215

» Assembly instructions page 116





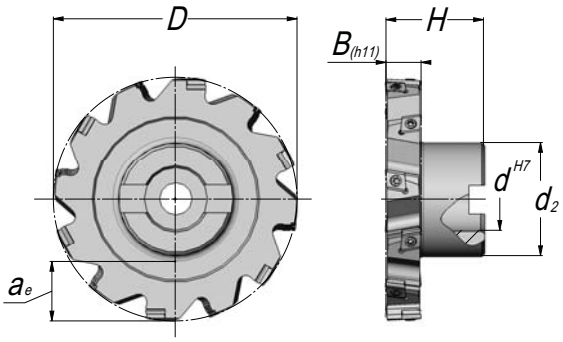
SIDE MILLING CUTTER

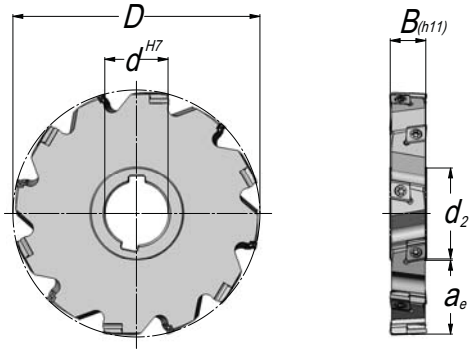
Side milling cutter tangential EB18/EN18

Side milling cutter EB18

Side milling cutter EN18

< 4 cutting edge EN indexable insert
< fine tooth pitch through tangential insert style
< smooth cutting by using left and right insert
< secondary cutting edge is protected outside the cutting zone
< face milling is possible





Side milling cutter EB18

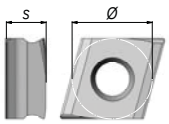
article	D	H	$B_{(h11)}$	d^{H7}	d_2	zz	z_{eff}	a_e	ic	Kg	insert
01E.1214.001	125	50	14	32	58	7 x 2	7	32,0	no	1,54	EN..08T3.R/L
01E.1216.001	125	50	16	32	58	6 x 2	6	32,0	no	1,64	EN..0904.R/L
01E.1218.001	125	50	18	32	58	6 x 2	6	32,0	no	1,77	EN..0904.R/L
01E.1614.001	160	63	14	40	70	9 x 2	9	43,0	no	2,80	EN..08T3.R/L
01E.1616.001	160	63	16	40	70	8 x 2	8	43,0	no	2,83	EN..0904.R/L
01E.1618.001	160	63	18	40	70	8 x 2	8	43,0	no	3,10	EN..0904.R/L
01E.1620.001	160	63	20	40	70	7 x 2	7	43,0	no	3,20	EN..1206.R/L
01E.1622.001	160	63	22	40	70	7 x 2	7	43,0	no	3,40	EN..1206.R/L
01E.1624.001	160	63	24	40	70	7 x 2	7	43,0	no	3,63	EN..1206.R/L
01E.2018.003	200	63	18	40	70	9 x 2	9	63,0	no	4,50	EN..0904.R/L
01E.2020.007	200	63	20	40	70	9 x 2	9	63,0	no	4,70	EN..1206.R/L
01E.2022.002	200	63	22	40	70	9 x 2	9	63,0	no	5,07	EN..1206.R/L
01E.2520.004	250	68	20	50	90	11 x 2	11	78,0	no	7,50	EN..1206.R/L
01E.2524.004	250	68	24	50	90	11 x 2	11	78,0	no	8,74	EN..1206.R/L

other dimensions on request

Side milling cutter EN18

article	D	$B_{(h11)}$	d^{H7}	d_2	zz	z_{eff}	a_e	ic	Kg	insert
14E.1214.001	125	14	32	46	7 x 2	7	37,0	no	1,00	EN..08T3.R/L
14E.1216.001	125	16	32	46	6 x 2	6	37,0	no	1,19	EN..0904.R/L
14E.1218.001	125	18	32	46	6 x 2	6	37,0	no	1,33	EN..0904.R/L
14E.1614.003	160	14	40	55	9 x 2	9	50,0	no	1,70	EN..08T3.R/L
14E.1616.001	160	16	40	55	8 x 2	8	50,0	no	1,87	EN..0904.R/L
14E.1618.001	160	18	40	55	8 x 2	8	50,0	no	2,14	EN..0904.R/L
14E.1620.005	160	20	40	55	7 x 2	7	50,0	no	2,35	EN..1206.R/L
14E.1622.001	160	22	40	55	7 x 2	7	50,0	no	2,71	EN..1206.R/L
14E.1624.001	160	24	40	55	7 x 2	7	50,0	no	2,87	EN..1206.R/L
14E.2020.001	200	20	50	68	9 x 2	9	63,0	no	3,57	EN..1206.R/L

other dimensions on request



insert	incircle diameter		insert thickness	
	ø 08=	8,00	S T3 =	3,97
	ø 09 =	9,52	S 04 =	4,76
	ø 12 =	12,70	S 06 =	6,35

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENHQ08T30601209SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601409SR28W		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601726SL28V		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601626SR28V		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30600154SL30		SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		
	ENHQ08T30600254SR30		SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		
EN..0904..	ENHQ09040802312SL28W	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040802212SR28W		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040801726SL28V		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040801626SR28V		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040800354SL30		SKY77	h_{max}						0,1	0,08	0,08	0,07
				v_c						130	100	90	80
	ENHQ09040800254SR30		SKY77	h_{max}						0,1	0,08	0,08	0,07
				v_c						130	100	90	80

Allocation from machining parameters of AV material groups

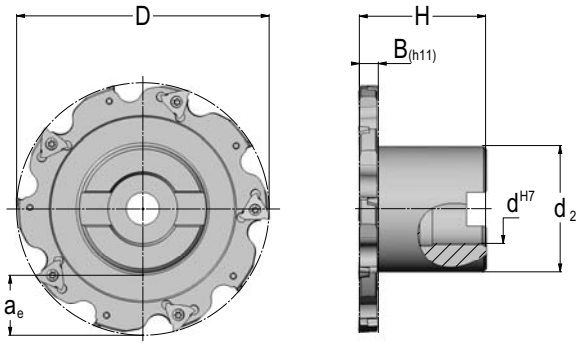
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..1206..	ENHQ12061002718SL25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	280	270	260						
	ENHQ12061002618SR25V		SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	280	270	260						
	ENHQ12061002913SL28W		SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,22	0,2	0,18						
				v_c	280	270	260						
	ENHQ12061003013SR28W		SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
	ENHQ12061000354SL30		SKY77	h_{max}				0,18	0,16	0,15	0,13		
				v_c				240	240	230	220		
	ENHQ12061000254SR30		SKY77	h_{max}				0,18	0,16	0,15	0,15		
				v_c				240	240	230	220		

insert		
EN..08T3.R/L	08B.0309.7991	TX208
EN..0904.R/L	08B.3511.7991	TX215
EN..1206.R/L	08B.0513.7991	TX220

» Assembly instructions page 114

Side milling cutter TB18

< a balanced smooth cut is provided by using right and left inserts
< very precise width of cut
< high precision of radial and axial run out
< triangular housing of the T-form insert



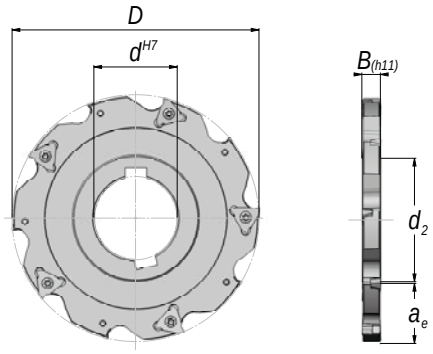
Side milling cutter TB18

article	D	H	$B_{(h11)}$	d^{H7}	d_2	zz	z_{eff}	a_e	ic	Kg	insert
01T.0605.001	63	32	5	16	32	4 x 2	4	13,0	no	0,22	TC..1102.R/L
01T.0606.001	63	32	6	16	32	4 x 2	4	13,0	no	0,23	TC..1103.R/L
01T.0610.001	63	32	10	16	32	3 x 2	3	13,0	no	0,30	TN..1606.R/L
01T.0805.001	80	40	5	22	40	5 x 2	5	18,0	no	0,39	TC..1102.R/L
01T.0806.001	80	40	6	22	40	5 x 2	5	18,0	no	0,41	TC..1103.R/L
01T.0808.001	80	40	8	22	40	4 x 2	4	18,0	no	0,47	TN..1604.R/L
01T.0810.001	80	40	10	22	40	4 x 2	4	18,0	no	0,53	TN..1606.R/L
01T.0812.001	80	40	12	22	40	4 x 2	4	18,0	no	0,57	TN..1606.R/L*
01T.1005.001	100	45	5	27	45	7 x 2	7	25,0	no	0,58	TC..1102.R/L
01T.1006.001	100	45	6	27	45	7 x 2	7	25,0	no	0,62	TC..1103.R/L
01T.1008.001	100	45	8	27	45	5 x 2	5	25,0	no	0,70	TN..1604.R/L
01T.1010.001	100	45	10	27	45	5 x 2	5	25,0	no	0,79	TN..1606.R/L
01T.1012.001	100	45	12	27	45	5 x 2	5	25,0	no	0,86	TN..1606.R/L*
01T.1205.001	125	50	5	32	58	9 x 2	9	32,0	no	1,04	TC..1102.R/L
01T.1206.001	125	50	6	32	58	9 x 2	9	32,0	no	1,09	TC..1103.R/L
01T.1208.001	125	50	8	32	58	6 x 2	6	32,0	no	1,22	TN..1604.R/L
01T.1210.001	125	50	10	32	58	6 x 2	6	32,0	no	1,36	TN..1606.R/L
01T.1212.001	125	50	12	32	58	6 x 2	6	32,0	no	1,49	TN..1606.R/L*
01T.1606.001	160	63	6	40	68	11 x 2	11	44,0	no	1,85	TC..1103.R/L
01T.1607.001	160	63	7	40	68	8 x 2	8	44,0	no	1,97	TN..16T3.R/L
01T.1608.001	160	63	8	40	68	8 x 2	8	44,0	no	2,08	TN..1604.R/L
01T.1609.001	160	63	9	40	68	8 x 2	8	44,0	no	2,20	TN..1604.R/L*
01T.1610.001	160	63	10	40	68	8 x 2	8	44,0	no	2,32	TN..1606.R/L
01T.1612.001	160	63	12	40	68	8 x 2	8	44,0	no	2,40	TN..1606.R/L*

other dimensions on request
* attention to different screw lengths

Side milling cutter TN18

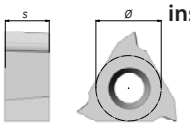
< a balanced smooth cut is provided by using right and left inserts
< very precise width of cut
< high precision of radial and axial run out
< triangular housing of the T-form insert



Side milling cutter TN18

article	D	$B_{(h11)}$	d^{H7}	d_2	zz	z_{eff}	a_e	ic	Kg	insert
14T.0605.001	63	5	22	34	4 x 2	4	12,0	no	0,08	TC..1102.R/L
14T.0606.001	63	6	22	34	4 x 2	4	12,0	no	0,10	TC..1103.R/L
14T.0805.001	80	5	27	40	5 x 2	5	18,0	no	0,14	TC..1102.R/L
14T.0806.001	80	6	27	40	5 x 2	5	18,0	no	0,17	TC..1103.R/L
14T.0810.001	80	10	27	40	4 x 2	4	18,0	no	0,30	TN..1606.R/L
14T.1005.001	100	5	32	46	7 x 2	7	25,0	no	0,21	TC..1102.R/L
14T.1006.001	100	6	32	46	7 x 2	7	25,0	no	0,27	TC..1103.R/L
14T.1007.001	100	7	32	46	5 x 2	5	25,0	no	0,32	TN..16T3.R/L
14T.1008.001	100	8	32	46	5 x 2	5	25,0	no	0,37	TN..1604.R/L
14T.1009.001	100	9	32	46	5 x 2	5	25,0	no	0,42	TN..1604.R/L*
14T.1010.001	100	10	32	46	5 x 2	5	25,0	no	0,47	TN..1606.R/L
14T.1012.001	100	12	32	46	5 x 2	5	25,0	no	0,57	TN..1606.R/L*
14T.1205.001	125	5	32	46	9 x 2	9	37,0	no	0,36	TC..1102.R/L
14T.1206.001	125	6	32	46	9 x 2	9	37,0	no	0,44	TC..1103.R/L
14T.1207.001	125	7	32	46	6 x 2	6	37,0	no	0,52	TN..16T3.R/L
14T.1208.001	125	8	32	46	6 x 2	6	37,0	no	0,61	TN..1604.R/L
14T.1209.001	125	9	32	46	6 x 2	6	37,0	no	0,69	TN..1604.R/L*
14T.1210.001	125	10	32	46	6 x 2	6	37,0	no	0,78	TN..1606.R/L
14T.1212.001	125	12	32	46	6 x 2	6	37,0	no	0,92	TN..1606.R/L*
14T.1606.001	160	6	40	55	11 x 2	11	50,0	no	0,72	TC..1103.R/L
14T.1607.001	160	7	40	55	8 x 2	8	50,0	no	0,84	TN..16T3.R/L
14T.1608.001	160	8	40	55	8 x 2	8	50,0	no	0,97	TN..1604.R/L
14T.1609.001	160	9	40	55	8 x 2	8	50,0	no	1,12	TN..1604.R/L*
14T.1610.001	160	10	40	55	8 x 2	8	50,0	no	1,25	TN..1606.R/L
14T.1612.001	160	12	40	55	8 x 2	8	50,0	no	1,54	TN..1606.R/L*
14T.2007.001	200	7	40	55	10 x 2	10	70,0	no	1,40	TN..16T3.R/L
14T.2008.001	200	8	40	55	10 x 2	10	70,0	no	1,59	TN..1604.R/L
14T.2009.001	200	9	40	55	10 x 2	10	70,0	no	1,81	TN..1604.R/L*
14T.2010.001	200	10	40	55	10 x 2	10	70,0	no	1,98	TN..1606.R/L
14T.2012.001	200	12	40	55	10 x 2	10	70,0	no	2,43	TN..1606.R/L*
14T.2508.001	250	8	50	68	12 x 2	12	89,0	no	2,51	TN..1604.R/L
14T.2510.001	250	10	50	68	12 x 2	12	89,0	no	3,22	TN..1606.R/L
14T.2512.001	250	12	50	68	12 x 2	12	89,0	no	3,91	TN..1606.R/L*

other dimensions on request
* attention to different screw lengths



insert | **incircle diameter**

ø 11 = 6,35
ø 16 = 9,52

insert thickness

S 02 = 2,60
S 03 = 3,20
S T3 = 3,97
S 04 = 4,76
S 06 = 6,40

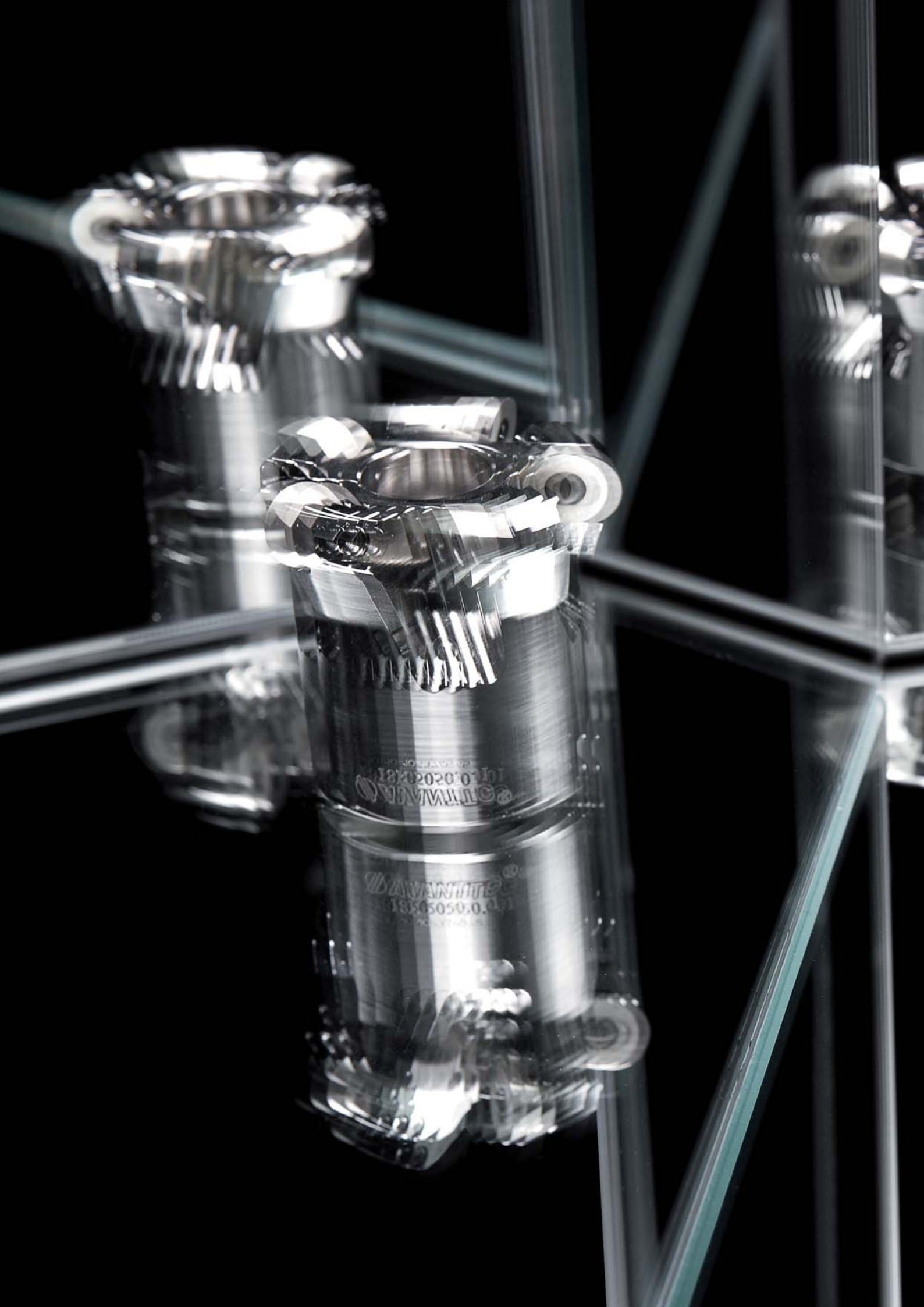
Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
TC..1102..	TCAW1102ZZ00435TL28	3	SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08	0,06		
				v_c	240	230	220	240	240	230	220		
	TCAW1102ZZ00535TR28		SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08	0,06		
				v_c	240	230	220	240	240	230	220		
TC..1103..	TCAW1103ZZ00727TL28	3	SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08	0,06		
				v_c	240	230	220	240	240	230	220		
	TCAW1103ZZ00627TR28		SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08	0,06		
				v_c	240	230	220	240	240	230	220		
TN..16T3..	TNAW16T3ZZ00414TL28	3	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
	TNAW16T3ZZ00314TR28		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
TN..1604..	TNAW1604ZZ00441TL28	3	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12			
				v_c	240	230	220	240	240	230			
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	TNAW1604ZZ00341TR28	3	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12			
				v_c	240	230	220	240	240	230			
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
TN..1606..	TNAW1606ZZ00449TL28	3	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12			
				v_c	240	230	220	240	240	230			
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	TNAW1606ZZ00349TR28	3	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12			
				v_c	240	230	220	240	240	230			
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						

insert		
TC..1102.R/L	08B.2538.7991	TX208
TC..1103.R/L	08B.2552.7991	TX208
TN..16T3.R/L	08B.0354.7991	TX208
TN..1604.R/L	08B.0364.7991	TX208
TN..1604.R/L*	08B.0375.7991	TX208
TN..1606.R/L	08B.3585.7991	TX215
TN..1606.R/L*	08B.3509.7991	TX215

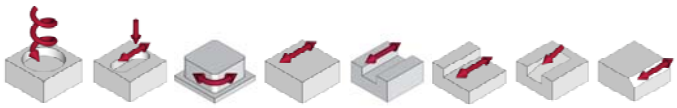
* attention to different screw lengths

» Assembly instructions page 115

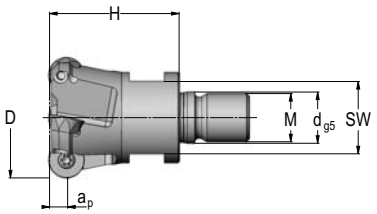


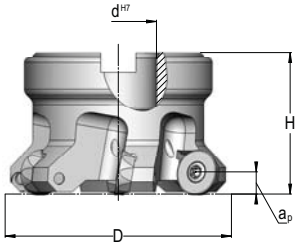
COPY MILLING CUTTER

Copy milling cutter RO18



< RDGX insert with facets prevents twisting and defines position while indexing
< axial and radial cutting edges guarantee a soft cut
< starting from Ø 20 mm





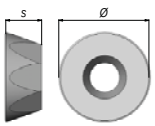
Copy milling cutter RO18 with thread

article	D	H	d_{g5}	M	SW	z_{eff}	a_p	ramp	ic	Kg	insert
18R.2028.001	20	28	10,5	10	15	2	5,0	▪	no	0,21	RD..10T3.N*
18R.2433.001	24	33	12,5	12	17	2	6,0	5,0°	no	0,21	RD..1204.N*
18R.3243.003	32	43	17,0	16	24	3	6,0	4,0°	no	0,21	RD..1204.N
18R.3243.004	32	43	17,0	16	24	4	5,0	4,0°	yes	0,22	RD..10T3.N
18R.4043.001	40	43	17,0	16	24	4	6,0	3,0°	no	0,25	RD..1204.N
18R.4043.002	40	43	17,0	16	24	3	6,0	3,0°	no	0,23	RD..1204.N

* attention to different screw lengths

Copy milling cutter RO18 cutter head

article	D	H	d^{H7}	z_{eff}	a_p	ramp	ic	Kg	insert
18R.5050.001	50	50	22	5	6,0	3,0°	yes	0,30	RD..1204.N
18R.5050.002	50	50	22	5	5,0	3,0°	yes	0,31	RD..10T3.N
18R.5250.001	52	50	22	5	6,0	3,0°	yes	0,35	RD..1204.N
18R.5250.002	52	50	22	6	5,0	3,0°	yes	0,35	RD..10T3.N
18R.6350.001	63	50	27	5	8,0	3,0°	yes	0,42	RD..1605.N
18R.6650.001	66	50	27	5	8,0	4,0°	yes	0,51	RD..1605.N
18R.6650.005	66	50	27	8	5,0	4,0°	yes	0,51	RD..10T3.N
18R.8050.002	80	50	27	6	8,0	3,0°	yes	0,96	RD..1605.N
18R.1050.002	100	50	32	7	8,0	3,0°	yes	1,49	RD..1605.N
18R.1263.001	125	63	40	8	8,0	2,0°	yes	2,91	RD..1605.N



insert	incircle diameter		insert thickness	
	ø 10 =	10,00	S T3 =	3,97
	ø 12 =	12,00	S 04 =	4,76
	ø 16 =	16,00	S 05 =	5,00

Allocation from machining parameters of AV material groups

	article	AS	grade	a_p at 1/4 from insert-Ø	cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
RD..10T3..	RDGX10T3M000210SN25	8	NERO^{2}43	f_z	0,5	0,35	0,3	0,4	0,35	0,3	0,25		
				v_c	280	260	250	280	260	250	240		
	RDGX10T3M000211TN28		SKY26	f_z	0,4	0,3	0,25						
				v_c	240	230	210						
	RDGX10T3M000214SN30		NERO^{2}43	f_z				0,3	0,3	0,25	0,25	0,2	0,2
				v_c				260	250	230	220	200	180
RD..1204..	RDGX1204M000110SN25	8	NERO^{2}43	f_z	0,5	0,35	0,3	0,45	0,4	0,35	0,3		
				v_c	280	260	250	280	260	250	240		
	RDGX1204M000111TN28		SKY26	f_z	0,4	0,3	0,25						
				v_c	240	230	210						
	RDGX1204M000114SN30		NERO^{2}43	f_z				0,3	0,3	0,25	0,25	0,2	0,2
				v_c				260	250	230	220	200	180
	RDGX1204M000113EN33		ICE43	f_z				0,25	0,25	0,2	0,2	0,15	0,15
				v_c				260	250	230	220	200	180
RD..1605..	RDGX1605M000110SN25	8	NERO^{2}43	f_z	0,5	0,35	0,3	0,5	0,45	0,4	0,35		
				v_c	280	260	250	280	260	250	240		
	RDGX1605M000111TN28		SKY26	f_z	0,4	0,3	0,25						
				v_c	240	230	210						
	RDGX1605M000114SN30		NERO^{2}43	f_z				0,3	0,3	0,25	0,25	0,2	0,2
				v_c				260	250	230	220	200	180

Allocation from machining parameters of AV material groups

	article	AS	grade	a_p at 1/4 from insert-Ø	stainless steel			titanium	aluminium
					C11	C10	C09	C08	E80
RD..10T3..	RDGX10T3M000210SN25	8	NERO^{2}43	f_z					
				v_c					
	RDGX10T3M000211TN28		SKY26	f_z					
				v_c					
	RDGX10T3M000214SN30		NERO^{2}43	f_z	0,2	0,15	0,1	0,1	0,3
				v_c	130	120	110	60-70	250-650
RD..1204..	RDGX1204M000110SN25	8	NERO^{2}43	f_z					
				v_c					
	RDGX1204M000111TN28		SKY26	f_z					
				v_c					
	RDGX1204M000114SN30		NERO^{2}43	f_z	0,2	0,15	0,1	0,1	0,35
				v_c	130	120	110	60-70	250-650
	RDGX1204M000113EN33		ICE43	f_z	0,2	0,15	0,1		0,35
				v_c	10	110	100		250-650
RD..1605..	RDGX1605M000110SN25	8	NERO^{2}43	f_z					
				v_c					
	RDGX1605M000111TN28		SKY26	f_z					
				v_c					
	RDGX1605M000114SN30		NERO^{2}43	f_z	0,2	0,15	0,1	0,1	0,35
				v_c	130	120	110	60-70	250-650

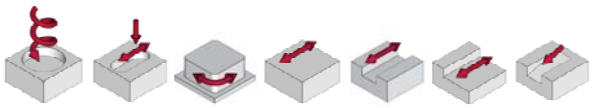
f_z adjustment at different a_p values												
a_p	0,5	1	1,5	2	2,5	3	3,5	4	5	6	7	8
RD 10	2,00	1,50	1,25	1,10	1,00	0,95	0,90	0,85	0,90			
RD 12	2,10	1,50	1,30	1,15	1,10	1,00	0,95	0,90	0,85	0,85		
RD 16	2,40	1,80	1,50	1,30	1,20	1,10	1,05	1,00	0,95	0,90	0,85	0,85

insert		
RD..10T3.N	08B.0375.7991	TX208
RD..10T3.N*	08B.0363.7991	TX208
RD..1204.N	08B.3509.7991	TX215
RD..1204.N*	08B.3578.7991	TX215
RD..1605.N	08B.0513.7991	TX220

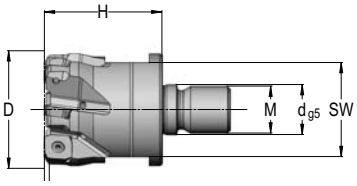
* attention to different screw lengths

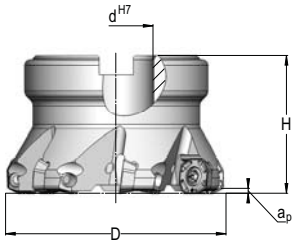
» Technical information for ramp page 109
» Technical information for f_z adjustment page 109

Primavant UP90



< HPC-milling cutter for highest rate of metal removal
< 4 edge insert UE allows 90 degree shoulder machining
< ideal for pocket milling





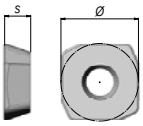
Primavant UP90 with thread

article	D	H	d_{g5}	M	SW	z_{eff}	a_p	ramp	wedge	ic	Kg	insert
18U.3240.031	32	40	17	16	22	4	1,0	4,0°	no	yes	0,19	UE..0903.R
18U.3540.032	35	40	17	16	27	4	1,0	4,0°	no	yes	0,21	UE..0903.R
18U.4040.032	40	40	17	16	32	5	1,0	3,0°	no	yes	0,31	UE..0903.R
18U.4040.041	40	40	17	16	32	4	2,0	4,0°	no	yes	0,29	UE..1204.R

Primavant UP90 cutter head

article	D	H	d^{H7}	z_{eff}	a_p	ramp	wedge	ic	Kg	insert
18U.5050.031	50	50	22	7	1,0	3,5°	no	yes	0,41	UE..0903.R
18U.5050.041	50	50	22	5	2,0	4,0°	no	yes	0,38	UE..1204.R
18U.6350.031	63	50	22	7	1,0	2,0°	no	yes	0,73	UE..0903.R
18U.6350.041	63	50	22	6	2,0	2,5°	no	yes	0,65	UE..1204.R
18U.8050.041	80	50	27	7	2,0	1,8°	no	yes	1,04	UE..1204.R
18U.1050.052	100	50	32	9	2,0	▪	no	yes	1,57	UE..1204.R
18U.1050.001	100	50	32	7	2,5	▪	yes	no	1,59	UE..1506.R
18U.1263.001	125	63	40	8	2,5	▪	yes	no	2,64	UE..1506.R
18U.1663.001	160	63	40	10	2,5	▪	yes	no	4,54	UE..1506.R

set wedge				insert
08Z.0000.127	08K.0808.001	08Z.0000.010	TX208	UE..0903/UE..1204
08Z.0000.063	08K.1108.001	08Z.0000.010	TX220	UE..1506



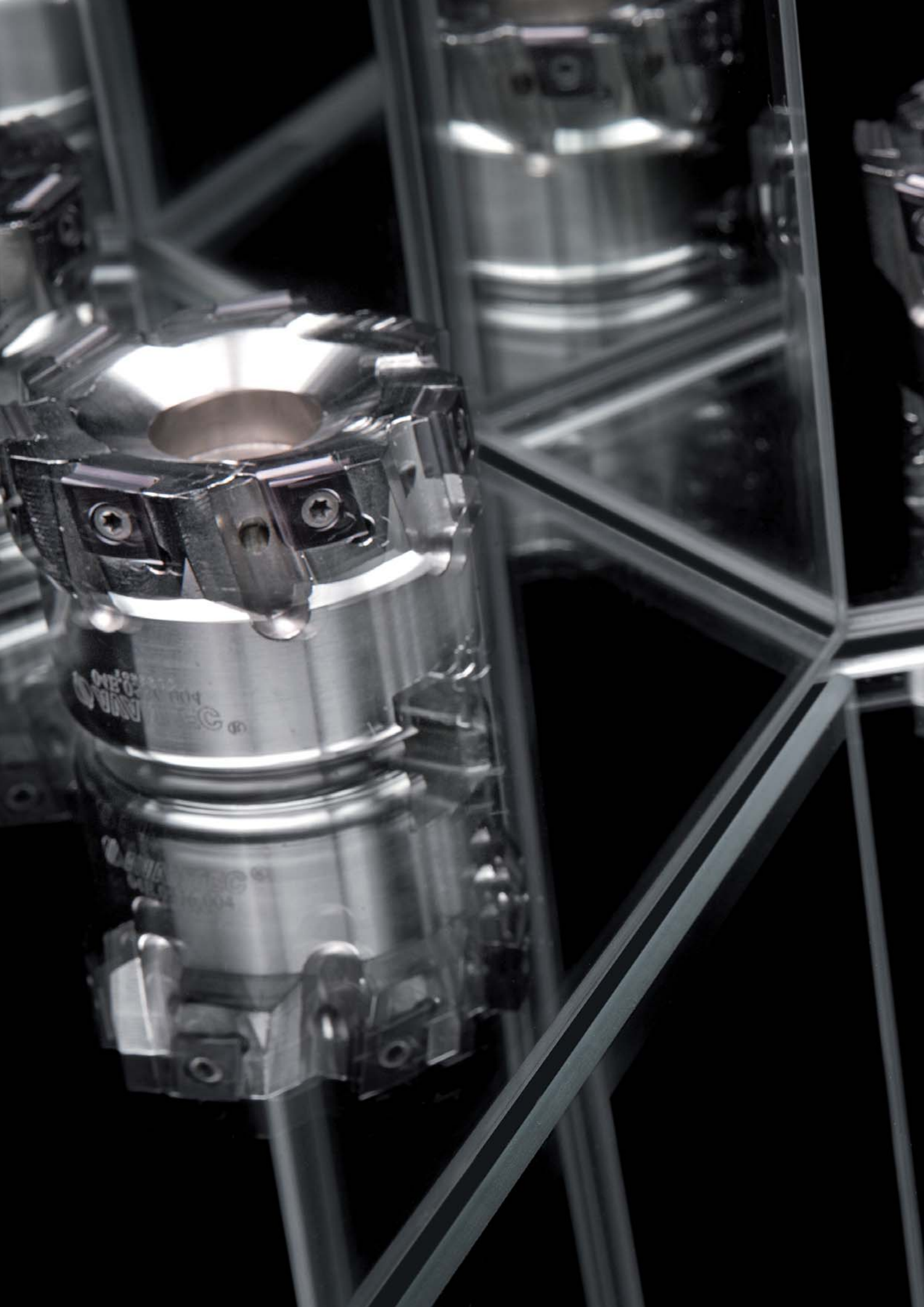
insert	incircle diameter		insert thickness	
	ø 09 =	9,52	S 03 =	3,20
	ø 12 =	12,70	S 04 =	4,76
	ø 15 =	15,90	S 06 =	6,35

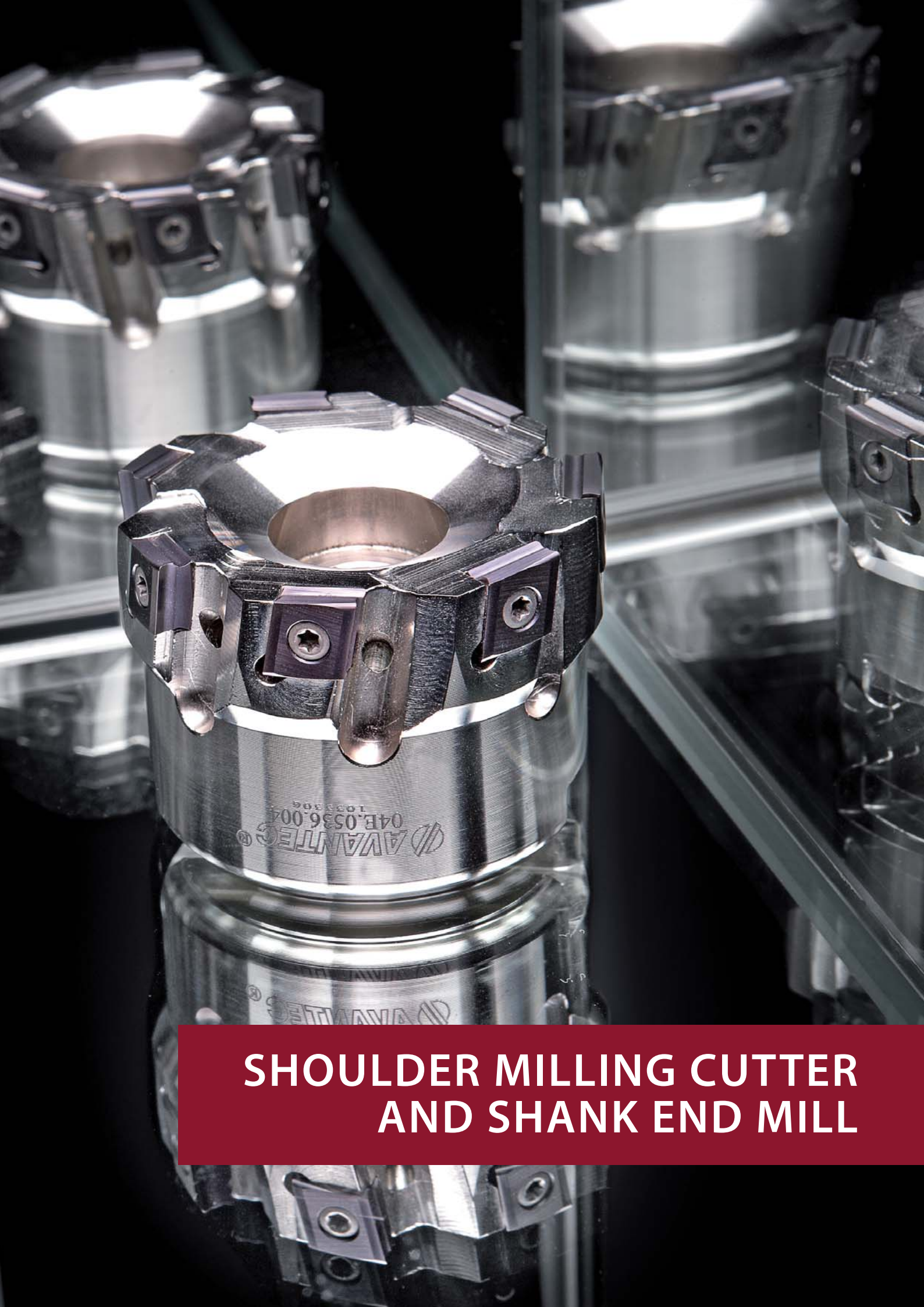
Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
UE..0903..	UEGW09031001610SR25	4	NERO^{2}77	f_z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	
				v_c	280	260	250	280	260	250	240	220	
	UEGW09031001611TR28	4	NERO^{2}77	f_z	1,6	1,3	0,8	1,6	1,6	1,3	1,3	1	
				v_c	280	260	250	280	260	250	240	220	
			ICE^{2}43	f_z	1,6	1,3	0,8	1,6	1,6	1,3	1,3	1	
				v_c	260	250	230	260	250	230	220	200	
	UEGT09031021601TR25		SKY77	f_z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	1
				v_c	260	250	240	260	250	240	220	200	180
			NERO^{2}43	f_z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	1
				v_c	280	260	250	280	260	250	240	220	200
UE..1204..	UEGW12041001610SR25	4	NERO^{2}77	f_z	2	1,6	1	2	2	1,5	1,5	1,2	1
				v_c	280	260	250	280	260	250	240	220	200
	UEGW12041001611TR28		NERO^{2}77	f_z	1,8	1,4	0,8	1,8	1,8	1,4	1,4	1	0,8
				v_c	280	260	250	280	260	250	240	220	200
			ICE^{2}43	f_z	1,8	1,4	0,8	1,8	1,8	1,4	1,4	1	0,8
				v_c	260	250	230	260	250	230	220	200	180
	UEGT12041021601TR25		SKY77	f_z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	1
				v_c	260	250	240	260	250	240	220	200	180
			NERO^{2}43	f_z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	1
				v_c	280	260	250	280	260	250	240	220	200
UE..1506..	UEGW15061001410SR25	4	NERO^{2}77	f_z	2,5	2	1,5	2,5	2,5	2	2	1,5	1,2
				v_c	280	260	250	280	260	250	240	220	200
	UEGW15061001411TR28		NERO^{2}77	f_z	2	1,6	1	2	2	1,5	1,5	1,2	1
				v_c	280	260	250	280	260	250	240	220	200
			ICE^{2}77	f_z	2	1,6	1	2	2	1,5	1,5	1,2	1
				v_c	260	250	230	260	250	230	220	200	180

insert		
UE..0903.R	08B.0364.7991	TX208
UE..1204.R	08B.0411.7991	TX215
UE..1506.R	08B.4511.7991	TX220

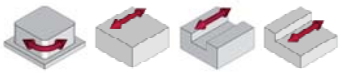
»Technical information for ramp page 109
» Information for "theoretical corner radius" Primavant UP90 page 110



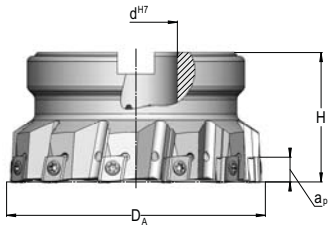


SHOULDER MILLING CUTTER AND SHANK END MILL

Shoulder milling cutter EP90/EV90



< highest brake resistance because of tangential build in 4 cutting edge EN insert
< high DOC and high feed rates at once
< EV90: fine pitch brings advantage for cast iron machining

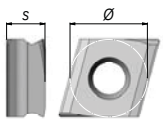


Shoulder milling cutter EP90

article	D	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
04E.0432.001	40	32	16	5	7,5	yes	0,18	EN..08T3.L
04E.0536.001	50	36	22	5	9,0	yes	0,31	EN..0904.L
04E.0640.005	63	40	22	5	12,0	yes	0,52	EN..1206.L
04E.0850.001	80	50	27	7	12,0	yes	1,06	EN..1206.L
04E.1050.001	100	50	32	8	12,0	yes	1,76	EN..1206.L
04E.1263.001	125	63	40	10	12,0	yes	3,13	EN..1206.L

Shoulder milling cutter EV90

article	D	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
04E.0432.002	40	32	16	6	7,5	yes	0,20	EN..08T3.L
04E.0536.004	50	36	22	7	7,5	yes	0,32	EN..08T3.L
04E.0640.001	63	40	22	7	9,0	yes	0,54	EN..0904.L
04E.0640.006	63	40	22	9	7,5	yes	0,57	EN..08T3.L
04E.0850.004	80	50	27	10	9,0	yes	1,09	EN..0904.L
04E.0850.016	80	50	27	12	7,5	yes	1,12	EN..08T3.L
04E.1050.003	100	50	32	12	9,0	yes	1,77	EN..0904.L
04E.1050.004	100	50	32	12	12,0	yes	1,82	EN..1206.L
04E.1263.003	125	63	40	13	9,0	yes	3,16	EN..0904.L
04E.1263.007	125	63	40	15	12,0	yes	3,16	EN..1206.L



insert	incircle diameter		insert thickness	
	ø 08 =	8,00	S T3 =	3,97
	ø 09 =	9,52	S 04 =	4,76
	ø 12 =	12,70	S 06 =	6,35

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENHQ08T30601209SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601726SL28V	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30600154SL30	4	SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		
	ENHQ08T30600156EL33	4	DELPH43	h_{max}					0,1	0,09	0,08	0,08	0,07
				v_c					180	150	100	90	80
			ICE43	h_{max}					0,1	0,09	0,08	0,08	0,07
				v_c					180	150	100	90	80
	ENFQ08T30603101EL33S*	1	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
EN..0904..	ENHQ09040802312SL28W	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040801726SL28V	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040800354SL30	4	SKY77	h_{max}				0,13	0,12	0,1	0,08	0,08	0,07
				v_c				180	160	130	100	90	80
	ENHQ09040800356EL33	4	DELPH43	h_{max}						0,08	0,06	0,06	0,05
				v_c						130	100	90	80
			ICE43	h_{max}						0,08	0,06	0,06	0,05
				v_c						130	100	90	80
	ENFQ09040803302EL33S*	1	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		

* wiper insert, only one insert per tool required. Only in combination with geometry -28W.

Allocation from machining parameters of AV material groups

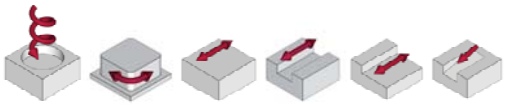
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..1206..	ENHQ12061002718SL25V	4	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,25	0,2	0,18						
				v_c	280	270	260						
			CAN^{2}77	h_{max}	0,25	0,2	0,18						
				v_c	400	380	360						
	ENHQ12061002913SL28W	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			NERO26	h_{max}	0,22	0,2	0,18						
				v_c	280	270	260						
	ENHQ12061000352SL28	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18	0,15		
				v_c	240	230	220	240	240	230	210		
	ENHQ12061000354SL30	4	SKY77	h_{max}	0,18	0,15	0,14	0,18	0,16	0,15	0,12		
				v_c	240	230	220	240	230	220	180		
	ENFQ12061003501EL33S*	1	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			

* wiper insert, only one insert per tool required. Only in combination with geometry -28W.

insert		
EN..08T3.L	08B.0309.7991	TX208
EN..0904.L	08B.3509.7991	TX215
EN..1206.L	08B.0513.7991	TX220

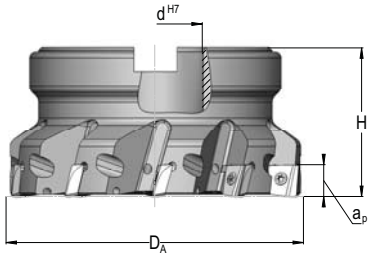
» Assembly instructions page 114

Megavant HC90



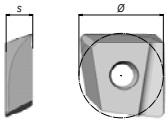
< specially qualified to machine difficult materials (stainless, titanium etc.)

< high feed rates and DOC for the 90 degree shoulder machining



Megavant HC90

article	D	H	d^{H7}	z_{eff}	a_p	ramp	ic	Kg	insert
04M.0432.150	40	32	16	5	8,0	1,0°	yes	0,16	MO..1003.R
04M.0540.150	50	40	22	6	8,0	0,8°	yes	0,32	MO..1003.R
04M.0540.080	50	40	22	6	10,0	1,1°	yes	0,32	MO..12T3.R
04M.0640.080	63	40	22	7	10,0	0,8°	yes	0,50	MO..12T3.R
04M.0850.080	80	50	27	9	10,0	0,6°	yes	1,03	MO..12T3.R
04M.1050.080	100	50	32	10	10,0	0,5°	yes	1,70	MO..12T3.R



insert	incircle diameter		insert thickness	
	ø 10 =	10,00	S 03 =	3,60
	ø 12 =	12,70	S T3 =	4,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
MO..1003..	MOGU10031003104TR28	2	SKY77	h_{max}	0,18	0,15	0,14	0,18	0,16	0,15	0,12	0,1	0,08
				v_c	240	230	220	240	230	220	180	160	140
MO..12T3..	MO.12T3.081.01TR28	2	SKY77	h_{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			AV1077	h_{max}				0,18	0,16	0,15	0,12	0,1	0,08
				v_c				240	230	220	180	160	140
	MOGU12T31008102TR30		ICE^{2}77	h_{max}	0,16	0,13	0,11	0,16	0,15	0,13	0,11	0,1	0,08
				v_c	240	230	220	240	230	220	180	160	140
	MOGU12T31008103SR30		DELPH43	h_{max}				0,16	0,15	0,13	0,11	0,1	0,08
				v_c				240	230	220	180	160	140

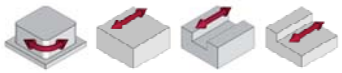
Allocation from machining parameters of AV material groups

	article	AS	grade		stainless steel			titanium	aluminium
					C11	C10	C09	C08	E80
MO..1003..	MOGU10031003104TR28	2	SKY77	h_{max}				0,08	0,15
				v_c				60-70	250-650
MO..12T3..	MO.12T3.081.01TR28	2	SKY77	h_{max}				0,1	0,3
				v_c				60-70	250-650
			AV1077	h_{max}					
				v_c					
	MOGU12T31008102TR30		ICE^{2}77	h_{max}	0,1	0,08	0,07	0,08	0,25
				v_c	100	90	80	60-70	250-650
	MOGU12T31008103SR30		DELPH43	h_{max}	0,1	0,08	0,07	0,08	0,25
				v_c	100	90	80	60-70	250-650

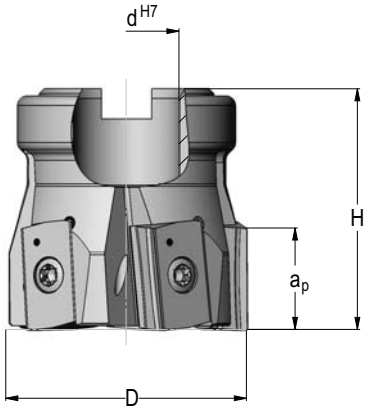
insert		
MO..1003.R	08B.0309.001	TX208
MO..12T3.R	08B.0309.001	TX208

»Technical information for ramp page 109

Shoulder milling cutter LN90



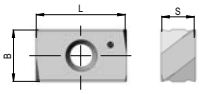
< extremely high depth of cut depending on insert size in 90 degree machining
< enormous stability due to robust inserts
< excellent roughing and finishing surface quality



Shoulder milling cutter LN90

article	D	H	d^{H7}	z_{eff}	a_p	ic	Kg	insert
04L.0550.003	50	50	22	5	20,0	yes	0,52	LN..2208..L
04L.0650.005	63	50	22	6	20,0	yes	0,84	LN..2208..L
04L.0850.005	80	50	27	8	20,0	yes	1,33	LN..2208..L
04L.1050.005	100	50	32	10	20,0	yes	2,05	LN..2208..L
04L.1263.005	125	63	40	13	20,0	yes	3,54	LN..2208..L
04L.0540.030	50	40	22	6	10,0	yes	0,37	LN..1208..L*
04L.0640.030	63	40	22	7	10,0	yes	0,57	LN..1208..L*
04L.0850.030	80	50	27	10	10,0	yes	1,11	LN..1208..L
04L.1050.030	100	50	32	12	10,0	yes	1,82	LN..1208..L
04L.1263.030	125	63	40	15	10,0	yes	3,43	LN..1208..L
04L.1663.030	160	63	40	18	10,0	yes	4,55	LN..1208..L

* attention to different screw lengths



insert | **incircle diameter**

B = ø 12,50
L = ø 11,20
L = ø 22,00

insert thickness

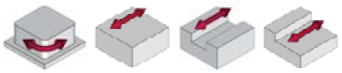
S = 8,00

Allocation from machining parameters of AV material groups

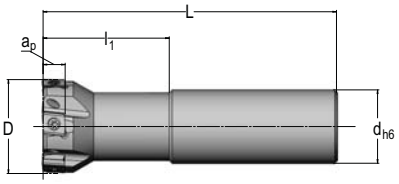
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
LN..1208..	LNHQ12081000201TL28S	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			CAN^{2}77	h_{max}	0,25	0,2	0,18						
				v_c	360	340	320						
LN..2208..	LNHQ22080500301SL28	4	SKY77	h_{max}	0,22	0,2	0,18	0,22	0,2	0,18			
				v_c	240	230	220	240	230	220			
			CAN^{2}77	h_{max}	0,25	0,2	0,18						
				v_c	360	340	320						

insert		
LN..1208..L	08B.0416.7991	TX215
LN..1208..L*	08B.0412.7991	TX215
LN..2208..L	08B.0513.7991	TX220

Shank end mill CS90

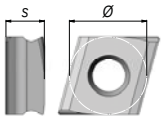


< highest break resistance because of tangential build in 4 cutting edge CN insert
< guaranteed 4 cutting edges in case of smaller CN insert
< high DOC and high feed rates at once
< fine pitch brings advantage for cast iron machining



Shank end mill CS90

article	D	l_1	d_{h6}	L	z_{eff}	a_p	ic	Kg	insert
11C.2509.001	25	31,5	25	90	4	7,0	yes	0,30	CN..07T3.L
11C.3210.001	32	43,0	25	100	5	7,0	yes	0,37	CN..07T3.L
11C.4011.001	40	48,5	32	110	6	7,0	yes	0,67	CN..07T3.L

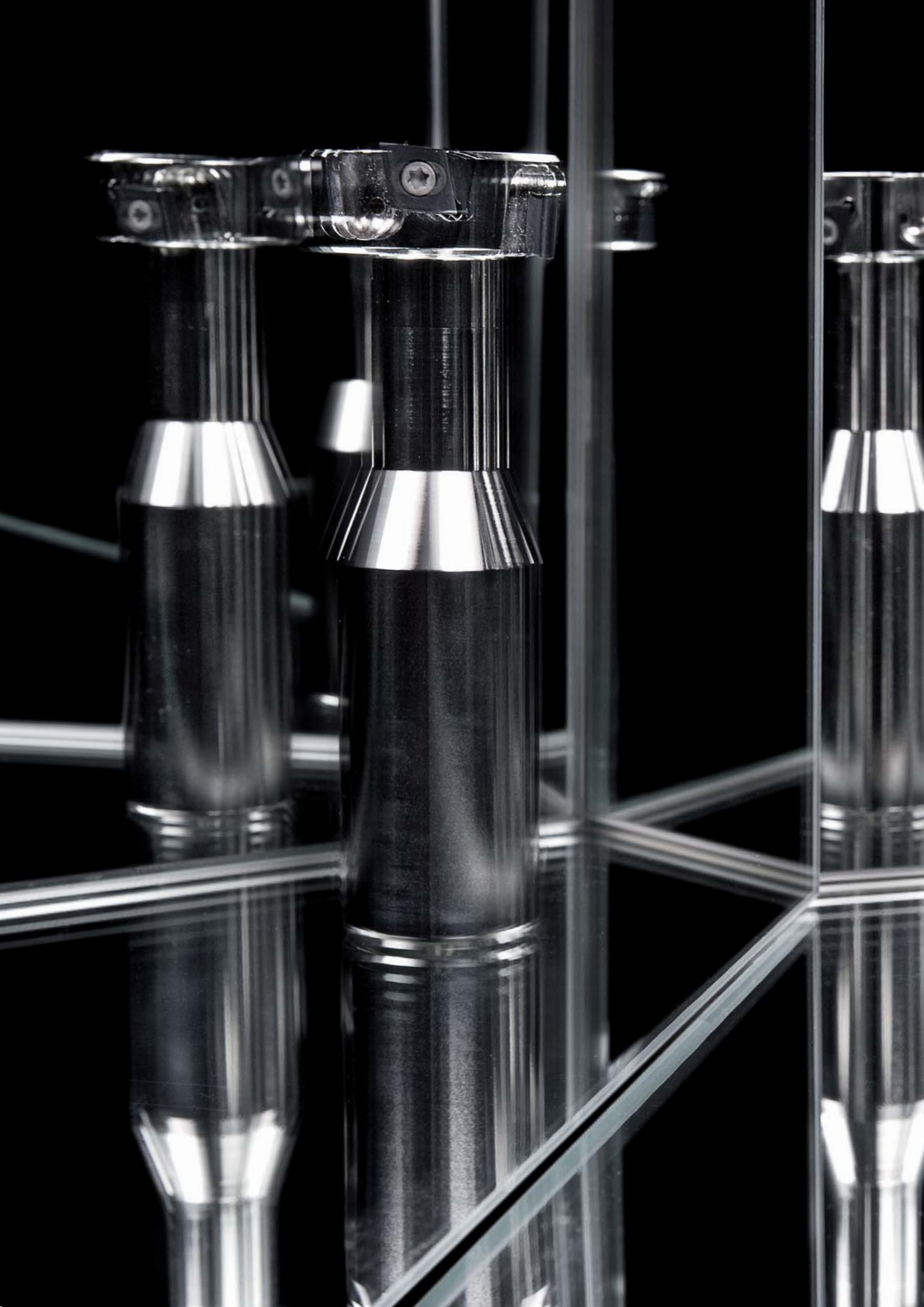


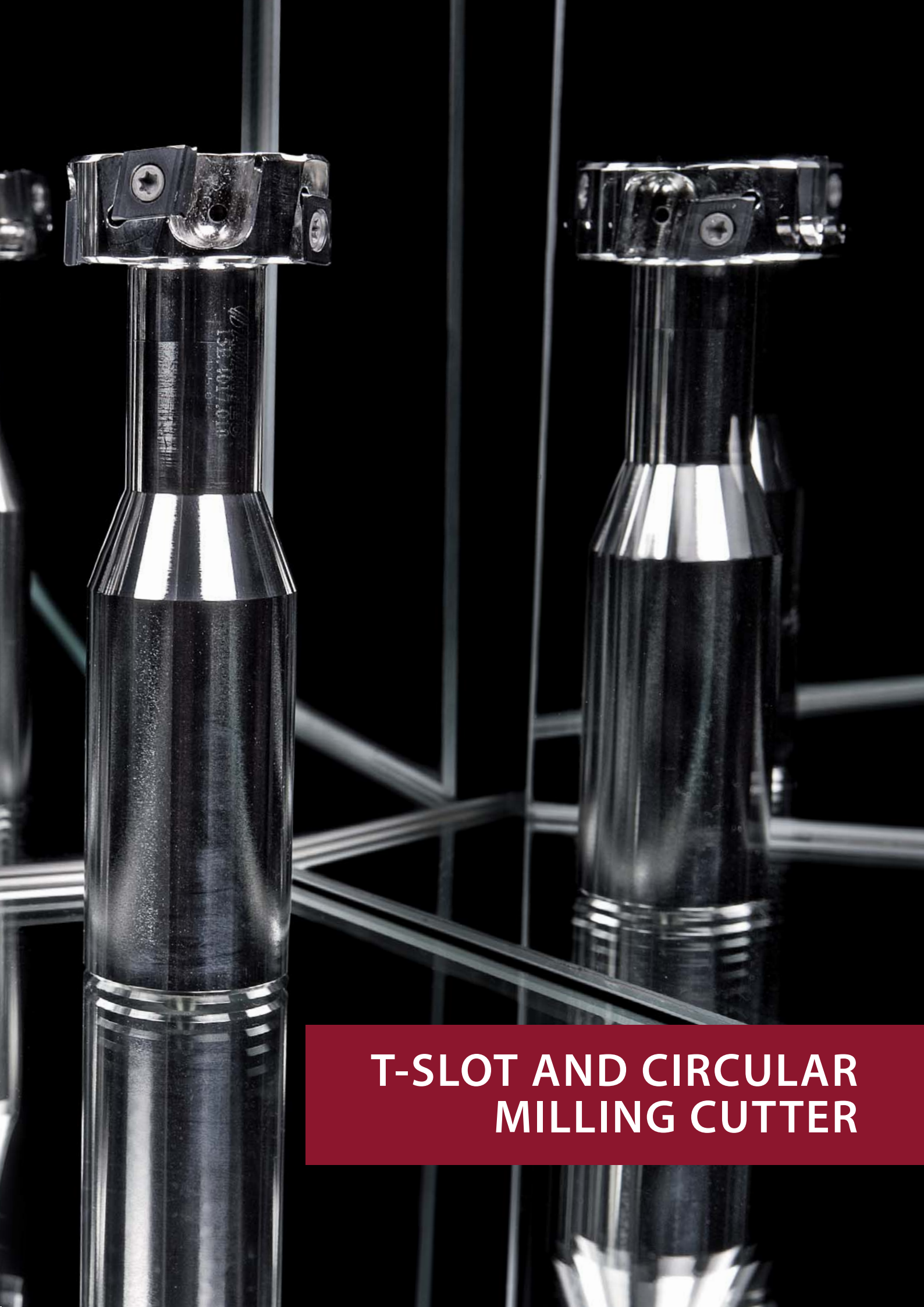
insert | **incircle diameter** ø 07 = 7,50 | **insert thickness** S T3 = 4,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
CN..07T3..	CNHQ07T30600811SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
			NERO^{2}77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	220	200	240	220	200	180		

insert		
CN..07T3.L	08B.0309.7991	TX208

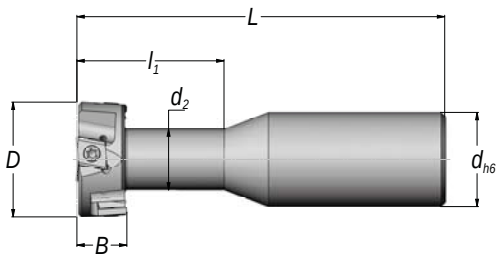




T-SLOT AND CIRCULAR MILLING CUTTER

T-slot milling cutter ET90

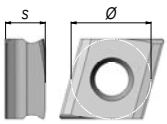
< 4 cutting edge EN insert
< high performance slotting cutter following DIN 650 parameters
< tangential insert style enables optimal chip removal



T-slot milling cutter ET90

article	D	d_2	B	L	l_1	d_{h6}	zz	z_{eff}	ic	Kg	insert
15E.3213.010	32	16,8	13	115	39	32	2 x 2	2	yes	0,51	EN..08T3.R/L
15E.4017.010	40	20,8	17	125	50	32	2 x 2	2	yes	0,65	EN..0904.R/L
15E.4821.010	48	26,0	21	135	60	32	2 x 3	2	yes	0,80	EN..08T3.R/L

smaller diameter see page 90-91



insert	incircle diameter		insert thickness	
ø 08 =	8,00		S T3 =	3,97
ø 09 =	9,52		S 04 =	4,76

Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENHQ08T30601209SL28W	4	SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601409SR28W		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601726SL28V		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30601626SR28V		SKY77	h_{max}	0,15	0,12	0,1	0,15	0,15	0,12	0,1		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,15	0,12	0,1						
				v_c	280	270	260						
	ENHQ08T30600154SL30		SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		
	ENHQ08T30600254SR30		SKY77	h_{max}	0,1	0,09	0,08	0,1	0,1	0,09	0,08		
				v_c	240	230	220	240	240	230	220		

Allocation from machining parameters of AV material groups

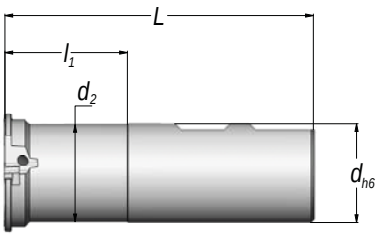
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..0904..	ENHQ09040802312SL28W	4	SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040802212SR28W		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040801726SL28V		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040801626SR28V		SKY77	h_{max}	0,18	0,15	0,12	0,18	0,15	0,13	0,11		
				v_c	240	230	220	240	240	230	220		
			NERO26	h_{max}	0,18	0,15	0,12						
				v_c	280	270	260						
	ENHQ09040800354SL30		SKY77	h_{max}				0,13	0,12	0,1	0,08	0,08	0,07
				v_c				180	160	130	100	90	80
	ENHQ09040800254SR30		SKY77	h_{max}				0,13	0,12	0,1	0,08	0,08	0,07
				v_c				180	160	130	100	90	80

insert		
EN..08T3.R/L	08B.0309.7991	TX208
EN..0904.R/L	08B.3509.7991	TX215

» Assembly instructions page 114

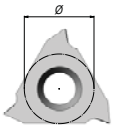
Circular milling cutter TZ18

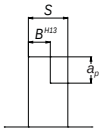
< standard for all retaining ring grooves
< three sided embedding for circular insert
< precision slotting is possible



Circular milling cutter TZ18

article	D	d_2	L	l_1	d_{h6}	z_{eff}	a_p	ic	Kg	insert
13T.2510.001	25	20,5	100	40	25	3	1,4 - 2,2	yes	0,31	TC..1103.R
13T.4011.001	40	31,5	100	39	32	3	2,2 - 3,2	yes	0,61	TN..1604.R





insert				
article	Ø	B	a_p	S
TCAX11031603006TR25	6,35	1,60	1,40	3,20
TCAX11031803005TR25	6,35	1,85	1,70	3,20
TCAX11032103004TR25	6,35	2,15	2,00	3,20
TCAX11032603003TR25	6,35	2,65	2,20	3,20
TNAX16042601801TR25	9,52	2,65	2,20	4,76
TNAX16043201802TR25	9,52	3,15	2,20	4,76
TNAX16044101803TR25	9,52	4,15	3,20	4,76

Allocation from machining parameters of AV material groups

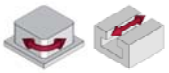
					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
TC..1103..	TCAX11031603006TR25	3	SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,07	0,06		
				v_c	240	230	220	240	240	230	220		
	TCAX11031803005TR25		SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,07	0,06		
				v_c	240	230	220	240	240	230	220		
	TCAX11032103004TR25		SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,07	0,06		
				v_c	240	230	220	240	240	230	220		
	TCAX11032603003TR25		SKY77	h_{max}	0,08	0,07	0,06	0,08	0,08	0,07	0,06		
				v_c	240	230	220	240	240	230	220		
TN..1604..	TNAX16042601801TR25	3	SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08			
				v_c	240	230	220	240	240	230			
	TNAX16043201802TR25		SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08			
				v_c	240	230	220	240	240	230			
	TNAX16044101803TR25		SKY77	h_{max}	0,1	0,08	0,07	0,1	0,1	0,08			
				v_c	240	230	220	240	240	230			

insert		
TC..1103.R	08B.2506.7991	TX208
TN..1604.R	08B.0375.7991	TX208

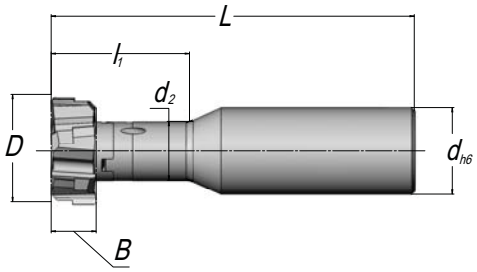
» Assembly instructions page 115

PROGRAMS

Avant-Easy-Change
T-slot milling cutter ETC90



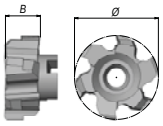
< high performance slotting cutter following DIN 650 parameters
< form and force locking cross and/or diamond pull-in step guarantees smooth running
< maximum replacement accuracy



Avant-Easy-Change T-slot milling cutter ETC90

article	D	d_2	B	L	l_1	d_{h6}	z_{eff}	ic	Kg	insert
20G.20.1112.01	20	11	8,5	96	30	20	3	yes	0,18	ECT2008.R
20G.20.1313.01	24	13	10	100	35	20	3	yes	0,20	ECT2410.R
20G.25.1713.01	31	17	13	105	40	25	3	yes	0,37	ECT3113.R

larger diameter see page 82-83



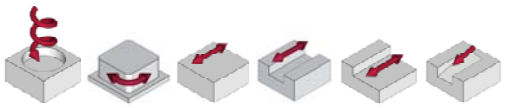
insert	incircle diameter	insert thickness
	ø 20 = 20,00	B 08 = 8,50
	ø 24 = 24,00	B 10 = 10,00
	ø 31 = 31,00	B 13 = 13,00

Allocation from machining parameters of AV material groups

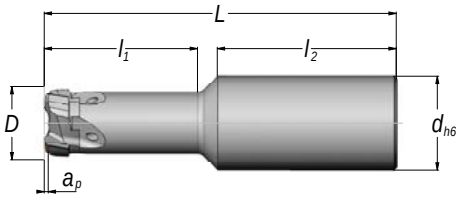
					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
ECT2008..	ECT2008083201TR25	3	SKY77	h_{max}	0,1	0,08	0,05	0,1	0,1	0,08	0,05		
				v_c	180	170	160	180	180	170	160		
ECT2410..	ECT2410103301TR25	3	SKY77	h_{max}	0,1	0,08	0,05	0,1	0,1	0,08	0,05		
				v_c	180	170	160	180	180	170	160		
ECT3113..	ECT3113123301TR25	3	SKY77	h_{max}	0,1	0,08	0,05	0,1	0,1	0,08	0,05		
				v_c	180	170	160	180	180	170	160		

insert		
ECT2008.R	08B.3514.7991	TX215
ECT2410.R	08B.0520.7991	TX220
ECT3113.R	08B.0520.7991	TX220

Avant-Easy-Change Turbavant SP18

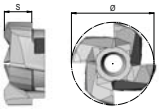


< HPC- cutter as indexable insert system
< optimal power transmission by form and force locking cross and/or diamond pull-in step
< constant accuracy while indexing
< stable design



Avant-Easy-Change Turbavant SP18

article	D	d_{h6}	L	l_1	l_2	z_{eff}	a_p	ramp	ic	Kg	insert
20G.20.1412.01	16	20	80	27	50	4	0,8	1,2°	yes	0,15	ECK1612.R
20G.20.1422.01	16	20	95	42	50	4	0,8	1,2°	yes	0,17	ECK1612.R
20G.20.1432.01	16	20	120	67	50	4	0,8	1,2°	yes	0,20	ECK1612.R
20G.32.2125.01	25	32	120	52	61	4	0,8	2,1°	yes	0,53	ECK2512.R
20G.32.2135.01	25	32	150	82	61	4	0,8	2,1°	yes	0,61	ECK2512.R



insert | **incircle diameter**
ø 16 = 16,00
ø 25 = 25,00

insert thickness
S 12 = 12,00

Allocation from machining parameters of AV material groups

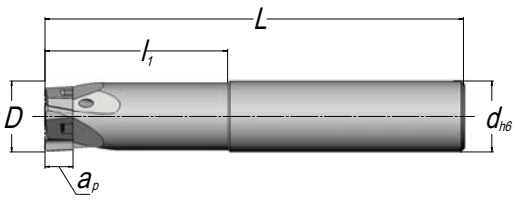
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
ECK1612..	ECK1612104202TR25	4	SKY77	h_{max}	0,8	0,6	0,5	0,8	0,7	0,6	0,5		
				v_c	240	230	220	240	240	230	220		
ECK2512..	ECK2512104501TR25	4	SKY77	h_{max}	0,8	0,6	0,5	0,8	0,7	0,6	0,5		
				v_c	240	230	220	240	240	230	220		

insert		
ECK1612.R	08B.3512.7991	TX215
ECK2512.R	08B.0520.7991	TX220

»Technical information for ramp page 109
» Information for "theoretical corner radius" Turbavant SP18 page 110

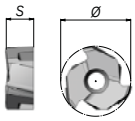
Avant-Easy-Change Shank end mill TS90

< alternative for full carbide end mills by small DOC
< perfect match of insert groove and drive keys
< optimal power transmission by form and force locking cross and/or diamond pull-in step guarantees highest balance



Avant-Easy-Change Shank end mill TS90

article	D	L	l_1	d_{h6}	z_{eff}	a_p	ic	Kg	insert
20G.14.1412.01	14	75,0	18	14	3	6,0	no	0,10	ECE1406.R
20G.16.1612.01	16	82,0	22	16	3	6,0	no	0,12	ECE1606.R
20G.18.1813.01	18	84,0	23	18	3	8,0	yes	0,15	ECE1808.R
20G.20.2013.01	20	92,0	26	20	3	8,0	yes	0,20	ECE2008.R
20G.14.1432.01	14	93,1	36	14	3	6,0	yes	0,10	ECE1406.R
20G.16.1632.01	16	104,1	44	16	3	6,0	yes	0,14	ECE1606.R
20G.18.1833.01	18	108,0	47	18	3	8,0	yes	0,20	ECE1808.R
20G.20.2033.01	20	118,0	52	20	3	8,0	yes	0,26	ECE2008.R



insert	incircle diameter		insert thickness		
	ø 14 =	14,00	S 06	=	6,00
	ø 16 =	16,00	S 08	=	8,00
	ø 18 =	18,00			
	ø 20 =	20,00			

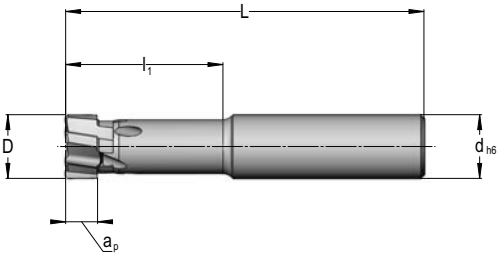
Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
ECE1406..	ECE1406063201TR25	3	SKY77	h_{max}	0,16	0,14	0,12	0,16	0,15	0,13	0,12		
				v_c	240	230	220	240	240	230	220		
ECE1606..	ECE1606083201TR25	3	SKY77	h_{max}	0,18	0,16	0,13	0,18	0,16	0,14	0,13		
				v_c	240	230	220	240	240	230	220		
ECE1808..	ECE1808083301TR25	3	SKY77	h_{max}	0,2	0,18	0,14	0,2	0,2	0,18	0,14		
				v_c	240	230	220	240	240	230	220		
ECE2008..	ECE2008103301TR25	3	SKY77	h_{max}	0,2	0,18	0,14	0,2	0,2	0,18	0,14		
				v_c	240	230	220	240	240	230	220		

insert		
ECE1406.R	08B.3511.7991	TX215
ECE1606.R	08B.3511.7991	TX215
ECE1808.R	08B.0516.7991	TX220
ECE2008.R	08B.0516.7991	TX220

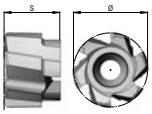
Avant-Easy-Change Shank end mill XS90

< variable in diameter and pitch
< optimal power transmission by form and force locking
cross and/or diamond pull-in step
< constant accuracy while indexing



Avant-Easy-Change Shank end mill XS90

article	D	L	l_1	d_{h6}	z_{eff}	a_p	ic	Kg	insert
20G.16.1327.10	16	90,0	40	16	6	8,0	yes	0,12	ECE1612.R
20G.20.1624.10	20	100,0	48	20	8	10,0	yes	0,24	ECE2014.R
20G.25.2013.01	25	120,0	30	25	5	8,5	yes	0,42	ECE2512.R
20G.25.2033.01	25	130,0	71	25	5	8,5	yes	0,39	ECE2512.R
20G.25.2126.10	25	110,0	53	25	8	12,5	yes	0,36	ECE2516.R
20G.32.2526.10	28	120,0	58	32	8	15,0	yes	0,62	ECE2818.R



insert	incircle diameter		insert thickness		
	ø 16 =	16,00	S 12	=	12,00
	ø 20 =	20,00	S 14	=	14,00
	ø 25 =	25,00	S 16	=	16,00
	ø 28 =	28,00	S 18	=	18,50

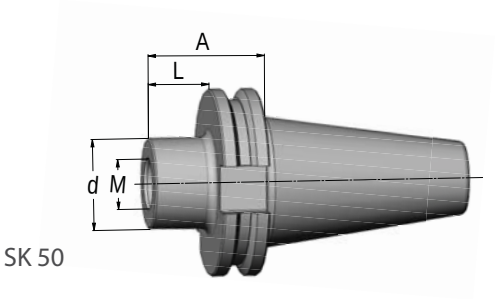
Allocation from machining parameters of AV material groups

					cast iron			steel					
	article	AS	grade		D20	D18	D17	A22	A20	A18	A16	B15	B14
ECE1612..	ECE1612106710TR28	6	SKY77	h_{max}	0,16	0,14	0,12	0,16	0,15	0,13	0,12		
				v_c	240	230	220	240	240	230	220		
ECE2014..	ECE2014108410TR28	8	SKY77	h_{max}	0,18	0,16	0,13	0,18	0,16	0,14	0,13		
				v_c	240	230	220	240	240	230	220		
ECE2512..	ECE2512105302TR25	5	SKY77	h_{max}	0,2	0,18	0,14	0,2	0,2	0,18	0,14		
				v_c	240	230	220	240	240	230	220		
ECE2516..	ECE2516108610TR28	8	SKY77	h_{max}	0,2	0,18	0,14	0,2	0,2	0,18	0,14		
				v_c	240	230	220	240	240	230	220		
ECE2818..	ECE2818108610TR28	8	SKY77	h_{max}	0,2	0,18	0,14	0,2	0,2	0,18	0,14		
				v_c	240	230	220	240	240	230	220		

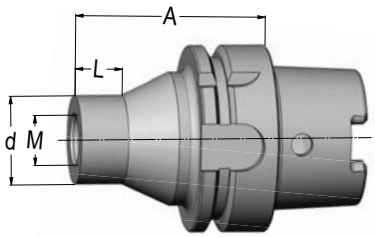
insert		
ECE1612.R	08B.0416.7991	TX215
ECE2014.R	08B.0520.7991	TX220
ECE2512.R	08B.0520.7991	TX220
ECE2516.R	08B.0627.7991	TX225
ECE2818.R	08B.0627.7991	TX225

Triloc shank

< stable connection, specially for long overhangs
< extremely accurate control of radial run out
< vibration damped system available
< safer and faster machining



SK 50



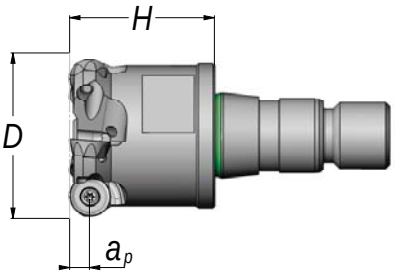
HSK 63

Shanks for Triloc program

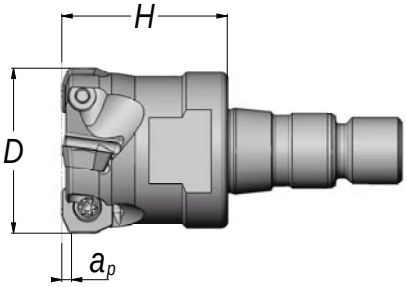
	article	d	L	M	A	Kg
SK50	09C.5018.160	30	90	16	120	3,13
HSK63	09C.6314.125	30	95	12	130	1,20
	09C.6318.160	30	89	16	125	1,13
	09C.6318.165	30	114	16	150	1,26

Triloc tool

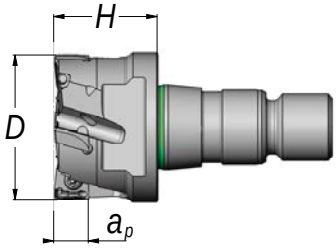
RO18-HSC



Primavant-HSC



Megavant-HSC



tools for Triloc program

	article	D	H	M	z_{eff}	a_p	ramp	ic	Kg	insert
RO18-HSC	**18R.2520.011**	25	20	M12	3	5,0	5,0°	yes	0,07	RD..10T3.N
	18R.3230.011	32	30	M16	4	5,0	4,0°	yes	0,19	RD..10T3.N
	18R.3535.011	35	35	M16	4	5,0	3,0°	yes	0,26	RD..10T3.N
	18R.4035.011	40	35	M16	5	5,0	3,0°	yes	0,29	RD..10T3.N
Primavant-HSC	**18U.4040.040**	40	40	M16	4	2,0	4,0°	yes	0,34	UE..1204.R
Megavant-HSC	**04M.0225.150**	28	25	M12	3	5,5	▪	yes	0,10	MO..1003.R
	04M.0325.150	35	25	M16	4	5,5	▪	yes	0,22	MO..1003.R

insert	incircle diameter		insert thickness	
	ø 10 =	10,00	S T3 =	3,97
	ø 12 =	12,70	S 03 =	3,60
			S 04 =	4,76

Allocation from machining parameters of AV material groups

	article	AS	grade	a_p at 1/4 from insert-Ø	cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
RD..10T3..	RDGX10T3M000210SN25	8	NERO^{2}43	f_z	0,5	0,35	0,3	0,4	0,35	0,3	0,25		
				v_c	280	260	250	280	260	250	240		
	RDGX10T3M000211TN28		SKY26	f_z	0,4	0,3	0,25						
				v_c	240	230	210						
	RDGX10T3M000214SN30		NERO^{2}43	f_z				0,3	0,3	0,25	0,25	0,2	0,2
				v_c				260	250	230	220	200	180

Allocation from machining parameters of AV material groups

	article	AS	grade	a_p at 1/4 from insert-Ø	stainless steel			titanium	aluminium
					C11	C10	C09	C08	E80
RD..10T3..	RDGX10T3M000210SN25	8	NERO^{2}43	f_z					
				v_c					
	RDGX10T3M000211TN28		SKY26	f_z					
				v_c					
	RDGX10T3M000214SN30		NERO^{2}43	f_z	0,2	0,15	0,1	0,1	0,3
				v_c	130	120	110	60-70	250-650

f_z adjustment at different a_p values												
a_p	0,5	1	1,5	2	2,5	3	3,5	4	5	6	7	8
RD 10	2,00	1,50	1,25	1,10	1,00	0,95	0,90	0,85	0,90			

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
UE..1204..	UEGW12041001610SR25	4	NERO^{2}77	f_z	2	1,6	1	2	2	1,5	1,5	1,2	1
				v_c	280	260	250	280	260	250	240	220	200
	UEGW12041001611TR28		NERO^{2}77	f_z	1,8	1,4	0,8	1,8	1,8	1,4	1,4	1	0,8
				v_c	280	260	250	280	260	250	240	220	200
			ICE^{2}43	f_z	1,8	1,4	0,8	1,8	1,8	1,4	1,4	1	0,8
				v_c	260	250	230	260	250	230	220	200	180
MO..1003..	MOGU10031003104TR28	2	SKY77	h_{max}	0,18	0,15	0,14	0,18	0,16	0,15	0,12	0,1	0,08
				v_c	240	230	220	240	230	220	180	160	140

insert		
RD..10T3.N	08B.0375.7991	TX208
UE..1204.R	08B.0411.7991	TX215
MO..1003.R	08B.0309.001	TX208

» Technical information for ramp page 109
» Technical information for f_z adjustment page 109
» Information for "theoretical corner radius" Primavant page 110

TECHNICAL INFORMATION

Terminology and formulas – milling

Chip/thickness of chip (mm)

$$h_{max} = \sqrt{\frac{a_e}{r}} \times f_z$$

Feed per tooth at h_{max} (mm)

$$f_z = \frac{h_{max}}{\sqrt{\frac{a_e}{r}}}$$

Chip volume (cm³/min)

$$Q = \frac{a_e \times a_p \times v_f}{1000}$$

Power (kW)

$$P = \frac{Q}{\text{value of diagram}}$$

Rotational speed (U/min)

$$n = \frac{v_c \times 1000}{D \times \pi}$$

Cutting speed (m/min)

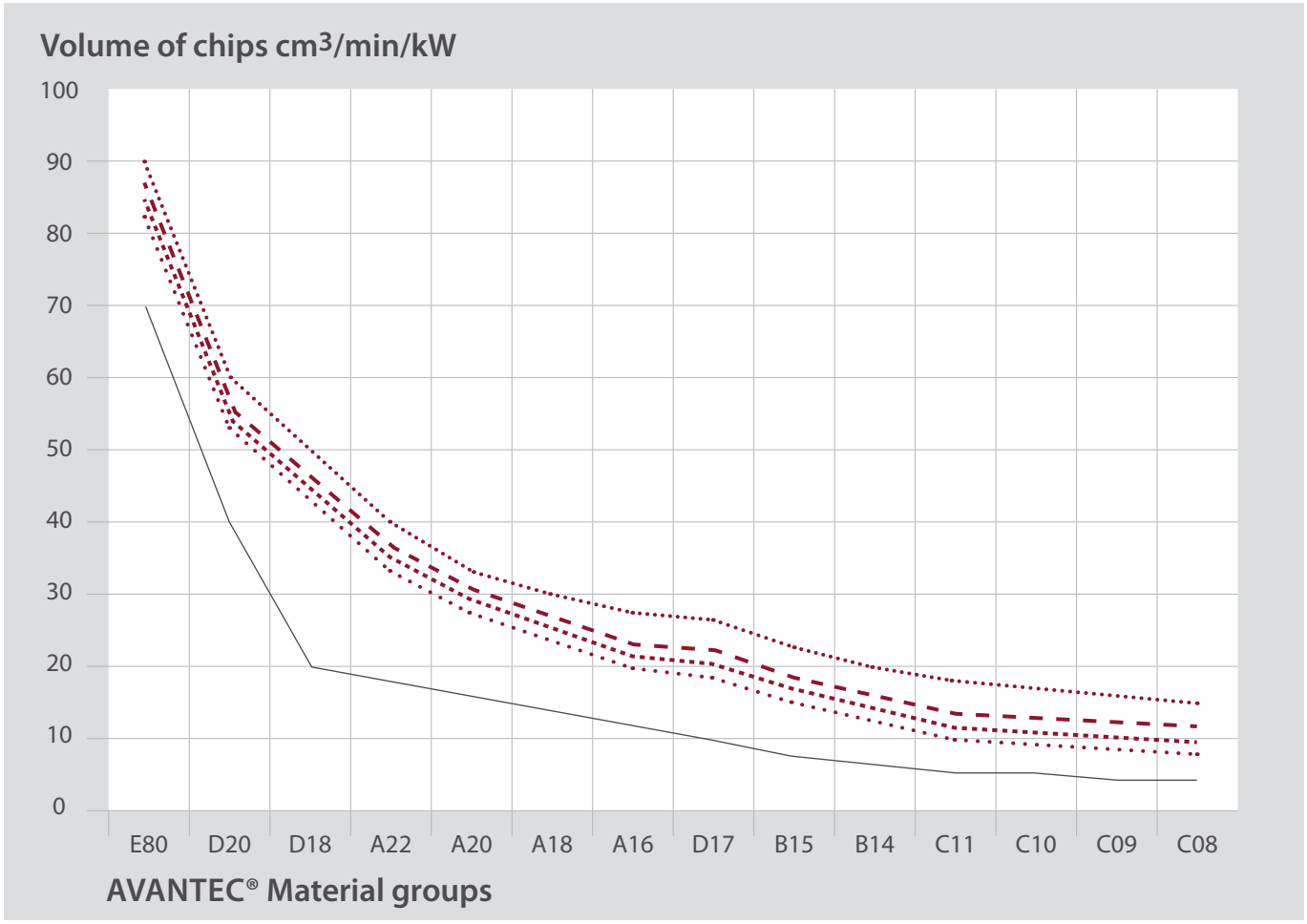
$$v_c = \frac{D \times \pi \times n}{1000}$$

Feed rate (mm/min)

$$v_f = n \times f_z \times z_{eff}$$

a_p	=	depth of the cut	mm
a_e	=	width of the cut	mm
v_c	=	cutting speed	m/min
v_f	=	feed rate	mm/min
n	=	rotational speed	U/min
D	=	cutter diameter	mm
f_z	=	feed per tooth	mm
z_{eff}	=	number of effective teeth	
Q	=	chip volume	cm³/min
P	=	power	kW
π	=	Pi = 3,14	
h_{max}	=	maximum chip thickness	mm
r	=	radius	mm

Metal removal rate diagram | Q



Classification into AVANTEC® insert categories

insert 1					
HE	OE	OF	SE	SX	UE
insert 2					
MO	RD	TC	TN		
insert 3					
CN	EC	EN	FN		
insert 4					
LN	SN				

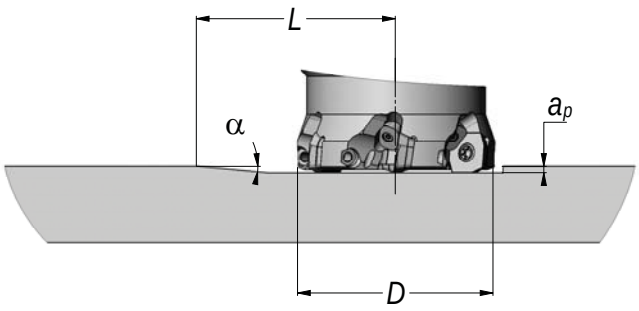
Material groups

AVANTEC Material group	DIN no. material		AFNOR	UNI	BS	EN	UNE	SS	AISI/SAE	JIS
aluminium										
E80	3.2371	G-AlSi7Mg							4218 B	
	3.2383	G-AlSi10Mg(CU)			LM9			4253	A360.2	
	3.2581	G-AlSi12			LM6			4261	A413.2	
	3.2583	G-AlSi12(CU)			LM20			4260	A413.1	
grey cast iron										
D20	0.6025	EN-GJL-250	Ft 25 D	G25	Grade 260		FG25	01 25-00	A48 40 B	FC 25
D18	0.6030	EN-GJL-300	Ft 30 D	G30	Grade 300		FG30	01 30-00	A48 45 B	FC 30
	0.6035	EN-GJL-350	Ft 35 D	G35	Grade 350		FG35	01 35-00	A48 50 B	FC 35
D16	0.0640	EN-GJL-400	Ft 40 D		Grade 400		FG40	01 40-00	A48 60 B	FC40
ductile cast iron										
D18	0.7040	EN-GJS-400-15	FGS 400-12	GS 400-12	Grade 420/12			07 17-02	60-40-18	FCD 40
	0.7050	EN-GJS-500-7	FGS 500-7	GS 500/7	SNG 500/7			07 27-02		
D17	0.7060	EN-GJS-600-3	FGS 600-3	GS 600/3	SNG 600/3			07 32-03		FCD 60
	0.7070	EN-GJS-700-2	FGS 700-2	GS 700/2	SNG 700/2			07 37-01	100-70-03	FCD 70
carbon steel C < 0,25%										
A18	1.0116	S235J2G3	E24-4	Fe 360 D FF	4360 40D		Fe 360 D1 FF	1312	A573-Gr.58	
	1.0144	S275J2G3	E28-3; E28-4	Fe 430 B	4360 43 C		Fe 430 D1 FF	1412; 1414	A573-Gr.70	SM41C
	1.0401	C15	CC12	C15; C16	080M15		F.111	1350	M1015;1016;1017	S15C
	1.0402	C22+N	AF42C20; XC25; 1C22	C20; C21; C25	055M15; 070 M20	2C	F.112	1450	M1020;1023	S20C; S22C
	1.1121	C10E	XC10	C10	040A10		F.1510-C10K	1265	1010	S10C
	1.1133	20Mn5	20M5	G22Mn3; 20Mn7	120M19		F.1515-20Mn6	1132	1022; 1518	SMnC420
	1.1141	C15E	XC15; XC18	C15; C16	080M15		F.1511-C16K	1370	1015, 1017	
	1.1158	C25E; Ck25	2C25; XC25	C25	070M26		F.1120-C25k	1450	1025	S25C; S28C
carbon steel C > 0,25% ... < 0,55%										
A22	1.0501	C35	AF 55 C 35	C35	060A35		F.113	1550	1035	S35C
	1.0503	C45	AF 65 C 45	C45	080M46		F.114	1650	1045	S45C
	1.1183	C35; Cf35	XC38TS	C36	060A35		1572	1035	1035	S35C
	1.1191	C45E; Ck45	XC42	C45	080M46		F.1140-C45K	1672	1045	S45C
A20	1.1213	Cf53	XC48TS	C53	060A52		C53	1674	1050	S50C
	1.5423	16Mo5		16Mo5 KG	1503-245-420		F.2602-16Mo5		4520	SB480M
carbon steel C > 0,55%										
A16	1.0535	C55	C54	C55	070M55		F.115	1655	1055	S55C
	1.0553	S355J0	E 36-3	Fe 510 C	4360 - 50 C					
	1.0601	C60	CC55	C60	080A62	43D			1060	S58C
	1.1203	C55E	XC55	C50	070M55		F.1150-C55K	1655	1055	S55C
	1.1221	C60E	XC60	C60	080A62	43D	C60	1678	1060	S58C
	1.1274	C100S	XC100	C100	060A96			1870	1095	SUP4
free cutting steel										
A18	1.0718	11SMnPb30; 9SMnPb28	S250Pb	CF9SMnPb28			F.2112-11SMnPb28	1914	12L13	SUM22L
	1.0722	10SPb20	10PbF2	CF10SPb20			F.2122-10SPb20		11L08	
	1.0726	35S20	35MF6		212M36	8M	F.210.G	1957	1140	
	1.0727	45S20	45MF4		212M44			1973	1146	
	1.0737	11SMnPb37; 9SMnPb36	S300Pb	CF9SMnPb36			F.2114-12SMnP35	1926	12L14	

AVANTEC Material group	DIN no. material		AFNOR	UNI	BS	EN	UNE	SS	AISI/SAE	JIS
low - high alloy steel Rm < 1100 (N/mm²)										
A18	1.1157	40Mn4	35M5		150M36	15			1035	1039
	1.1167	36Mn5	40M5		150M36		F.1203-36Mn5	2120	1335	SMn438(H)
	1.1170	28Mn6	20M5	C28Mn	150M28	14A	28Mn6		1330	SCMn1
B15	1.3505	100Cr6	100C6	100Cr6	535A99	31	F.1310-100Cr6	2258	52100	SUJ2
	1.5415	16Mo3; 15Mo3	15D3	16Mo3KW	1503-243 B		F.2601-16Mo3	2912	A204Gr.A	ASTM A20Gr.A
	1.5732	14NiCr10	14NC11	16NiCr11			F.1540-15NiCr11		3415	SNC415(H)
	1.5752	15NiCr13; 14NiCr14	12NC15		655M13	36A			3415; 3310	SNC815(H)
A18	1.6587	18CrNiMo7-6; 17CrNiMo6	18NCD6	(C18NiCrMo7)	820A16		F.1560-14NiCrMo13			
	1.7015	15Cr3	12C3		523M15				5015	SCr415(H)
	1.7033	34Cr4	32C4	34Cr4(KB)	530A32	18B	F.8221-35Cr4		5132	SCr430(H)
	1.7131	16MnCr5	16MC4	16MnCr5	527M20		F.1516-16MnCr5	2511	5115	
	1.7218	25CrMo4	25CD4	25CrMo4(KB)	1717CDS110		F.8372-AM26CrMo4	2225	4130	SCM420/430
B15	1.7262	15CrMo5	12CD4				F.1551-12CrMo4	2216		SCM415(H)
	1.7335	13CrMo4-5; 13CrMo4-4	15CD3.5	14CrMo4 5	1501-620Gr.27		F.2631-14CrMo45	2216	A182 F-11	ASTM A182
	1.8509	41CrAlMo7-10; 41CrAlMo7	40CAD6, 12	41CrAlMo7	905M39	41B	F.1740-41CrAlMo7	2940	A355 Cl.A	
low - high alloy steel Rm > 1100 (N/mm²)										
B15	1.5710	36NiCr6	35NCD6		640A35	111A			3135	SNC236
	1.6511	36CrNiMo4	40NCD3	36NiCrMo4(KB)	816M40	110	F.1280-35NiCrMo4		9840	
	1.6582	34CrNiMo6	35NCD6	35NiCrMo6(KB)	817M40	24	F.1272-40NiCrMo7	2541	4340	SNCM447
A16	1.7035	41Cr4	42C4	41Cr4	530M40	18	F.1211-41Cr4DF		5140	SCr440(H)
	1.7176	55Cr3	55C3	55Cr3	525A60	48	F.1631-55Cr3	2253	5155	SUP9(A)
	1.7220	34CrMo4	35CD4	35CrMo4	708A37	19B	F.8231-34CrMo4	2234	4135, 4137	SCM432
	1.7223	41CrMo4	42CD4TS	41CrMo4	708M40	19A	F.8232-42CrMo4	2244	4140; 4142	SCM440
	1.7225	42CrMo4	42CD4	42CrMo4	708M40	19A	F.8232-42CrMo4	2244	4140	SCM440(H)
B15	1.7361	32CrMo12	30CD12	32CrMo12	722M24	40B	F.124.A	2240		
	1.7337	16CrMo4-4	15CD4.5	14CrMo4 5	1501-620 Gr.27			2216	A387Gr.12CL.2	
	1.8159	51CrV4; 50CrV4	50CV4	50CrV4	735A50	47	F.1430-51CrV4	2230	6150	SUP10
A16	1.8515	31CrMo12	30CD12	30CrMo12	722M24		F.1712-31CrMo12	2240		
	1.8523	40CrMoV13-9; 39CrMoV13-9		36CrMoV12	897M39	40C				
tool steel										
B14	1.2080	X210Cr12	Z200C12	X210Cr13KU	BD3		F.5212-X210Cr12		D3	SKD1
	1.2083	X40Cr14; X42Cr13	X40Cr14	XU1Cr13KU			F.5263	2314	420	SUS 420 J2
	1.2344	X40CrMoV5-1; X40CrMoV51	Z40CDV5	X35CrMoV05KU	BH13		X40CrMoV5	2242	H13	SKD61
	1.2363	X100CrMoV5-1	Z100CDV5	X100CrMoV51KU	BA2		X100CrMoV5	2260	A2	SKD12
	1.2379	X153CrMoV12; X155CrVMo12-1	Z160CDV12	X155CrVMo121KU	BD2		F.5211X160CrMoV12	2310	D2	SKD11
	1.2436	X210CrW12		X215CrW121KU			X210CrW12	2312	(D6)	
	1.2581	X30WCrV9-3	Z30WCV9	X28W09KU	BH21		X30WCrV9		H21	SKD5
	1.2601	X165CrMoV12		X165CrMoW12KU	BD2		X160CrMoV12	2310	D2	
	1.3243	HS 6-5-2-5; S 6-5-2-5	Z85WDKCV	HS 6-5-2-5	BM35		HS 6-5-2-5	2723	M41	SKH55
	1.3343	HS 6-5-2C; S 6-5-2	Z85WDCV	X82WMo0605KU	BM2		HS 6-5-2	2722	M2 reg.C	SKH 51
	1.3348	H S2-9-2; S 2- 9-2	Z100WCWV	HS 2 9 2			HS 2-9-2	2782	M7	

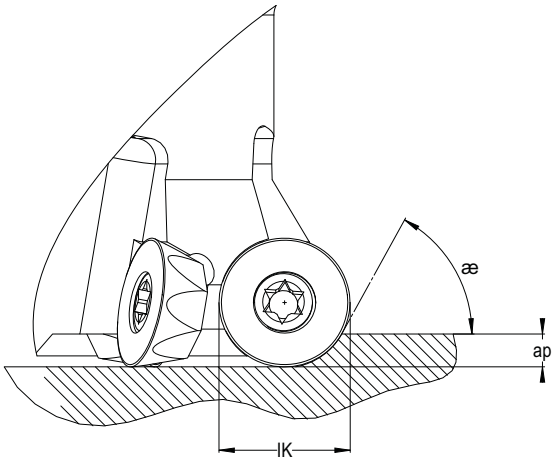
AVANTEC Material group	DIN no. material		AFNOR	UNI	BS	EN	UNE	SS	AISI/SAE	JIS
stainless steel and heat resistant steel (martensitic)										
C11	1.4000	X6Cr13	Z8C13	X6Cr13	403S17		F.3110-X6Cr13	2301	403	SUS403
	1.4006	X12Cr13; X10Cr13	Z10C14	X12Cr13	410S21	56A	F.3401	2302	410	SUS410
C10	1.4034	X46Cr13	Z40CM	X40Cr14	420S45	56D	F.3405		420	SUS420J2
	1.4057	X17CrNi16-2	Z15CNi6.02	X16CrNi16	431S29	57	F.3427	2321	431	SUS431
C11	1.4104	X14CrMoS17; X12CrMoS17	Z10CF17	X10CrS17			F.3117	2383	430F	SUS430F
C10	1.4113	X6CrMo171	Z8CD17.01	X8CrMo17	434S17		F.3116-X6CrMo171	2325	434	SUS434
	1.4313	X3CrNiMo13-4; X4CrNi13-4	Z4CND13.4M		425C11				F6NM	SCS5
	1.4718	X45CrSi9 3	Z45CS 9	X45CrSi8	401S45	52	F.322		HW1	SUH1
	1.4548	X5CrNiCuNb17-4-4	Z6CNU17-04						630	SUS 630
C11	1.4724	X10CrAlSi13; X10CrAl13	Z10C13	X101CrA112			F.311		405	SUS405
	1.4742	X10CrAlSi18; X10CrAl18	Z10CAS18	X8Cr17		60	F.3153-X10CrAl1813			SUH 21
C10	1.4747	X80CrNiSi20	Z80CSN20.02	X80CrSiNi20	443S65	59	F.3222-X80CrSiNi20-02		SAE HNV 6	SUH4
C11	1.4762	X10CrAlSi25; X10CrAl24	Z10CAS24	X16Cr26				2322	446	SUH446
stainless steel and heat resistant steel (austenitic)										
C09	1.4301	X5CrNi18-10; X5CrNi18-9	Z6CN18.09	X5CrNi1810	304S15	58E	F.3551	2332	304	SUS304
	1.4305	X8CrNiS18-9; X10CrNi18-9	Z10CNF18.09	X10CrNiS 18.09	303S21	58M	F.3508	2346	303	SUS303
	1.4306	X2CrNiN19-11	Z2CN18.10	X2CrNi18.11	304S12			2352	304L	SCS19
	1.4310	X10CrNi18-8; X12CrNi17-7	Z12CN17.07	X12CrNi1707	301S21		F.3517-X12CrNi177	2331	301	SUS301
	1.4311	X2CrNiN18-10	Z2CN18.10	X2CrN18-11	304S61		F.3541-X2CrNiMo1810	2371	304LN	SUS304LN
	1.4350	X5CrNi18-9	Z6CN18.09	X5CrNi18-10	304S31	58E	F.3551	2332 / 2333	304	SUS304
	1.4401	X5CrNiMo17-12-1; X5CrNiMo17-12-2	Z6CND17.11	X5CrNiMo17-12	316S25	58J	F.3534	2347	316	SUS316
	1.4429	X2CrNiMoN17-13-3	Z2CND17.13	X2CrNiMoN17-13	316S63		F.3534-X2CrNiMoN17133	2375	316LN	SUS316LN
	1.4435	X2CrNiMo18-14-3	Z2CND17.13	X2CrNiMo17-13	316S12			2353	316 L	SCS16
	1.4438	X2CrNiMo18-15-4	Z2CND19.15	X2CrNiMoN18-16	317S12		F.3539-X2CrNiMo18164	2367	317L	SUS317L
	1.4462	X2CrNiMoN22-5-3	Z2CND22.05 Az	X2CrNiMoN22-5	318S13			2377	318	SUS329J3L
	1.4541	X6CrNiTi18-10	Z6CNT18.10	X6CrNiTi18-11	321S12	58B	F.3523	2337	321	SUS321
	1.4542	X5CrNiCuNb16-4	Z7CNU15-05						630	SCS 24
	1.4550	X6CrNiNb18-10	Z6CNNb18.10	X6CrNiNb18-11	347S17	58F	F.3524; F.3552	2338	347	SUS347
	1.4571	X6CrNiMoTi17-12-2	Z6NDT17.12	X6CrNiMoTi17-12	320S17	58J	F.3535	2350	316Ti	
	1.4583	X10CrNiMoNb18-12; X10CrNi	Z6CNDNb	X6CrNiMoNb17-13					318	
	1.4828	X15CrNiSi20-12	Z15CNS20.12		309S24					
	1.4837	G-X 40 CrNiSi25-12			309 C 30					
	1.4845	X8CrNi25-12; X12CrNi25-21	Z12CN25 20	X6CrNi25-21	310S24		F.331	2361	310S	SUH310
	1.4848	G-X 40 CrNiSi25-20			310 C 40					
	1.4849	G-X 40 CrNiSiNB38-IB								
	1.4871	X53CrMnNiN21-9	Z52CMN21.09	X53CrMnNiN219	349S54				EV8	SUH35, SUH36
titanium alloys										
C08	3.7164	Ti 6242	Ti-6Al-2Sn-4Zr-2Mo							
	3.7165	Ti 6246	Ti-6Al-2Sn-4Zr-6Mo							

Ramp



< The ramp in angle α from the tool system is possible to the point of the maximum DOC from the system.
< The feed rate to ramp in should be not higher than 60% from the calculated tool feed rate. (Start always with a lower feed rate before increasing to the 60%.)
< For helical milling operation the infeeding per revolution has to be smaller than the maximum DOC from the insert type.

f_Z adjustment at different a_p values

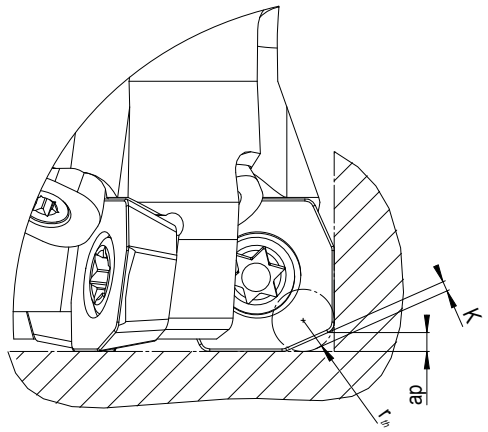


dependence from depth of cut a_p and entering angle æ

< By machining with round inserts and increasing the depth of cut a_p the feed per tooth f_Z should be corrected.
< The chip thickness h_{max} and the resulting entering angle æ by round inserts is depending on the depth of cut a_p.

Theoretical corner radius

Primavant UP90

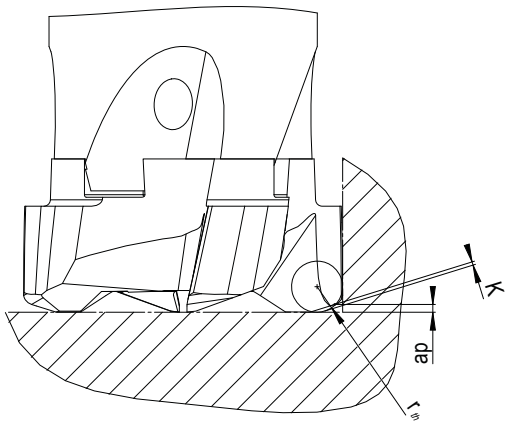


Programming information

insert	theoretical corner radius r_{th}	a_p	K non machined amount
UE..0903..	**2,0**	1,0	0,64
UE..1204..	**2,5**	2,0	0,80
UE..1506..	**3,0**	2,5	0,96

By programming with the theoretical corner radius the machined profile will have deviations from the programmed profile.

Turbavant SP18



Programming information

insert	theoretical corner radius r_{th}	a_p	K non machined amount
ECK1612..	**2,0**	0,8	0,26
ECK2512..	**2,0**	0,8	0,26

By programming with the theoretical corner radius the machined profile will have deviations from the programmed profile.

Fastening Torques

Torx fixing screws

thread	article	screw length	fastening torque	screwdriver
M2,5	08B.25__.7991	to 3,5	0,9 Nm	TX208
	08B.25__.7991	from 3,6	1,2 Nm	TX208
M3,0	08B.03__.7991	to 3,5	1,2 Nm	TX208
	08B.03__.7991	from 3,6	2,0 Nm	TX208
M3,5	08B.35__.7991	to 4,0	2,0 Nm	TX215
	08B.35__.7991	from 4,1	3,3 Nm	TX215
M4,0	08B.04__.7991	-	4,8 Nm	TX215
M4,5	08B.45__.7991	-	6,5 Nm	TX220
M5,0	08B.05__.7991	-	7,8 Nm	TX220
M6,0	08B.06__.7991	to 24	8,0 Nm	TX225
	08B.06__.7991	from 25	10,0 Nm	TX225

Double thread screws

thread	article		fastening torque	screwdriver
M5,0	08Z.0000.010		1,4 Nm	TX208
M5,0	08Z.0000.231	lefthand thread	5,0 Nm	TX220
M6,0	08Z.0000.093	lefthand thread	3,5 Nm	TX215
M8,0	08Z.0000.242		8,0 Nm	TX225

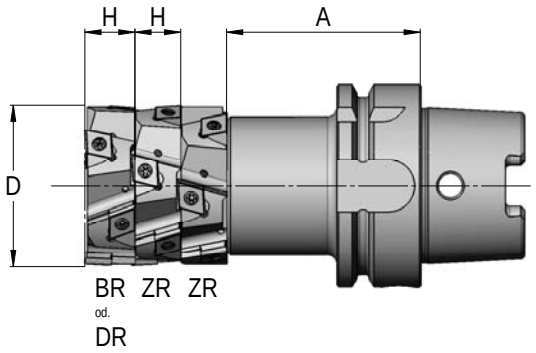
Acceptable for Torx screwdriver

screwdriver		fastening torque
TX208	max.	1,6 Nm
TX215	max.	5,5 Nm
TX220	max.	8,5 Nm
TX225	max.	12,0 Nm

Center screws

thread	article	fastening torque	1/2" socket for DIN6912	allen key for DIN6912
M8	08Z.08_ _.6912	50 Nm	GN 6-3	G 6
M12	08Z.12_ _.6912	90 Nm	GN 10-3	G 10
	08Z.12_ _.6912	90 Nm	GN 10-3	G 10
	08Z.12_ _.6912	90 Nm	GN 10-3	G 10
M14	08Z.14_ _.6912	100 Nm	GN 12-3	G 12
	08Z.14_ _.6912	100 Nm	GN 12-3	G 12
	08Z.14_ _.6912	100 Nm	GN 12-3	G 12
M16	08Z.16_ _.6912	140 Nm	GN 14-3	G 14
	08Z.16_ _.6912	140 Nm	GN 14-3	G 14
M20	08Z.20_ _.6912	160 Nm	GN 17-3	G 17
	08Z.20_ _.6912	160 Nm	GN 17-3	G 17
	08Z.20_ _.6912	160 Nm	GN 17-3	G 17
	08Z.20_ _.6912	160 Nm	GN 17-3	G 17
M24	08Z.24_ _.6912	500 Nm	-	G 19

Components and calculation center screw Multiring CM90 | EM90 | FM90 | MM90



To order a complete Multiring, depending on your requirements, you need at least the following components:
– shank
– center screw
– intermediate ring
– bottom ring or double cutting ring

You can reach a variable length by adding:
– intermediate rings / bottom ring or double cutting ring

Determine the overall length of the center screw based on the individual components that you have selected as in the following example for **Multiring D = 50** with **4 intermediate rings** (ZR) and **1 bottom ring** (BR)

+ 4 ZR x 14,2 mm = total 56,8 mm
+ 1 BR x 15,5 mm = total 15,5 mm
total H = 72,3 mm
+x-dimension = 20 mm
length center screw = 92,3 mm
corrected length of screw
(always round of in the classical way)
corrected length center screw = 90 mm

The first two calculated digits are "90" (90 mm). The correct article no. in our example would be 08Z.1209.6912 (length 120 mm article no. 08Z.1212.6912).

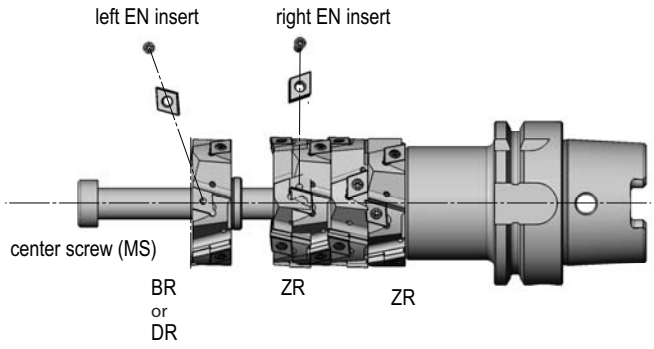
Order information
Multiring CM90 | EM90 | FM90 | MM90

Assignment – D to center screw / x-dimensions to determine total length

D	center screw	article no. center screw	max. length of milling tool	max. no. of cutting rings	x-dimension	1/2" socket for DIN6912	allen key for DIN6912
32 (CM)	M8	08Z.08_ _.6912	79	7	12	GN 6-3	G 6
32 (EM)	M8	08Z.08_ _.6912	81,5	8	12	GN 6-3	G 6
40	M12	08Z.12_ _.6912	120	12	18	GN 10-3	G 10
45		08Z.12_ _.6912	156	12	20	GN 10-3	G 10
50		08Z.12_ _.6912	171	12	20	GN 10-3	G 10
63	M14	08Z.14_ _.6912	192	12	21	GN 12-3	G 12
63		08Z.14_ _.6912	197*	12	21	GN 12-3	G 12
66		08Z.14_ _.6912	196	10	21	GN 12-3	G 12
80	M16	08Z.16_ _.6912	242	11	24	GN 14-3	G 14
80		08Z.16_ _.6912	245*	11	24	GN 14-3	G 14
92	M20	08Z.20_ _.6912	223	12	27	GN 17-3	G 17
92		08Z.20_ _.6912	227*	12	27	GN 17-3	G 17
100		08Z.20_ _.6912	264	12	30	GN 17-3	G 17
100		08Z.20_ _.6912	267*	12	30	GN 17-3	G 17
125	M24	08Z.24_ _.6912	295	10	36	-	G 19

* double cutting ring

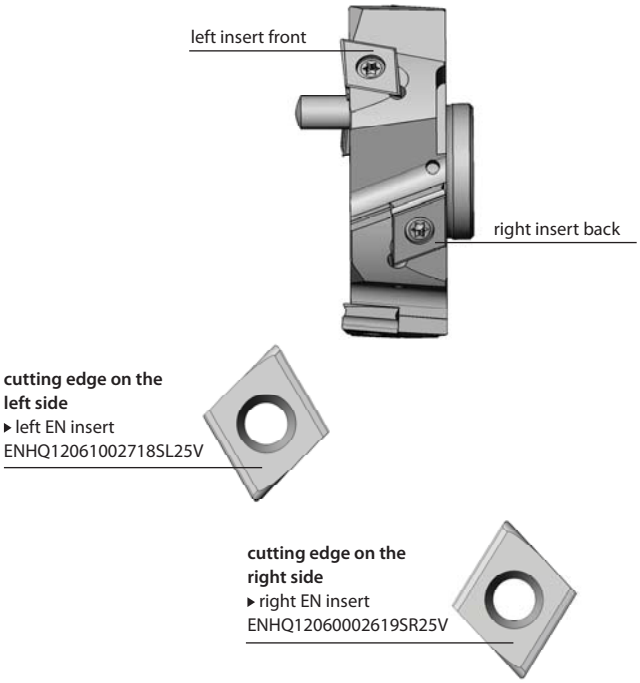
Assembly of the intermediate, bottom or double cutting ring



Assembly of the Multiring

1. The intermediate rings fitted with indexable inserts are stacked one after another onto the shank. A dowel pin is used to ensure correct positioning. The intermediate rings are interchangeable.
2. The bottom or double ring forms the end of the complete cutting unit.
3. The appropriate center screw (MS) is inserted through the entire cutting unit and screwed in until the specified torque has been reached (see page 111/table).

Assembly the CN/EN/FN indexable insert

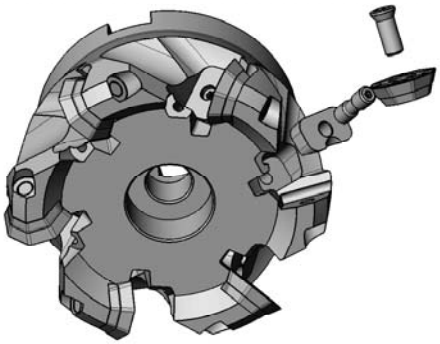


Assembly the indexable insert

1. Place the indexable insert on the insert seat. Ensure that the left and the right cutting CN/EN/FM inserts are mounted on the correct seats.
2. Screw in the fixing screw. Note that this may cause the insert to „rise". To correct this, press the CN/EN/FN insert in place while screwing in the fixing screw.
3. Overcome the tightness and screw in the fixing screw until it is stationary or until the specified torque has been reached (see table on page 111).

Important!
- Assembly must be carried out under contaminant-free conditions.
- To guarantee easy replacement or release of the indexable insert and screw, we recommend the use of our screw lubricant: order no. 08F.0050.001.

Mounting of a wedge-mounted indexable insert

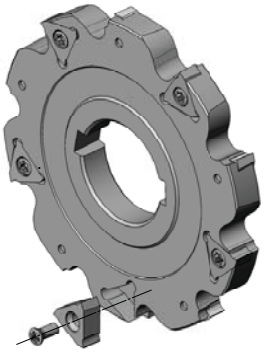


Mounting of a wedge-mounted indexable insert

1. Turn the double-threaded screw half to release the wedge.
2. Place the insert onto the seat and lock in place over the octagonal fixture on the tool body.
3. Tighten the wedge slightly by turning the double-threaded screw.
4. Screw down the fixing screw, overcoming the tightness until the specified torque has been reached (see the table on page 115) (applicable to HE60, SE60, SX45, VC1.1 and VC2.2).
5. Tighten the double-threaded screw until the wedge fits snugly on the insert (see the table on page 111). These instructions apply equally to HE60, SE45, SE60 SX45, EK90, SK90 and UP90.

Attention!
KC2.2 clamping wedges will be tightened by a left turn.

Installing, turning and replacing the TC/TN indexable insert



Assembly the indexable insert

The three sides of the TC/TN insert create a fit in the cutter body. Observe the following in addition to the items mentioned above:

Caution:

1. When mounting the indexable insert pay attention that it is not tilted.
2. Exert slight pressure on the indexable insert when installing it in its set.
3. Screw down the fixing screw, overcoming the tightness until the specified torque has been reached (see the table on page 111).

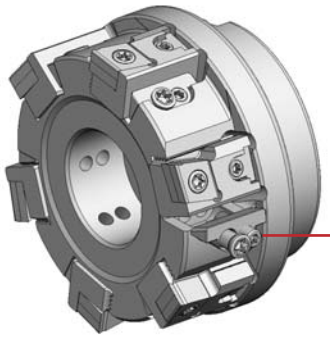
Turning or replacing the indexable insert:

1. First completely unscrew the fixing screw.
2. Tap the side of the cutter with the handle of torx driver on the side where the insert needs to be changed. **Caution!** Don't hammer on the side opposite to the indexable insert to be changed!
3. Due to the "masses' inertia" effect the insert moves up leaving its seat and can be replaced or turned.

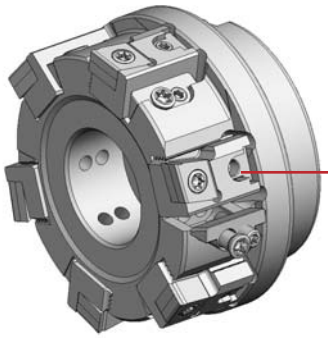
Important!

- Assembly must be carried out under contaminant-free conditions.
- To guarantee easy replacement or release of the indexable insert and screw, we recommend the use of our screw lubricant: order no. 08F.0050.001.

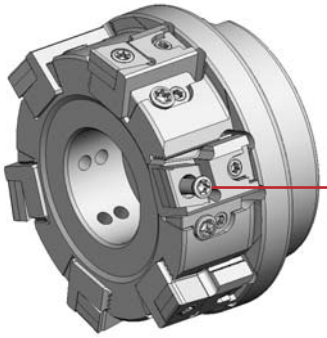
Assembly instruction Finavant EK90 / SK90



1. Loosen the contour screw and clamp.



2. Reset the cartridges in axial direction.
(Screw back the adjustment wedge in its entirety).



3. The indexable inserts can be exchanged.
Screw new indexable inserts tight with a compatible torx key.
Tighten or lock all other screws.

4. Place milling cutter on the measuring device.
Pull all cutting edges individually through the dial gage to identify the highest cutting edge.
The highest cutting edge provides the reference dimensions for all other cutting edges.
Reference the dial gage on the highest cutting edge and set it to zero.
Set all other cutting edges to the reference part dimensions using the adjustment element.
No further cutting edge fixation steps required.

The entire procedure – insert change including adjustment of the indexable inserts – takes a maximum of 15-20 min.

Problem - Recommendations

Problem during cutting:	**Our recommendations:**
brittle cracks at the cutting edges:	– increase the cutting speed – apply tougher grade – stronger and more stable edge – change the feed while entering into the cut – change the entering and leaving of the tool
built-up edge (BUE):	– increase the cutting speed – apply more positive geometry
fatigue crack at the cutting edge:	– apply tougher grade – change the feed – apply different geometry – change the entering and leaving of the tool
flank wear:	– apply more wear resistant grade – decrease the cutting speed – increase the feed
plastic deformation:	– decrease the cutting speed – decrease the feed – apply more wear resistant grade
poor surface quality:	– select special-purpose geometry – W/S – increase the machining strategy – reduce the f_z (feed/insert)
small crack at the cutting edge:	– do not apply cutting fluids – apply tougher grade
vibration:	– select special-purpose geometry – W – increase the f_z (feed/insert) – change the machining strategy

AVANTEC® – indexable inserts – designations

O	F	E	W	20	06	MO	**00130**	S	N	28	S	NERO²77
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
E	N			12	06		**02718**	S	L	25	V	SKY77

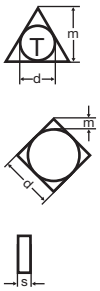
1 Insert shape

M C/E/F L H O R S T

2 Lead angle

C 7° D 15° E 20° F 25° N 0°

3 Tolerances (excerpt)



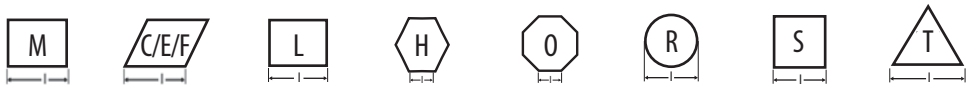
allowable deviation in mm for

	d	m	s
A	± 0,025	± 0,005	± 0,025
E	± 0,025	± 0,025	± 0,025
G	± 0,025	± 0,025	± 0,05-0,13
H	± 0,013	± 0,013	± 0,025
K	± 0,05-0,15	± 0,013	± 0,025
F	± 0,013	± 0,005	± 0,025

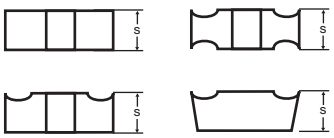
4 Machining and mounting characteristics

Q W R N T U X drawing or detailed description required

5 Size of the insert (length of cutting edge / diameter)



6 Insert thickness



7 Corner radius (excerpt)

04 r = 0,4
08 r = 0,8
10 r = 1,0
25 r = 2,5

lead angle on the face cutting edge
F = 25°
Z = other lead angles

00 for diameters with specified inch dimensions converted to mm

M0 for diameters in metric dimensions

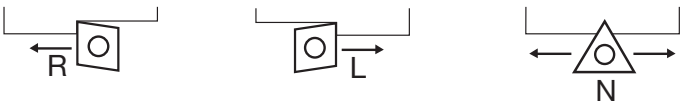
setting angle χ
A = 45°
E = 75°
P = 90°

8 Document number

Will be declared from the manufacturer for internal document processing.

9 Cutting edge form

10 Cutting direction



11 AVANTEC® geometry

-23 roughing geometry for heavy machining with large depth of cut and high feed per tooth
-25 roughing geometry for heavy machining with medium depth of cut and high feed per tooth
-28 rough-finish geometry for medium depth of cut and medium feed per tooth
-30 rough-finish geometry for small feed per tooth
-33 finish geometry

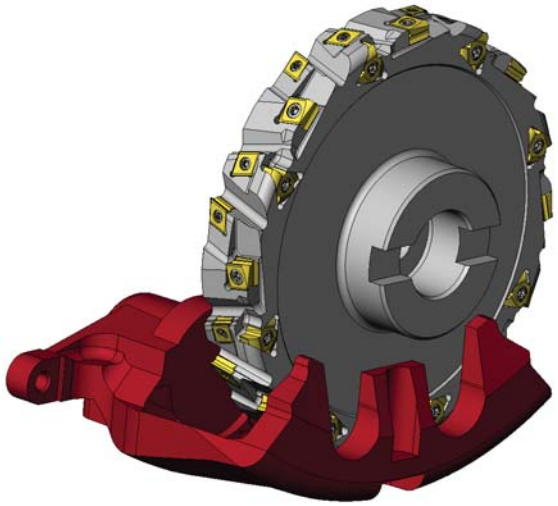
12 Additional special-purpose geometries

S finishing
V low-vibration
W combination of S and V geometries

13 AVANTEC® Types

AV1077 SKY26 / SKY77 DELPH43 ICE43 NERO26 / NERO77 ICE²43 / ICE²77 NERO²43 / NERO²77 CAN²26 / CAN²77

First comes the solution. Then comes our tool.

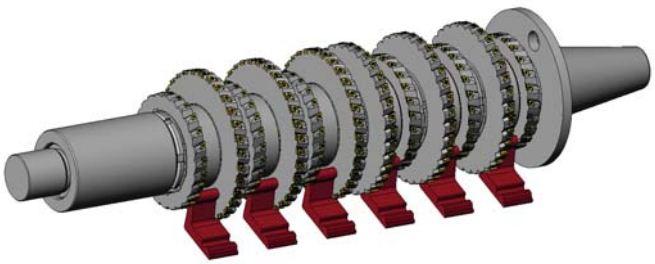


Challenge

Work piece | Brake caliper
Operations | milling the brake disk slot
Material | GJS
Requirement | machining the contact face and the brake disk slot with a single tool in 2 cuts

Solution

Tool | Xtra side milling cutter
Special features | **1 tool** | **1 cut**
Advantages | 20% cycle time reduction | 62% increase of tool life



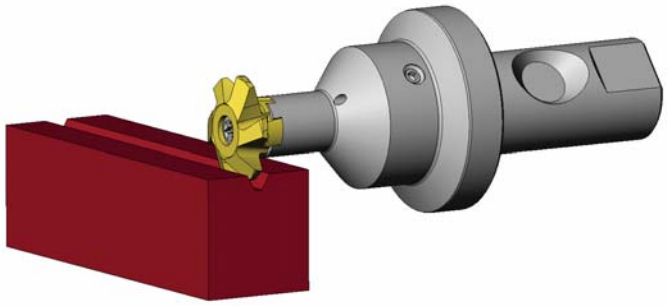
Challenge

Work piece | Hinge
Operations | side cutting | mouth milling
Material | Plain steel
Requirement | Boost in machining performance | prevention of tool breakage as a result of vibration | noise level reduction / reduction of the change and set-up time

Solution

Tool | Special side milling cutter kit
Special features | Pre-adjusted set comprising 12 side milling cutters with max-Ø 200 mm and zz = 16
Advantages | **No set-up times** | elimination of damaging vibrations | machining of 6 work pieces in one cut | high precision

And then your success. (Part 1)

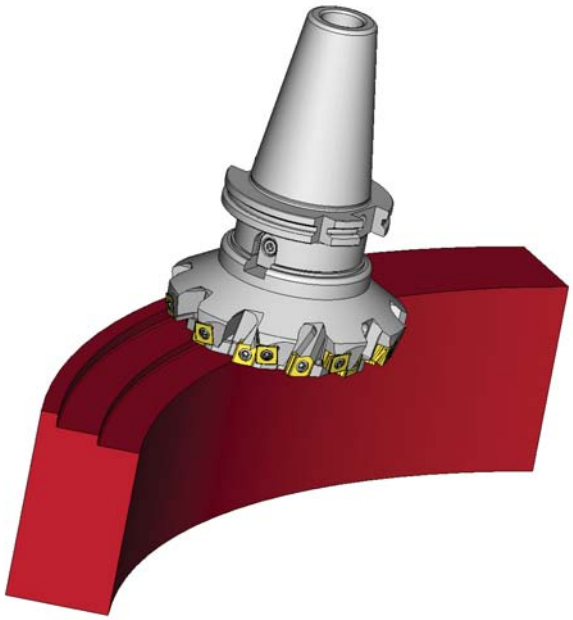


Challenge

Work piece | Palette profile
Operations | Profile milling
Material | Titanium
Requirement | Procession time reduction | lowering the storage and regrinding costs | significant tool life expansion

Solution

Tool | Special slot milling cutter Easy-Change-Program
Special features | **50% faster** | **50% longer tool life** | no regrinding | no tool breakage | minimal storage costs | consistent quality



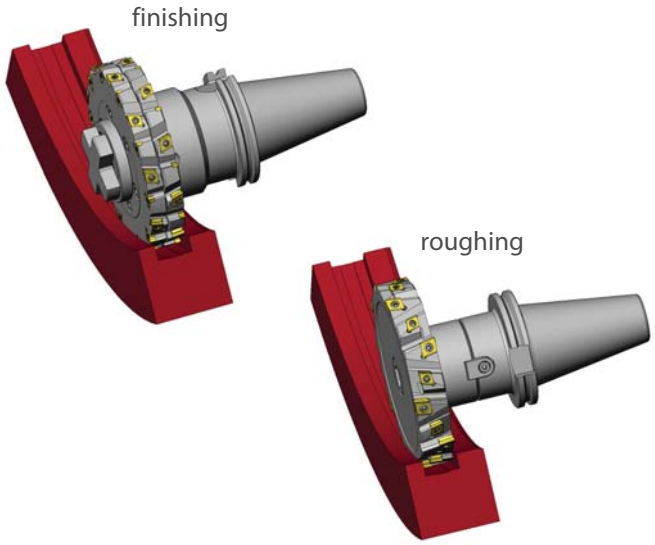
Challenge

Work piece | Casing
Operations | Milling of a multi-stage special contour
Material | GJS
Requirement | Considerably reduced machining time | unstable setting of the work pieces | low vibration milling | reduced noise level

Solution

Tool | Multi-stage contour milling cutter
Special features | combination tool with Ø 63/120/140 mm and zz = 10
Advantages | **1 tool** and **1 milling operation** instead of 3 tools and 3 milling operations | drastic reduction of the machining time | process secure and low vibration milling

First comes the solution. Then comes our tool.

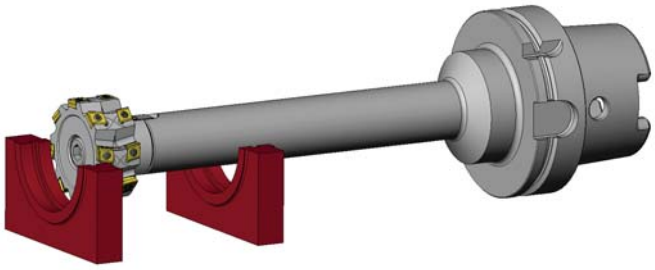


Challenge

Work piece | Bearing housing
Operations | Roughing and finishing
Material | GJS500
Requirement | Reduction of machining time | roughing and finishing with 1 each tool instead of each 2 tools in 3 rounds as before | tool life increase | no adjustable finishing cutter

Solution

Tool | Special counter milling
Special features | **Roughing** Ø 160 mm and zz = 5 x 4 and **finishing** Ø 160 mm and zz = 10 x 4 **in 1 each cut**
Advantages | 50% faster | 50% increase of tool life



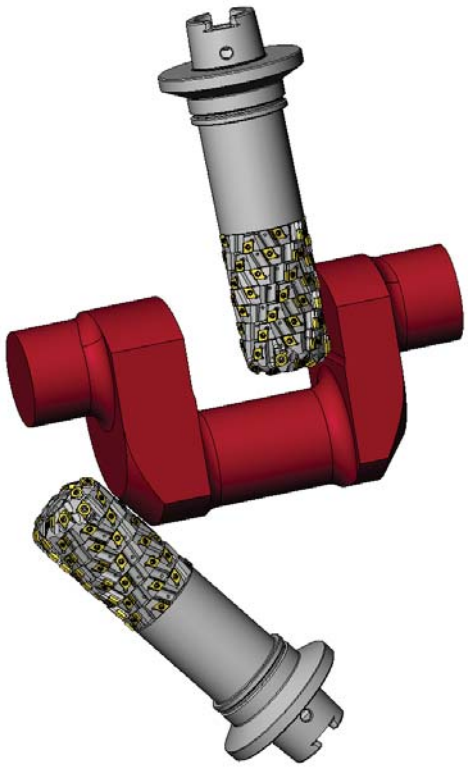
Challenge

Work piece | Engine block/crankcase
Operations | Roughing and finishing flange bearing width
Material | GJL250
Requirement | Highly precise, low vibration machining despite wide overhang | adjustable tool not desired | consolidation of multiple tools into just one

Solution

Tool | Xtra side milling cutter kit EB18
Special features | Pre-adjusted set of 12 disk milling cutters with Ø 57 mm and zz = 8 x 2
Advantages | **1 tool for roughing and finishing** | no adjusting time | high feed rates attainable | reduced machine wear and tear

And then your success. (Part 2)

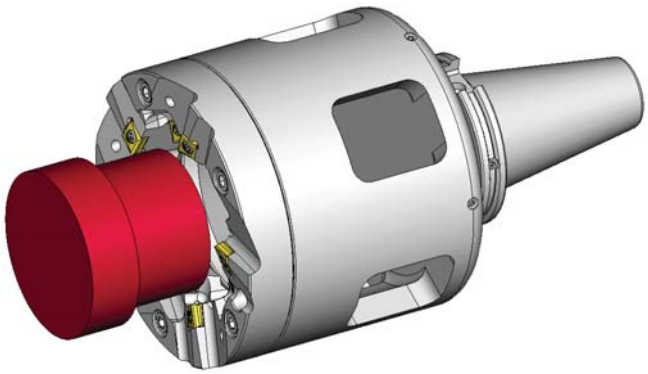


Challenge

Work piece | Large crank shaft
Operations | Milling the hub wideness and the pin chamfer
Material | 42 CrMo4
Requirement | Reduction of machining time and of immense tooling costs | significantly increase of tool life

Solution

Tool | Multiring EM90
Special features | Modular shell end mill with Ø 125 mm and zz = 8 x 4
Advantages | Extreme cutting length in case of radial chip removal of up to 6 mm | **1200% more Q** | lowering of costs by using a standard solution | high process security



Challenge

Work piece | Asymmetric castings
Operations | Diameter-/roughing machining
Material | GJS700
Requirement | Drastic machining time reduction | flexible tool for the machining of various diameters | faster and simpler replacement of cutting rings | high process security

Solution

Tool | Special countersinking tool
Special features | Flexible system
Advantages | Highly stable insert pockets | indexable inserts have 4 cutting edges | easy and quick handling | feed rate increased multiple times compared to existing tool systems

Milling cutters

Inserts

AVANTEC®
MILLING. HIGHLY POSITIVE

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It's all about Q