



CATALOGUE

Discover AVANTEC's tool portfolio
and take advantage of the possibilities –
YOUR PRODUCTION CAN PERFORM MORE!





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LEGEND

ZR	- intermediate ring	ic	- internal coolant
BR	- bottom ring	TK	- pitch circle
DR	- double cutting ring	SW	- width across flats
AS	- number of cutting edges		

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. For more detailed information please contact our head office or ask your appropriate contact person.

Company

AVANTEC Zerspantechnik is an independent family-owned company based in Illingen, Baden-Württemberg. Founded in 1989 by Gustav Werthwein, the company has earned an important position among the milling tool manufacturers. As a producer of milling tools with high-precision ground inserts, AVANTEC has been developing a wide portfolio that fits the demand of every customer.

Being a pioneer in the field of the high positive tool systems has given AVANTEC the opportunity to win a place in the market and make a name for itself. The uncompromising focus on the primary tasks of machining technology has always distinguished the company as a quality-minded cutting tool specialist.

As every specialist knows, the contact with customers is essential for a successful business cooperation. AVANTEC's capable customer service network is always ready to answer questions and offer the right solutions in the nick of time. For our customers this can be translated into a quick response, a prompt development of their requests and a service of excellence.

AVANTEC's lean company profile gives also the advantage of processing our customers' requests in a quick and uncomplicated way. Our high vertical manufacture range and the know-how acquired over the years are the basis to create in-house products that can be completely developed by our company, from the conceptual design up to the last manufacturing process. We regularly share our experience with high-positive machining at different workshops organized by AVANTEC and during training courses specially requested by customers.

Reliability is for us not only the achievement of high standards in the products' quality but also in the planning process, the assistance and loyal delivery in worldwide service to our customers. Our success in the market has not only been certified by DIN EN ISO 9001 but it has also been confirmed throughout the years by a long-lasting partnership between our customers and AVANTEC, particularly based on the primary principle of mutual trust.





Milling tool programme

AVANTEC's tool programme offers the most demanding customers the advantages of high positive machining. Due to their smooth running features AVANTEC's tools are suitable for low-vibration milling operations. Their extremely soft-cutting geometries can guarantee top reliability and efficiency rates in high-volume machining processes.

Advantages of our high positive milling tool programme:

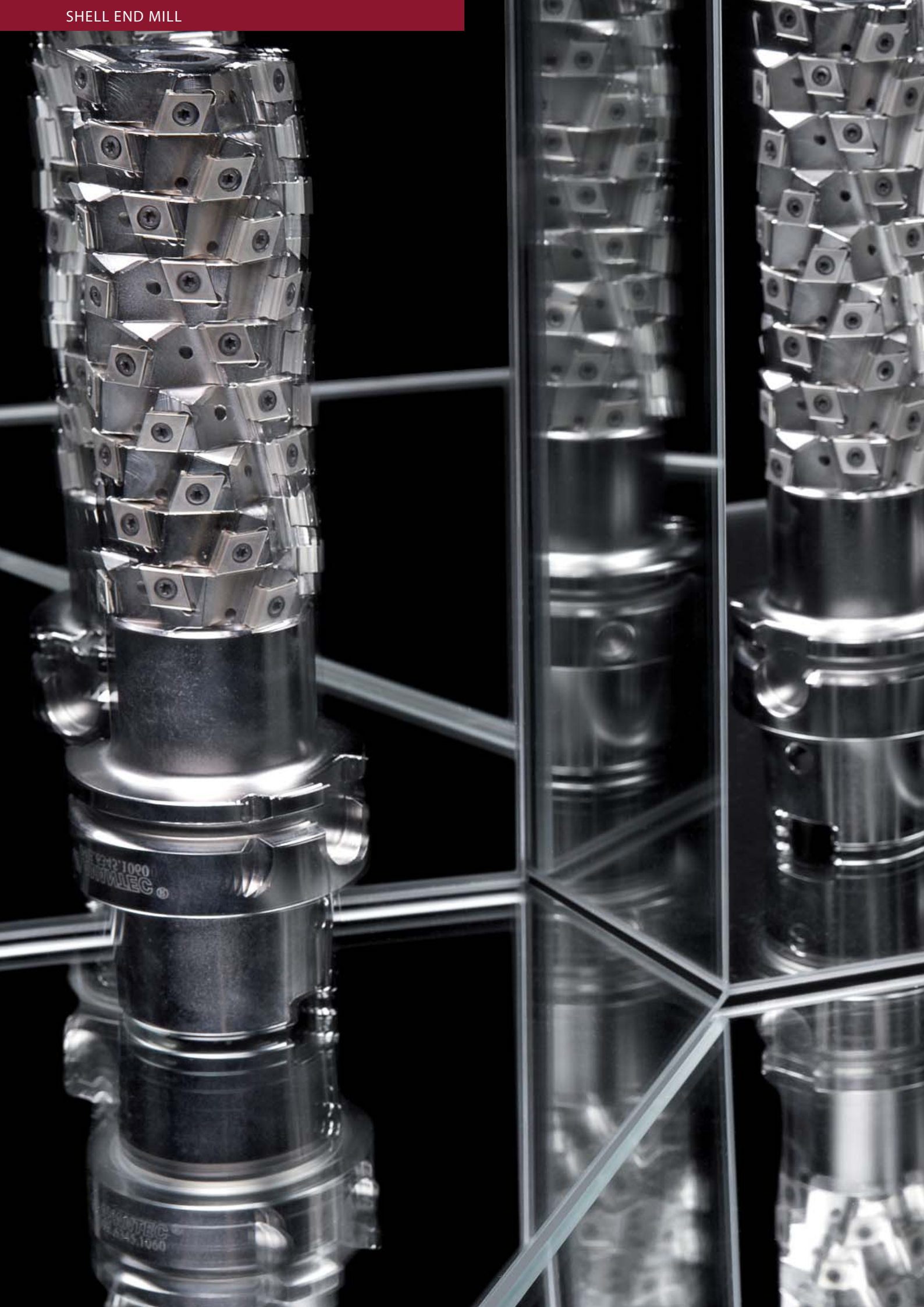
- < smooth cutting
- < less load for machine, spindle and keyways
- < higher chip removal
- < very suitable for unstable or thin parts
- < improved chip flow

Indexable inserts

A thorough quality control policy is the key to the company's success at the international market. By developing new substrates and improving our modern high-performance coatings we keep bringing innovative inserts with micro-geometry and offering our customers a wide variety of possibilities for the most exigent machining requirements.

Advantages of highly precise indexable inserts:

- < consistent axial and radial run out
- < consistent dimensional accuracy during cutting operation
- < constant machining data
- < constant surface quality
- < less machining noise and improved chip flow
- < less heat build up and better tool life
- < constant dimensions after indexing





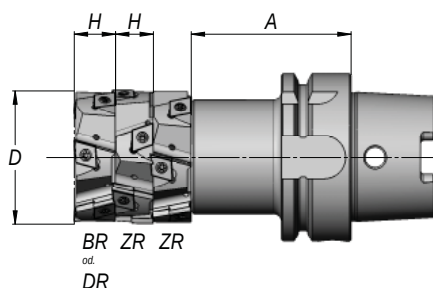
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09E.6345.1060

SHELL END MILL

Multiring EM90/FM90



- < modular discs allow various gage lengths up to $2,5 \times D$
- < dual right and left helix design minimizes axial tractive and compressive forces
- suitable for machines with lower performance



Shanks for Multiring EM90/FM90

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	1,20	09E.6332.1050	50	0,82	■	■	■
40	■	■	■	09A.5040.004	49	3,10	09A.4040.002	39	1,30	09E.6340.1060	60	1,00	■	■	■
45/50	■	■	■	09A.5045.001	39	3,10	09A.4045.001	39	1,00	09E.6345.1060	60	1,20	09E.1045.001	85	3,24
45/50	■	■	■	09A.5045.016	90	3,60	09A.4045.007	90	1,68	■	■	■	■	■	■
63/66	■	■	■	09A.5063.008	49	3,70	■	■	■	09E.6363.1060	60	1,50	09E.1063.1080	80	3,30
63/66	■	■	■	09A.5063.031	100	4,60	■	■	■	■	■	■	■	■	■
63/66	■	■	■	09A.5063.021	150	5,70	■	■	■	■	■	■	■	■	■
80	■	■	■	09A.5080.006	49	4,00	■	■	■	■	■	■	09E.1080.1080	80	4,10
80	■	■	■	09A.5080.025	100	5,80	■	■	■	■	■	■	■	■	■
92	■	■	■	09A.5092.001	49	3,68	■	■	■	■	■	■	09E.1092.001	80	4,40
100	■	■	■	09A.5010.002	49	4,30	■	■	■	■	■	■	09E.1010.1100	110	6,60
100	09A.6010.002	75	11,40	09A.5010.023	100	6,00	■	■	■	■	■	■	■	■	■
125	09A.6012.001	75	11,50	■	■	■	■	■	■	■	■	■	■	■	■

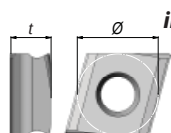
other dimensions on request

ZR/BR/DR Multiring EM90/FM90

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
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
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	■	■	■	■
66	12F.6619.031	19,5	3	12F.6620.032	20	3	3 FNHQ110608.R 3 FNHQ110608.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
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 LNEX25082500201TR25
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	12E.1234.001	34	5	5 ENHQ160900.R 5 ENHQ160915.L 5 LNEX25062501001TR25*

* not in the intermediate ring

D	Kg ZR/BR/DR
32	< 0,5
40	< 0,5
45	< 0,5
50	< 0,5
63	< 0,5
66	< 0,5
80	< 1,0
92	< 1,0
100	< 1,5
125	< 2,5

**insert** **incircle diameter**

∅ 06 =	6,35	∅ 12 =	12,70
∅ 08 =	8,00	∅ 16 =	16,00
∅ 09 =	9,52	∅ 20 (LN) =	9,52
∅ 10 =	10,00	∅ 25 (LN) =	12,70
∅ 11 =	11,00		

insert thickness

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

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..	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		
			NERO26	h _{max}	0,1	0,08	0,08						
				v _c	220	200	180						
	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		
			NERO26	h _{max}	0,1	0,08	0,08						
				v _c	220	200	180						
	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		
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		
			NERO26	h _{max}	0,15	0,12	0,1						
				v _c	220	200	180						
	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

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
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		
			NERO26	h _{max}	0,18	0,15	0,12						
				v _c	220	200	180						
	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		
			NERO26	h _{max}	0,18	0,15	0,12						
				v _c	220	200	180						
	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		
			NERO26	h _{max}	0,18	0,15	0,12						
				v _c	220	200	180						
	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		
			NERO26	h _{max}	0,18	0,15	0,12						
				v _c	220	200	180						
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		

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
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		
FN..08T3..	FNHQ08T30600409SL28V	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						
	FNHQ08T30000510SR28V	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						
FN..1106..	FNHQ11060801801TL25V	4	SKY77	h _{max}	0,24	0,2	0,18	0,22	0,2	0,18			
				V _c	200	180	160	200	180	160			
	FNHQ11060801802SL28V	4	SKY77	h _{max}	0,2	0,18	0,16	0,2	0,18	0,16			
				V _c	200	180	160	200	180	160			
	FNHQ11060801901TR25V	4	SKY77	h _{max}	0,24	0,2	0,18	0,22	0,2	0,18			
				V _c	200	180	160	200	180	160			
	FNHQ11060801902SR28V	4	SKY77	h _{max}	0,2	0,18	0,16	0,2	0,18	0,16			
				V _c	200	180	160	200	180	160			

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
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			
	LNEX25062501001TR25	2	SKY77	h _{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v _c	200	180	160	200	180	160			
LN..2508..	LNHX25082500201TR25	2	SKY77	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	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		

insert

EN..0603.R/L	08B.2506.7991	TX208
EN..08T3.R/L	08B.0309.7991	TX208
EN..0904.R/L	08B.3511.7991	TX215
EN..1005.R/L	08B.3511.7991	TX215
EN..1206.R/L	08B.0513.7991	TX220
EN..1609.R/L	08B.0617.7991	TX225
FN..08T3.R/L	08B.0309.7991	TX208
FN..1106.R/L	08B.3511.7991	TX215
LN..2007.R	08B.3511.7991	TX215
LN..2506.R	08B.4511.7991	TX220
LN..2508.R	08B.0513.7991	TX220
MO..1003.R	08B.0375.7991	TX208

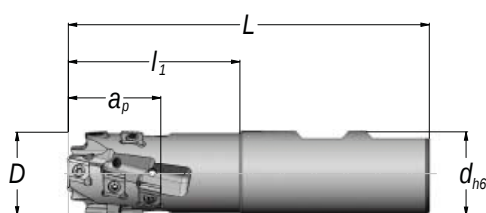
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Shell end mill EW90

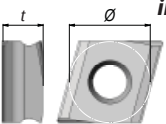


- < fine pitch design utilizing the insert
- < soft and free cutting tool
- < high reliability due to the distribution of the cutting edges



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

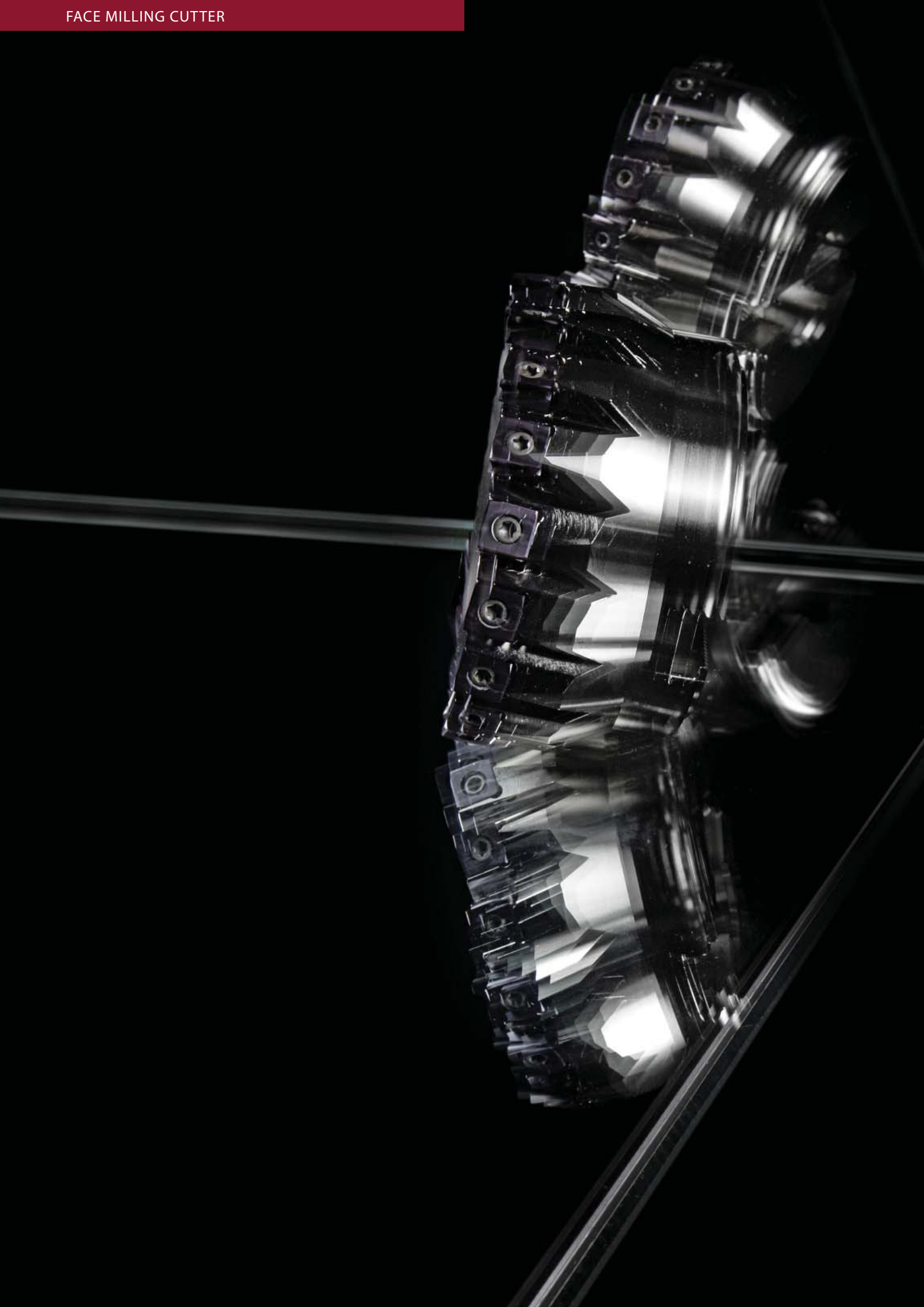
	insert	incircle diameter	insert thickness
		Ø 06 = 6,35	t 03 = 3,18
		Ø 08 = 8,00	t T3 = 3,97

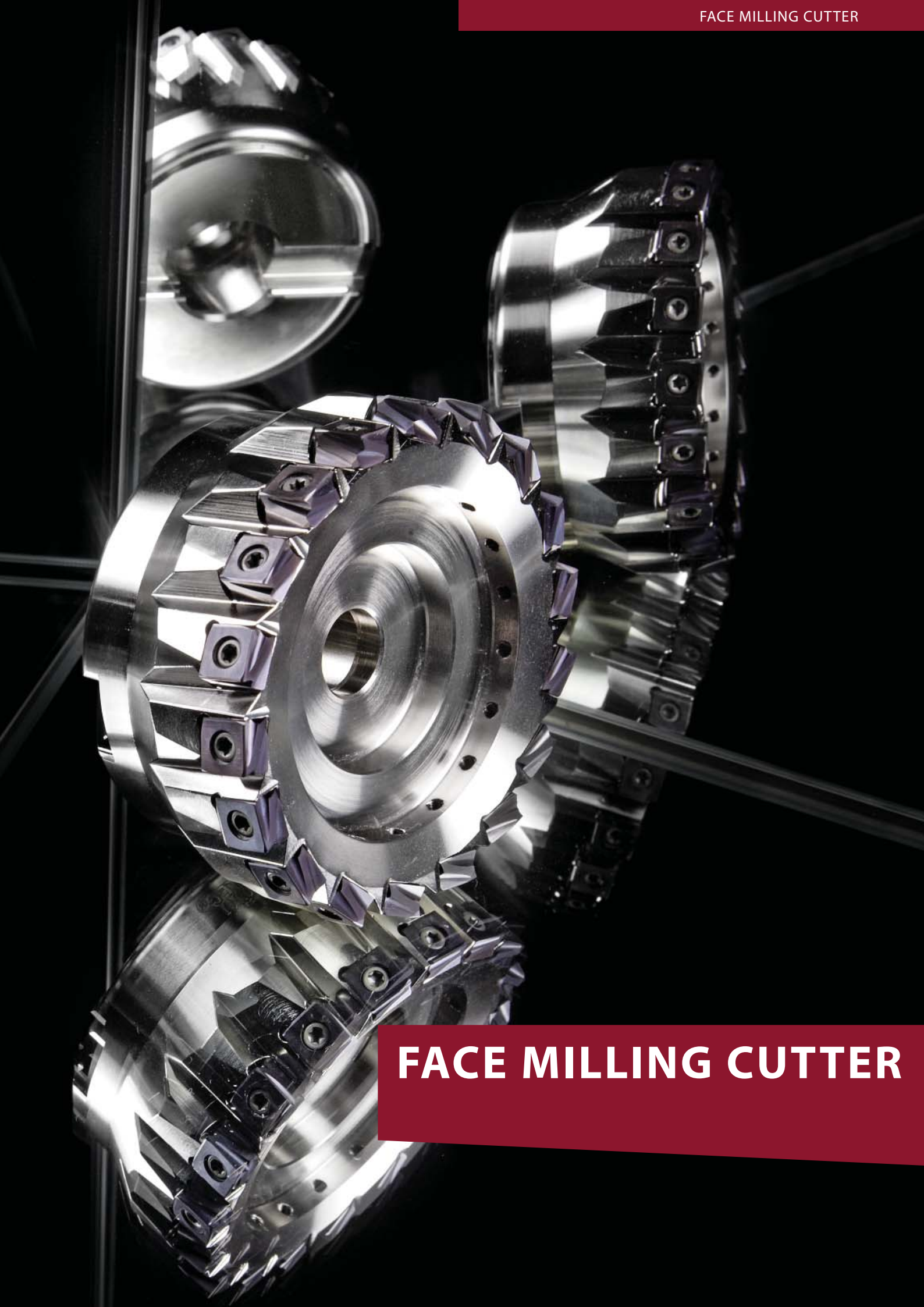
Allocation from machining parameters of AV material groups

	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		
			NERO26	h _{max}	0,1	0,08	0,08						
				v _c	220	200	180						
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

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

» Assembly instructions page 108





FACE MILLING CUTTER

Avantop KC1.1/KC2.2

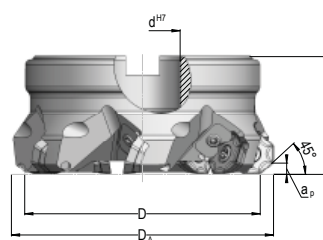
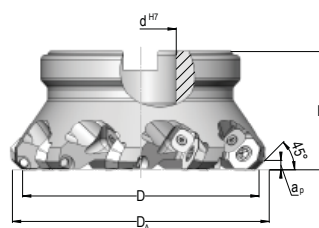
Avantop KC1.1



Avantop 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

article	D	D _A	H	d ^{H7}	z _{eff}	a _p	wedge	ic	Kg	insert
030.5043.020	50	58,8	43	22	6	3,5	yes	no	0,37	OF..1505.N
030.6340.020	63	71,9	40	22	7	3,5	yes	yes	0,57	OF..1505.N
030.8050.020	80	88,9	50	27	8	3,5	yes	yes	0,97	OF..1505.N
030.1050.020	100	108,9	50	32	9	3,5	yes	no	1,75	OF..1505.N
030.1263.020	125	133,9	63	40	11	3,5	yes	no	3,43	OF..1505.N
030.1663.020	160	168,9	63	40	13	3,5	yes	no	5,84	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
030.6340.010	63	74,2	40	22	5	5,0	yes	yes	0,55	OF..2006.N
030.8050.012	80	91,3	50	27	6	5,0	yes	yes	1,11	OF..2006.N
030.1050.010	100	111,0	50	32	7	5,0	yes	yes	2,10	OF..2006.N
030.1263.010	125	136,3	63	40	8	5,0	yes	no	3,60	OF..2006.N
030.1663.010	160	171,3	63	40	10	5,0	yes	no	5,30	OF..2006.N
030.2063.010	200	211,3	63	60	12	5,0	yes	no	7,80	OF..2006.N

set wedge

08Z.0000.134

08K.1008.003

08Z.0000.231

TX220

Avantop VC1.1/VC2.2

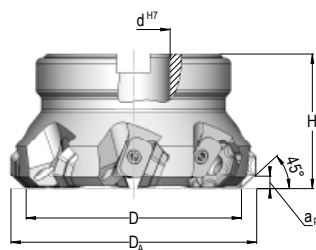
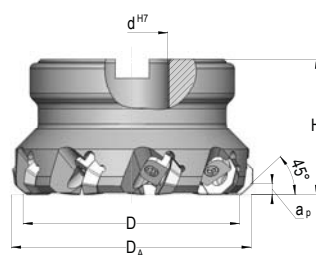
Avantop VC1.1



Avantop 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

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	0,76	OF..1505.N*
03O.8050.080	80	88,6	50	27	9	3,5	yes	no	1,52	OF..1505.N*
03O.1050.080	100	108,6	50	32	11	3,5	yes	no	2,40	OF..1505.N*
03O.1263.080	125	133,6	63	40	14	3,5	yes	no	3,80	OF..1505.N*

* without centre bore

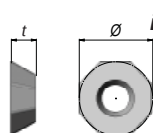
set wedge			
08Z.0000.128	08K.1205.001	08Z.0000.093	TX215

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	0,68	OF..2006.N*
03O.8050.240	80	91,3	50	27	7	5,0	yes	yes	1,46	OF..2006.N*
03O.1050.240	100	111,3	50	32	9	5,0	yes	yes	2,40	OF..2006.N*
03O.1263.240	125	136,3	63	40	11	5,0	yes	no	3,80	OF..2006.N*
03O.1663.240	160	171,3	63	40	14	5,0	yes	no	5,27	OF..2006.N*
03O.2063.240	200	211,3	63	60	18	5,0	yes	no	7,68	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

t 05 = 5,00

Ø 20 = 19,90

t 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		
	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
	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	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**

					stainless steel		
	article	AS	grade		C11	C10	C09
OF..1505..	OFEW1505M000132SN25S	8	CAN ² 26	h _{max}			
				v _c			
	OFEW1505M000130SN28S		NERO ² 77	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*		NERO ² 77	h _{max}			
				v _c			
OFER1505M003207TN28S*	SKY77	h _{max}					
		v _c					
OFER1505M003208SN25S*	CAN ² 26	h _{max}					
		v _c					
OF..2006..	OFEW2006M000132SN25S	8	CAN ² 26	h _{max}			
				v _c			
	OFEW2006M000130SN28S		NERO ² 77	h _{max}			
				v _c			
	OFEW1505M000131TN28S		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*		NERO ² 77	h _{max}			
				v _c			
OFER2006M003109TN28S*	SKY77	h _{max}					
		v _c					
OFER2006M003110SN25S*	CAN ² 26	h _{max}					
		v _c					

* without centre bore for VC

insert



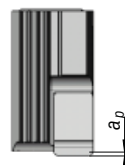
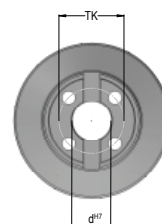
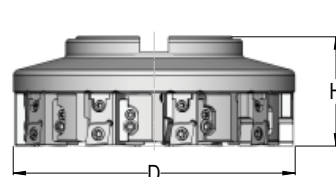
OF..1505.N	08B.4511.7991	TX220
OF..2006.N	08B.0513.7991	TX220

» Assembly instructions page 109

Finavant EK90



- < finishing cutter for best surface quality and flatness
- < economic tool because of the high feed rates
- < exact fit of the cartridge in the cutter body
- < easy setting

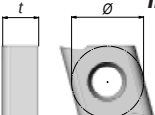


Finavant EK90

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	0,89	K-EN08
04E.0850.140	80	50	27	■	6	0,1 - 0,3	yes	1,47	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	2,50	K-EN08-g
04E.1260.001	125	62	40	■	8	0,1 - 0,3	no	4,00	K-EN12
04E.1260.005	125	62	40	■	8	0,1 - 0,3	no	4,00	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	5,73	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.

<i>insert</i>	incircle diameter	insert thickness
	Ø 08 = 8,00 Ø 12 = 12,70	t T3 = 4,00 t 08 = 8,00

Allocation from machining parameters of AV material groups

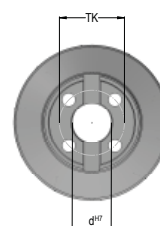
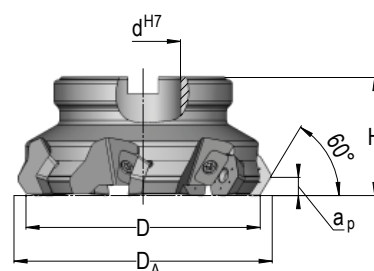
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
EN..08T3..	ENFQ08T31006304EL33S	2	SKY77	h _{max}	3,0								
				v _c	10 - 400 - vibration depending / surface depending								
			NERO26	h _{max}	3,0								
				v _c	10 - 400 - vibration depending / surface depending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

<i>insert</i>		
EN..08T3.L	08B.0375.7991	TX208
EN..08T3.L for K-EN08-g	08B.0309.7991	TX208
EN..1208.L	08B.0516.7991	TX220

Face milling cutter HE60

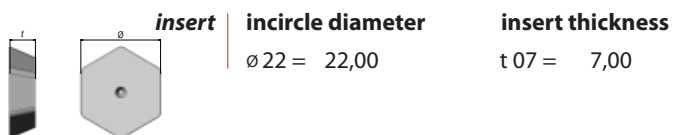


- < suitable for roughing and finishing with the same 6 cutting edge HE - insert
- < large depth of cut
- < easy indexing due to the wedge system



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	3,25	HE..2207.N
03H.1663.001	160	172,8	63	40	9	10	yes	66,7	no	5,29	HE..2207.N
03H.2063.001	200	212,8	63	60	11	10	yes	101,6	no	7,29	HE..2207.N



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

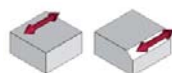


08Z.0000.242

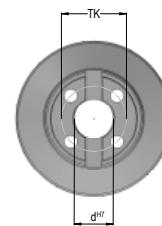
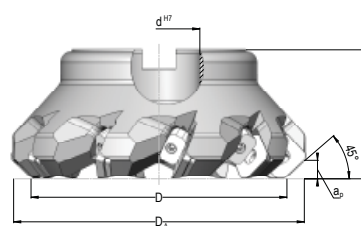


TX225

Face milling cutter SE60

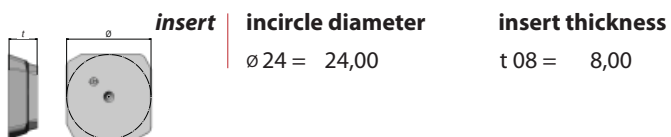


- < smooth cut at high feed rates
- < low power consumption at high metal removal rate
- < no heat build up in work piece due to the excellent chip removal



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	5,12	SE..2408.R
03S.2063.130	200	217,5	63	60	11	14	yes	101,6	no	8,94	SE..2408.R



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				

set wedge

08Z.0000.145	08K.2010.001	08Z.0000.242	TX225
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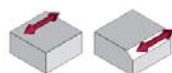
Face milling cutter SE45/SX45



Face milling cutter SE45



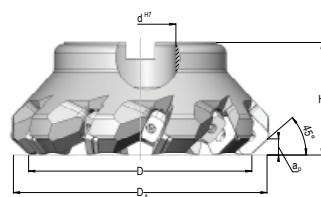
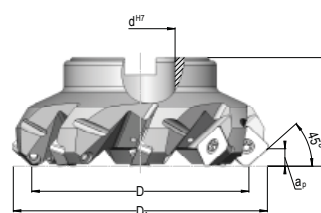
Face milling cutter SX45



< suitable for roughing and finishing with the same insert

< large depth of cut

< square insert provides stable assembling



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	1,40	SE..1506.N
03S.1050.005	100	117,0	50	32	8	8,4	yes	1,98	SE..1506.N
03S.1263.008	125	142,0	63	40	8	8,4	yes	3,10	SE..1506.N
03S.1663.007	160	177,2	63	40	12	8,4	no	5,15	SE..1506.N
03S.2063.008	200	217,4	63	60	14	8,4	no	7,20	SE..1506.N

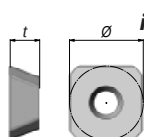
Face milling cutter SX45

article	D	D _A	H	d ^{H7}	z _{eff}	a _p	wedge	ic	Kg	insert
03S.1263.030	125	145,2	63	40	10	8,8	yes	no	3,76	SX..1906.N
03S.1663.030	160	180,4	63	40	12	8,8	yes	no	6,12	SX..1906.N
03S.1663.031	160	180,2	63	40	16	8,8	yes	no	6,10	SX..1906.N

set wedge SX45

08Z.0000.126	08K.1908.001	08Z.0000.093	TX215
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**insert****incircle diameter****insert thickness**

Ø 15 = 15,88

t 06 = 6,35

Ø 19 = 19,00

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
SE..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			
			NERO26	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		
			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

Signavant SN75/SN87

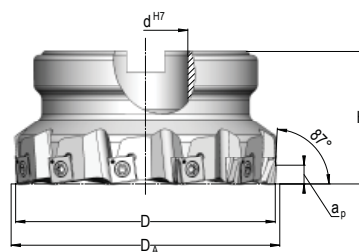
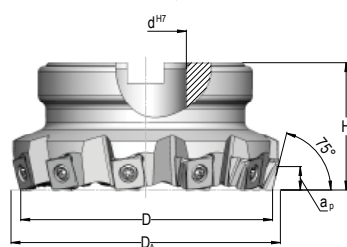
Signavant SN75



Signavant SN87+



- < for machining cast iron, extreme soft and free cutting
- < economic machining through eight cutting edge tangential SNHX insert
- < large depth of cut allows high volumes of metal removal
- < high process reliability



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	1,34	SN..1208.L
03S.1050.090	100	105,8	50	32	11	5,5	no	2,15	SN..1208.L
03S.1263.090	125	130,8	63	40	14	5,5	no	3,50	SN..1208.L
03S.1663.090	160	165,8	63	60	17	5,5	no	5,20	SN..1208.L
03S.2063.090	200	205,8	63	60	20	5,5	no	9,10	SN..1208.L

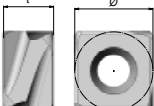
Signavant SN87

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	0,58	SN..1006.L
03S.0640.100	63	64,4	40	22	8	5,0	no	0,60	SN..1006.L
03S.0850.100	80	81,4	50	27	10	5,0	no	1,46	SN..1006.L
03S.0850.111	80	81,6	50	27	8	7,0	no	1,10	SN..1208.L
03S.1050.100	100	101,4	50	32	12	5,0	no	2,04	SN..1006.L
03S.1050.111	100	101,6	50	32	10	7,0	no	1,77	SN..1208.L
03S.1263.100	125	126,4	63	40	14	5,0	no	3,40	SN..1006.L
03S.1263.111	125	126,6	63	40	12	7,0	no	2,94	SN..1208.L
03S.1663.100	160	161,4	63	40	20	5,0	no	5,30	SN..1006.L
03S.1663.111	160	161,6	63	40	16	7,0	no	5,14	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	0,27	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	1,46	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	2,04	SN..1006.L
03S.1263.101	125	126,4	63	40	23	5,0	no	3,40	SN..1006.L

* attention to different screw lengths

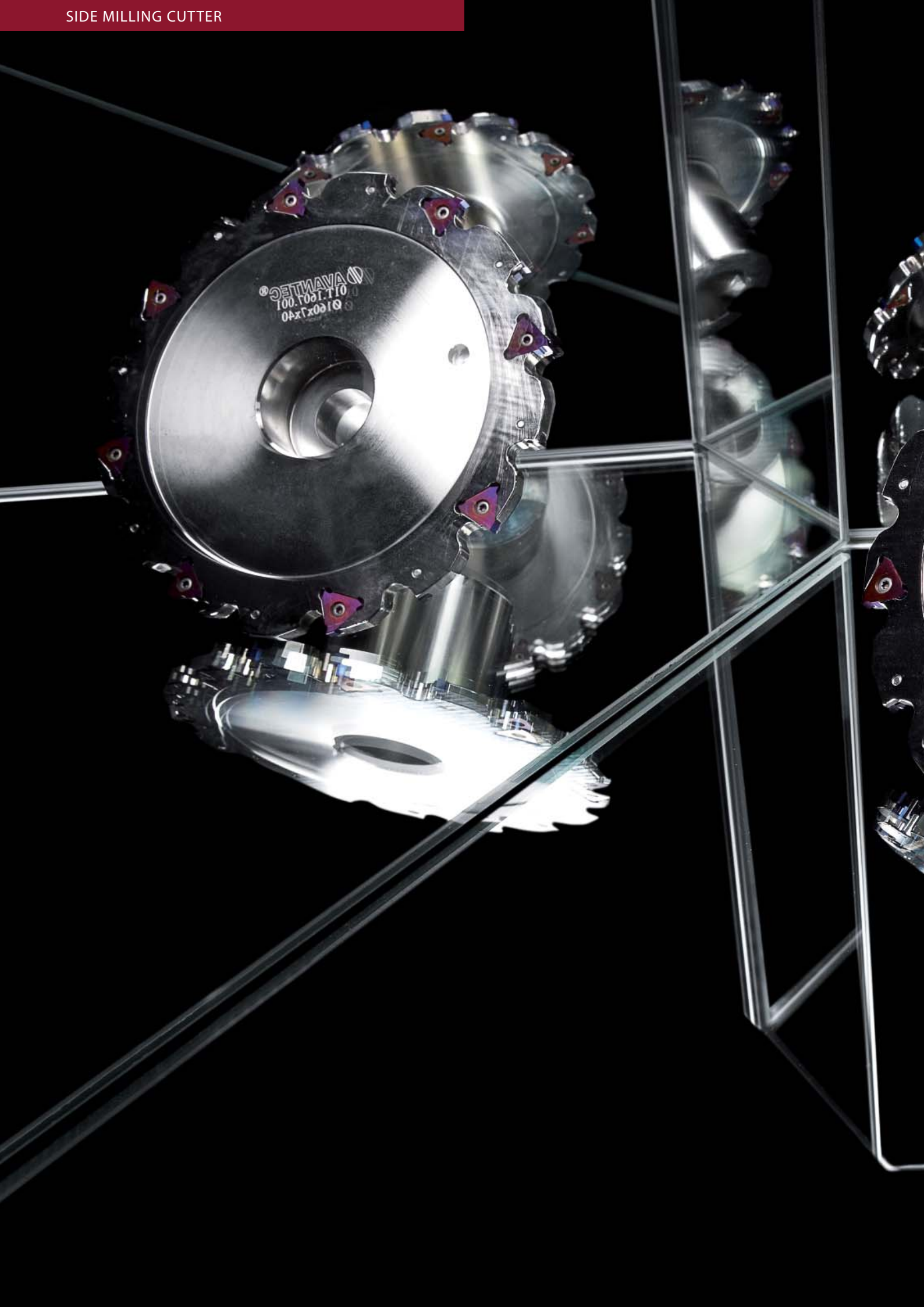
	insert	incircle diameter	insert thickness
		Ø 10 = 10,00	t 06 = 6,00
		Ø 12 = 12,50	t 08 = 8,00

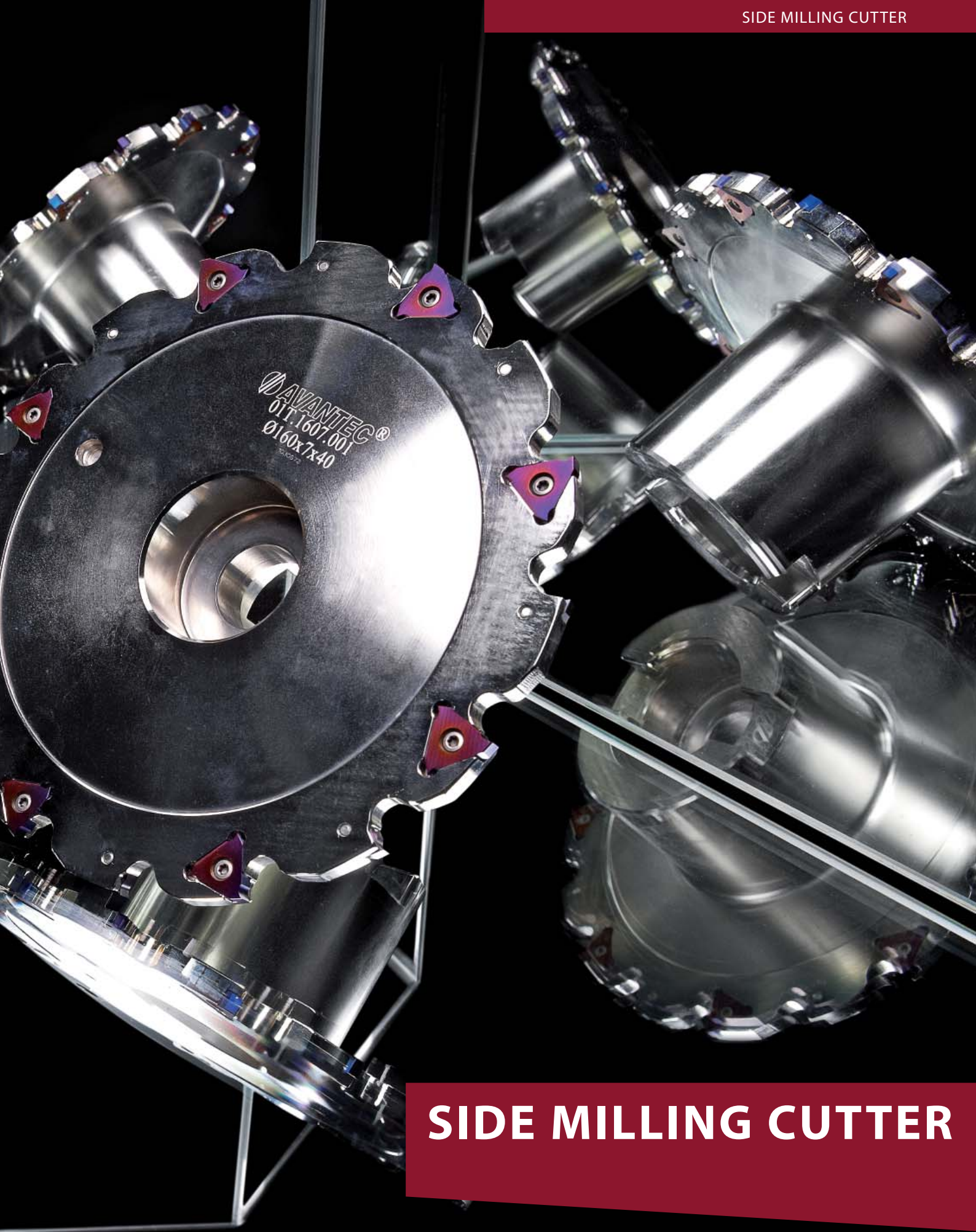
**Allocation from machining parameters
of AV material groups**

	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
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





SIDE MILLING CUTTER

Side milling cutter tangential

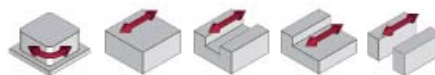
EB18/EN18



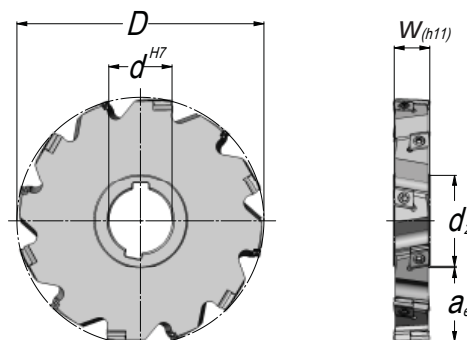
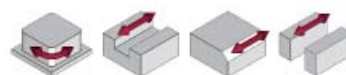
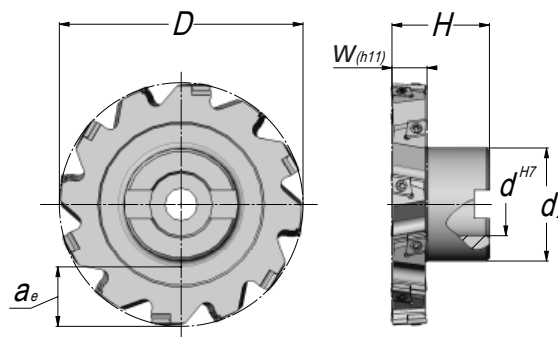
Side milling cutter EB18



Side milling cutter EN18



- < 4 cutting edge EN 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
- < possible face milling



Side milling cutter EB18

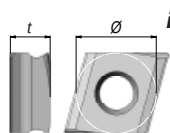
article	D	H	w _(h11)	d ^{H7}	d ₂	zz	z _{eff}	a _e	ic	Kg	insert
01E.1214.001	125	50	14	32	58	7 x 2	7	32,0	no	1,54	EN..08T3.R/L
01E.1216.001	125	50	16	32	58	6 x 2	6	32,0	no	1,64	EN..0904.R/L
01E.1218.001	125	50	18	32	58	6 x 2	6	32,0	no	1,73	EN..0904.R/L
01E.1614.001	160	63	14	40	70	9 x 2	9	43,0	no	2,90	EN..08T3.R/L
01E.1616.001	160	63	16	40	70	8 x 2	8	43,0	no	3,00	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	3,60	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	5,00	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	8,70	EN..1206.R/L

other dimensions on request

Side milling cutter EN18

article	D	w _(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	1,15	EN..0904.R/L
14E.1218.001	125	18	32	46	6 x 2	6	37,0	no	1,31	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	2,10	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	2,61	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

t T3 = 3,97

Ø 09 = 9,52

t 04 = 4,76

Ø 12 = 12,70

t 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	
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			
			NERO26	h _{max}	0,22	0,2	0,18						
				v _c	280	270	260						
	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

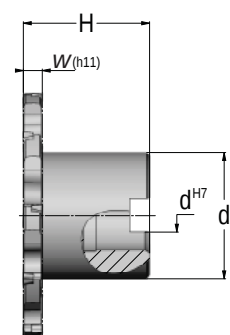
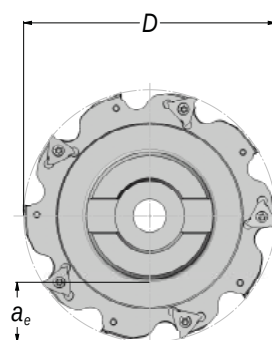


EN..08T3.R/L	08B.0309.7991	TX208
EN..0904.R/L	08B.3511.7991	TX215
EN..1206.R/L	08B.0513.7991	TX220

Detachable 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	w _(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	0,23	TC..1102.R/L
01T.0606.001	63	32	6	16	32	4 x 2	4	13,0	no	0,26	TC..1103.R/L
01T.0610.001	63	32	10	16	32	3 x 2	3	13,0	no	0,28	TN..1606.R/L
01T.0805.001	80	40	5	22	40	5 x 2	5	18,0	no	0,44	TC..1102.R/L
01T.0806.001	80	40	6	22	40	5 x 2	5	18,0	no	0,45	TC..1103.R/L
01T.0808.001	80	40	8	22	40	4 x 2	4	18,0	no	0,48	TN..1604.R/L
01T.0810.001	80	40	10	22	40	4 x 2	4	18,0	no	0,51	TN..1606.R/L
01T.0812.001	80	40	12	22	40	4 x 2	4	18,0	no	0,56	TN..1606.R/L*
01T.1005.001	100	45	5	27	45	7 x 2	7	25,0	no	0,68	TC..1102.R/L
01T.1006.001	100	45	6	27	45	7 x 2	7	25,0	no	0,68	TC..1103.R/L
01T.1008.001	100	45	8	27	45	5 x 2	5	25,0	no	0,77	TN..1604.R/L
01T.1010.001	100	45	10	27	45	5 x 2	5	25,0	no	0,84	TN..1606.R/L
01T.1012.001	100	45	12	27	45	5 x 2	5	25,0	no	0,92	TN..1606.R/L*
01T.1205.001	125	50	5	32	58	9 x 2	9	32,0	no	1,15	TC..1102.R/L
01T.1206.001	125	50	6	32	58	9 x 2	9	32,0	no	1,23	TC..1103.R/L
01T.1208.001	125	50	8	32	58	6 x 2	6	32,0	no	1,30	TN..1604.R/L
01T.1210.001	125	50	10	32	58	6 x 2	6	32,0	no	1,38	TN..1606.R/L
01T.1212.001	125	50	12	32	58	6 x 2	6	32,0	no	1,56	TN..1606.R/L*
01T.1606.001	160	63	6	40	68	11 x 2	11	44,0	no	2,04	TC..1103.R/L
01T.1607.001	160	63	7	40	68	8 x 2	8	44,0	no	2,08	TN..16T3.R/L
01T.1608.001	160	63	8	40	68	8 x 2	8	44,0	no	2,20	TN..1604.R/L
01T.1609.001	160	63	9	40	68	8 x 2	8	44,0	no	2,25	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

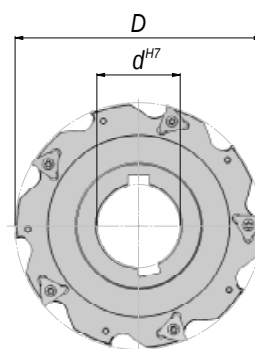


< a balanced smooth cut is provided by using right and left inserts

< very precise width of cut

< high precision of radial and axial run out

< triangular housing of the T-form insert

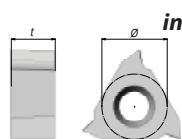


Side milling cutter TN18

article	D	w _(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	0,10	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	0,15	TC..1102.R/L
14T.0806.001	80	6	27	40	5 x 2	5	18,0	no	0,18	TC..1103.R/L
14T.0810.001	80	10	27	40	4 x 2	4	18,0	no	0,27	TN..1606.R/L
14T.1005.001	100	5	32	46	7 x 2	7	25,0	no	0,25	TC..1102.R/L
14T.1006.001	100	6	32	46	7 x 2	7	25,0	no	0,30	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	0,41	TC..1102.R/L
14T.1206.001	125	6	32	46	9 x 2	9	37,0	no	0,50	TC..1103.R/L
14T.1207.001	125	7	32	46	6 x 2	6	37,0	no	0,53	TN..16T3.R/L
14T.1208.001	125	8	32	46	6 x 2	6	37,0	no	0,65	TN..1604.R/L
14T.1209.001	125	9	32	46	6 x 2	6	37,0	no	0,70	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	0,94	TN..1606.R/L *
14T.1606.001	160	6	40	55	11 x 2	11	50,0	no	0,82	TC..1103.R/L
14T.1607.001	160	7	40	55	8 x 2	8	50,0	no	0,88	TN..16T3.R/L
14T.1608.001	160	8	40	55	8 x 2	8	50,0	no	1,00	TN..1604.R/L
14T.1609.001	160	9	40	55	8 x 2	8	50,0	no	1,16	TN..1604.R/L *
14T.1610.001	160	10	40	55	8 x 2	8	50,0	no	1,28	TN..1606.R/L
14T.1612.001	160	12	40	55	8 x 2	8	50,0	no	1,56	TN..1606.R/L *
14T.2007.001	200	7	40	55	10 x 2	10	70,0	no	1,46	TN..16T3.R/L
14T.2008.001	200	8	40	55	10 x 2	10	70,0	no	1,61	TN..1604.R/L
14T.2009.001	200	9	40	55	10 x 2	10	70,0	no	1,90	TN..1604.R/L *
14T.2010.001	200	10	40	55	10 x 2	10	70,0	no	2,20	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	3,13	TN..1606.R/L
14T.2512.001	250	12	50	68	12 x 2	12	89,0	no	3,82	TN..1606.R/L *

other dimensions on request

* attention to different screw lengths



insert

incircle diameter

insert thickness

Ø 11 = 6,35

t 02 = 2,60

Ø 16 = 9,52

t 03 = 3,20

t T3 = 3,97

t 04 = 4,76

t 06 = 6,40

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					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						

<i>insert</i>		
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

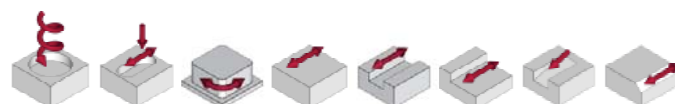
» Assembly instructions page 109





COPY MILLING CUTTER

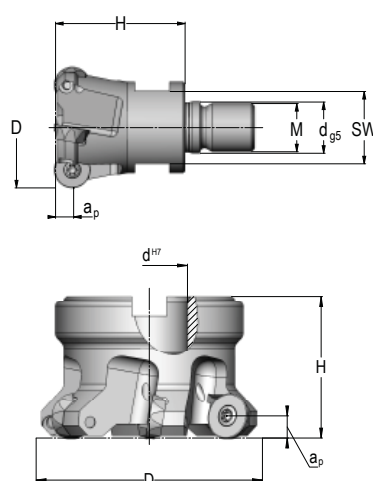
Copy milling cutter RO18



< RDGX insert with facets prevents twisting and defines position while indexing

< axial and radial cutting edges guarantee a soft and free cut

< starts at $\varnothing 20$ mm



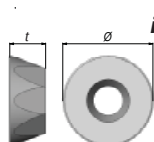
Copy milling cutter RO18 with thread

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	0,06	RD..10T3.N*
18R.2433.001	24	33	12,5	12	17	2	6,0	5,0°	no	0,10	RD..1204.N*
18R.3243.003	32	43	17,0	16	24	3	6,0	4,0°	no	0,22	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	0,35	RD..1204.N
18R.5050.002	50	50	22	5	5,0	3,0°	yes	0,39	RD..10T3.N
18R.5250.001	52	50	22	5	6,0	3,0°	yes	0,39	RD..1204.N
18R.5250.002	52	50	22	6	5,0	3,0°	yes	0,39	RD..10T3.N
18R.6350.001	63	50	27	5	8,0	3,0°	yes	0,53	RD..1605.N
18R.6650.001	66	50	27	5	8,0	4,0°	yes	0,55	RD..1605.N
18R.6650.005	66	50	27	8	5,0	4,0°	yes	0,65	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	1,45	RD..1605.N
18R.1263.001	125	63	40	8	8,0	2,0°	yes	3,15	RD..1605.N

**insert****incircle diameter****insert thickness**

Ø 10 = 10,00

t T3 = 3,97

Ø 12 = 12,00

t 04 = 4,76

Ø 16 = 16,00

t 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



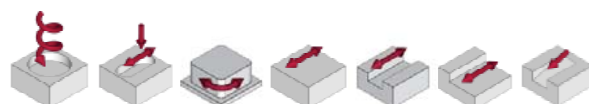
RD..10T3.N	08B.0309.7991	TX208
RD..10T3.N*	08B.0363.7991	TX208
RD..1204.N	08B.3509.7991	TX215
RD..1204.N*	08B.3578.7991	TX215
RD..1605.N	08B.0513.7991	TX220

* attention to different screw lengths

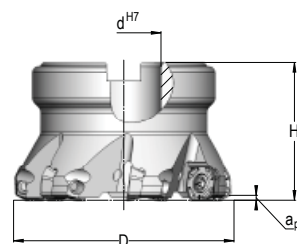
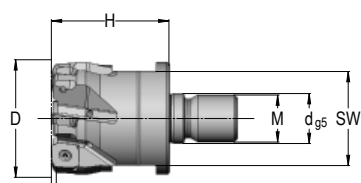
» Technical information ramp page 103

» Technical information f_z adjustment page 103

Primavant UP90



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



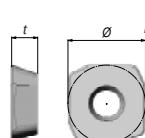
Primavant UP90 with thread

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	0,22	UE..0903.R
18U.3540.032	35	40	17	16	27	4	1,0	4,0°	no	yes	0,24	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	0,35	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	0,40	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	1,25	UE..1204.R
18U.1050.001	100	50	32	7	2,5	■	yes	no	2,00	UE..1506.R
18U.1263.001	125	63	40	8	2,5	■	yes	no	2,98	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

t 03 = 3,20

Ø 12 = 12,70

t 04 = 4,76

Ø 15 = 15,90

t 06 = 6,35

Allocation from machining parameters of AV material groups

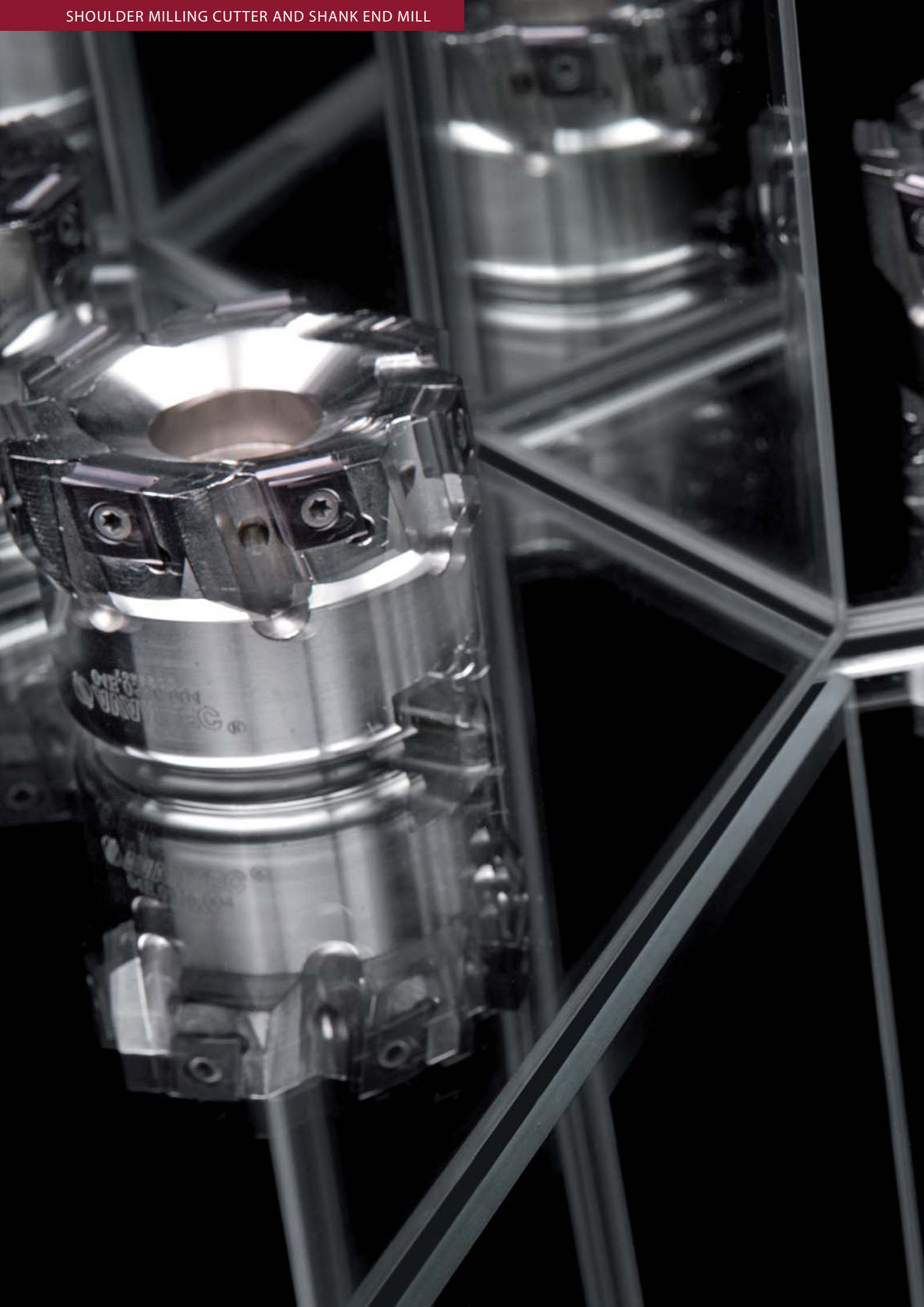
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
UE..0903..	UEGW09031001610SR25	4	NERO ² 77	f _z	1,8	1,5	1	1,8	1,8	1,5	1,5	1,2	
				v _c	280	260	250	280	260	250	240	220	
	UEGW09031001611TR28	4	NERO ² 77	f _z	1,6	1,3	0,8	1,6	1,6	1,3	1,3	1	
				v _c	280	260	250	280	260	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	4	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	4	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	4	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	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
			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 ramp page 103

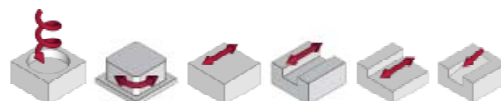
» Information "theoretical corner radius" Primavant UP90 page 104





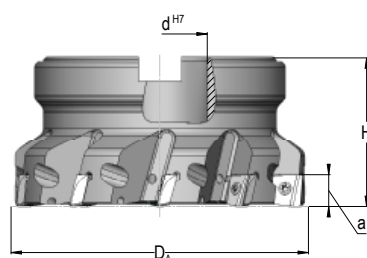
SHOULDER MILLING CUTTER AND SHANK END MILL

Megavant HC90



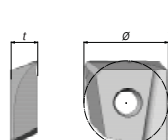
< specially qualified to machine difficult materials
(stainless, titanium etc.)

< 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	0,20	MO..1003.R
04M.0540.150	50	40	22	6	8,0	0,8°	yes	0,35	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	1,17	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	t 03 = 3,60
		Ø 12 = 12,70	t 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..	MOGU12T31008101TR28	2	SKY77	h _{max}	0,25	0,2	0,18	0,22	0,2	0,18			
				v _c	240	230	220	240	230	220			
	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

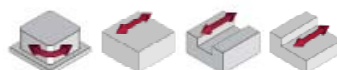
Allocation from machining parameters of AV material groups

	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..	MOGU12T31008101TR28	2	SKY77	h _{max}				0,1	0,3
				v _c				60-70	250-650
	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

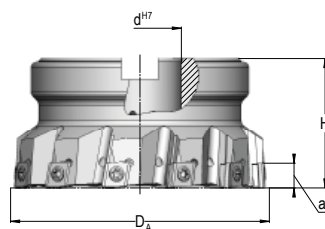
insert		
MO..1003.R	08B.0309.001	TX208
MO..12T3.R	08B.0309.001	TX208

» Technical information ramp page 103

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

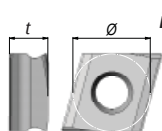


Shoulder milling cutter EP90

article	D	H	d ^{H7}	z _{eff}	a _p	ic	Kg	insert
04E.0432.001	40	32	16	5	7,5	yes	0,20	EN..08T3.L
04E.0536.001	50	36	22	5	9,0	yes	0,33	EN..0904.L
04E.0640.005	63	40	22	5	12,0	yes	0,56	EN..1206.L
04E.0850.001	80	50	27	7	12,0	yes	1,22	EN..1206.L
04E.1050.001	100	50	32	8	12,0	yes	1,70	EN..1206.L
04E.1263.001	125	63	40	10	12,0	yes	3,55	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	0,35	EN..08T3.L
04E.0640.001	63	40	22	7	9,0	yes	0,60	EN..0904.L
04E.0640.006	63	40	22	9	7,5	yes	0,52	EN..08T3.L
04E.0850.004	80	50	27	10	9,0	yes	1,24	EN..0904.L
04E.0850.016	80	50	27	12	7,5	yes	1,28	EN..08T3.L
04E.1050.003	100	50	32	12	9,0	yes	1,68	EN..0904.L
04E.1050.004	100	50	32	12	12,0	yes	1,70	EN..1206.L
04E.1263.003	125	63	40	13	9,0	yes	3,60	EN..0904.L
04E.1263.007	125	63	40	15	12,0	yes	3,32	EN..1206.L



insert	incircle diameter	insert thickness
	ø 08 = 8,00	t T3 = 3,97
	ø 09 = 9,52	t 04 = 4,76
	ø 12 = 12,70	t 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
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
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
EN..0904..	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		
			NERO26	h _{max}	0,18	0,15	0,12						
				v _c	280	270	260						

* 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			
			NERO26	h _{max}	0,22	0,2	0,18						
				v _c	280	270	260						

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

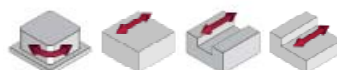
insert



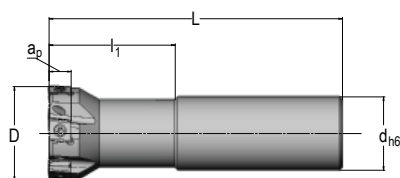
EN..08T3.L	08B.0309.7991	TX208
EN..0904.L	08B.3509.7991	TX215
EN..1206.L	08B.0513.7991	TX220

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Shank end mill CS90

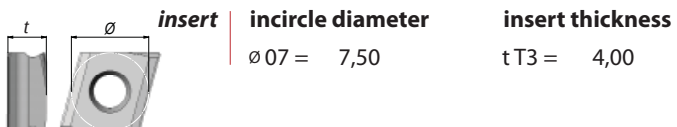


- < highest break resistance because of tangential build in 4 cutting edge CN insert
- < guaranteed 4 cutting edges in case of smaller CN insert
- < high DOC and high feed rates at once
- < fine pitch brings advantage for cast iron machining



Shank end mill CS90

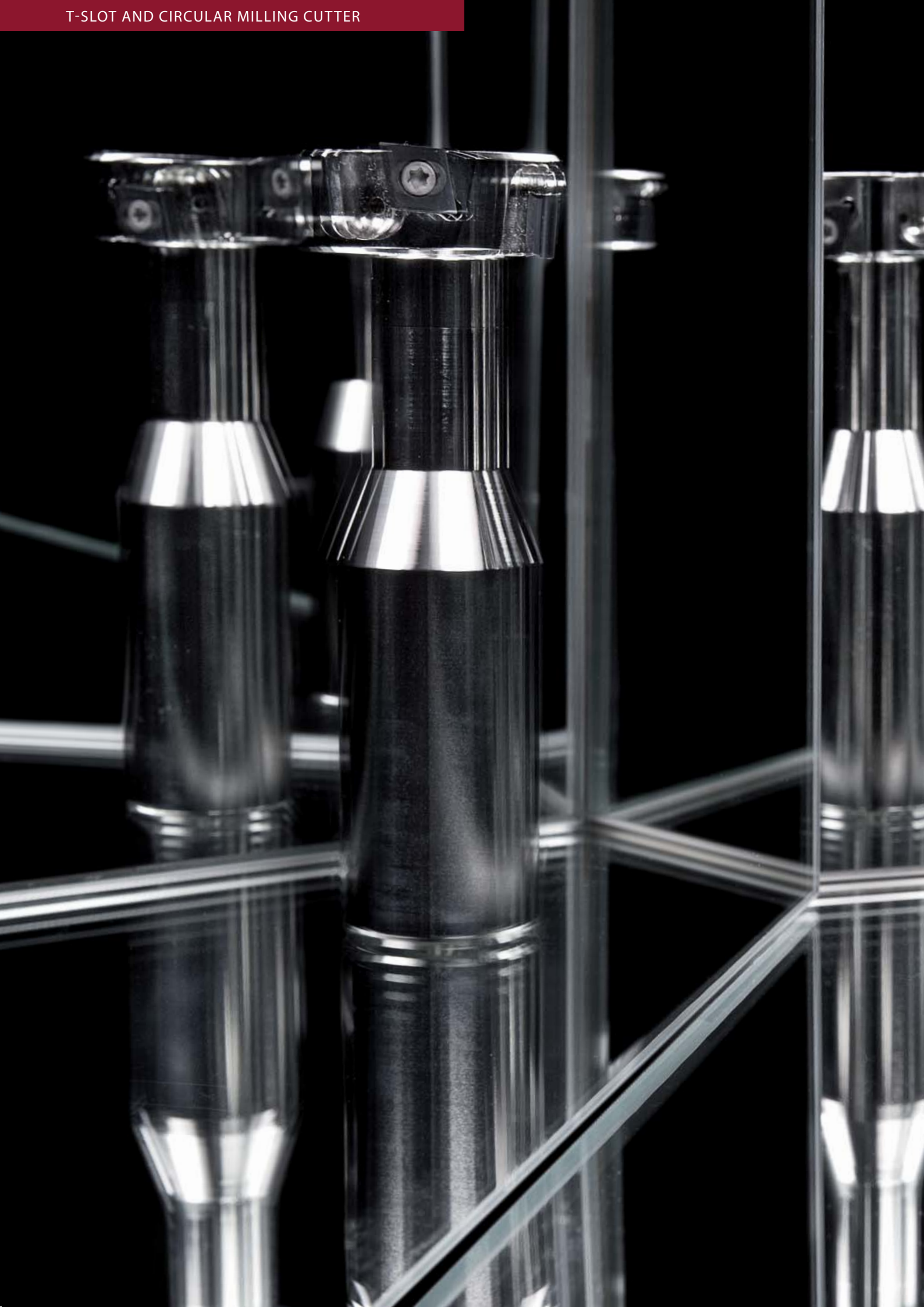
article	D	l ₁	d _{h6}	L	z _{eff}	a _p	ic	Kg	insert
11C.2509.001	25	31,5	25	90	4	7,0	yes	0,30	CN..07T3.L
11C.3210.001	32	43,0	25	100	5	7,0	yes	0,37	CN..07T3.L
11C.4011.001	40	48,5	32	110	6	7,0	yes	0,67	CN..07T3.L



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						

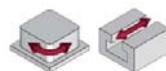
insert		
CN..07T3.L	08B.0309.7991	TX208



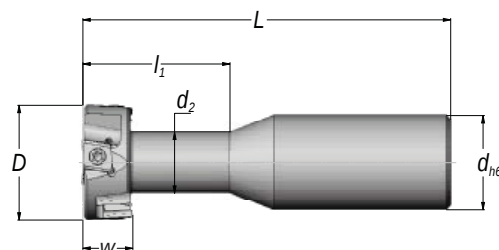


T-SLOT AND CIRCULAR MILLING CUTTER

T-slot milling cutter ET90



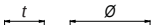
- < 4 cutting edge EN insert
- < high performance slotting cutter following DIN 650 parameters
- < tangential insert style enables optimal chip removal



T-slot milling cutter ET90

article	D	d ₂	w	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	0,53	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	0,83	EN..08T3.R/L

smaller diameter see page 84-85

	insert	incircle diameter	insert thickness
		$\varnothing 08 = 8,00$ $\varnothing 09 = 9,52$	$t T3 = 3,97$ $t 04 = 4,76$

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..	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

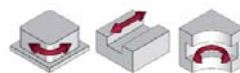
insert



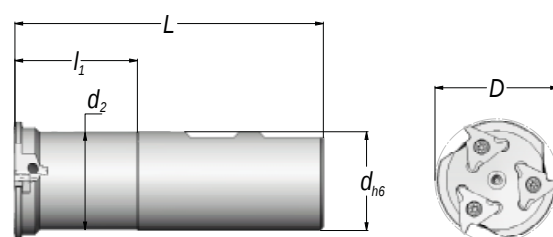
EN..08T3.R/L	08B.0309.7991	TX208
EN..0904.R/L	08B.3509.7991	TX215

» Assembly instructions page 108

Circular milling cutter TZ18

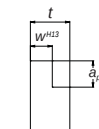
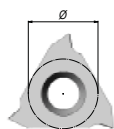


- < standard for all retaining ring grooves
- < three sided embedding for circular insert
- < precision slotting is possible



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	w	a _p	t
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
TNAX16043101802TR25	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

	article	AS	grade		cast iron			steel					
					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 109



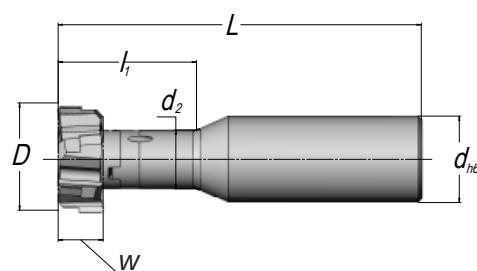


PROGRAMME

Avant-Easy-Change T-slot milling cutter ETC90



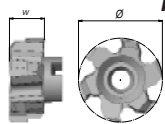
- < high performance slotting cutter following DIN 650 parameters
- < smooth running guaranteed through a perfect coupling of the insert and its slot
- < maximum replacement accuracy



Avant-Easy-Change T-slot milling cutter ETC90

article	D	d ₂	w	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 76-77

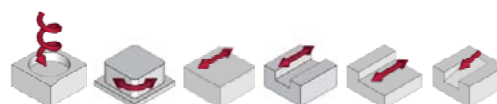
	insert	incircle diameter	insert thickness
		Ø 20 = 20,00	w 08 = 8,50
		Ø 24 = 24,00	w 10 = 10,00
		Ø 31 = 31,00	w 13 = 13,00

Allocation from machining parameters of AV material groups

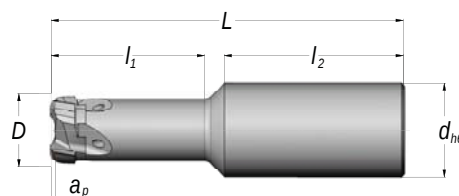
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
ECT2008..	ECT2008083201TR25	3	SKY77	h _{max}	0,1	0,08	0,05	0,1	0,1	0,08	0,05		
				v _c	180	170	160	180	180	170	160		
ECT2410..	ECT2410103301TR25	3	SKY77	h _{max}	0,1	0,08	0,05	0,1	0,1	0,08	0,05		
				v _c	180	170	160	180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

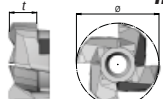


- < HPC- cutter as indexable insert system
- < optimal power transmission by cross pull-in step
- < constant accuracy while indexing
- < above average stability



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	0,58	ECK2512.R
20G.32.2135.01	25	32	150	82	61	4	0,8	2,1°	yes	0,66	ECK2512.R

	insert	incircle diameter	insert thickness
		ø 16 = 16,00 ø 25 = 25,00	t 12 = 12,00

Allocation from machining parameters of AV material groups

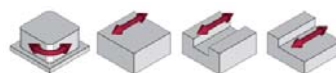
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
ECK1612..	ECK1612104202TR25	4	SKY77	h _{max}	0,8	0,6	0,5	0,8	0,7	0,6	0,5		
				v _c	240	230	220	240	240	230	220		
ECK2512..	ECK2512104501TR25	4	SKY77	h _{max}	0,8	0,6	0,5	0,8	0,7	0,6	0,5		
				v _c	240	230	220	240	240	230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

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

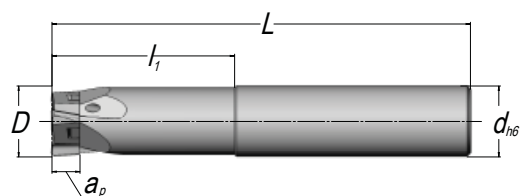
» Technical information ramp page 103

» Information "theoretical corner radius" Turbavant SP18 page104

Avant-Easy-Change Shank end mill TS90

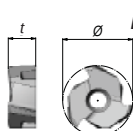


- < alternative for full carbide end mills by small DOC
- < perfect match of insert groove and drive keys
- < form and force fit pull-in step guarantees highest balance
- < variable in diameter and pitch



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	0,23	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	0,16	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	0,30	ECE2008.R

	insert	incircle diameter	insert thickness
		Ø 14 = 14,00	t 06 = 6,00
		Ø 16 = 16,00	t 08 = 8,00
		Ø 18 = 18,00	
		Ø 20 = 20,00	

Allocation from machining parameters of AV material groups

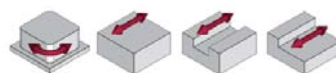
	article	AS	grade		cast iron			steel					
					D20	D18	D17	A22	A20	A18	A16	B15	B14
ECE1406..	ECE1406063201TR25	3	SKY77	h _{max}	0,16	0,14	0,12	0,16	0,15	0,13	0,12		
				v _c	240	230	220	240	240	230	220		
ECE1606..	ECE1606083201TR25	3	SKY77	h _{max}	0,18	0,16	0,13	0,18	0,16	0,14	0,13		
				v _c	240	230	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

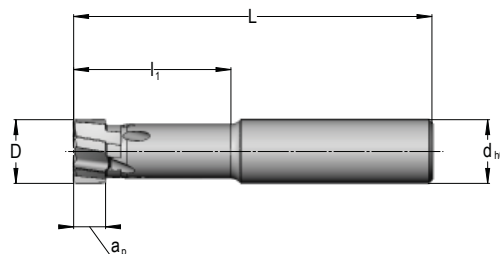


ECE1406.R	08B.3511.7991	TX215
ECE1606.R	08B.3511.7991	TX215
ECE1808.R	08B.0516.7991	TX220
ECE2008.R	08B.0516.7991	TX220

Avant-Easy-Change Shank end mill XS90

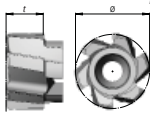


- < variable in diameter and pitch
- < optimal power transmission by cross pull-in step
- < constant accuracy while indexing



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	0,21	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
		∅ 16 = 16,00	t 12 = 12,00
		∅ 20 = 20,00	t 14 = 14,00
		∅ 25 = 25,00	t 16 = 16,00
		∅ 28 = 28,00	t 18 = 18,50

Allocation from machining parameters of AV material groups

	article	AS	grade		cast iron			steel					
					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		

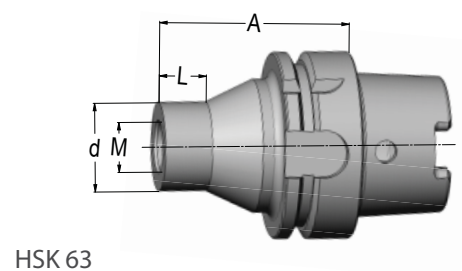
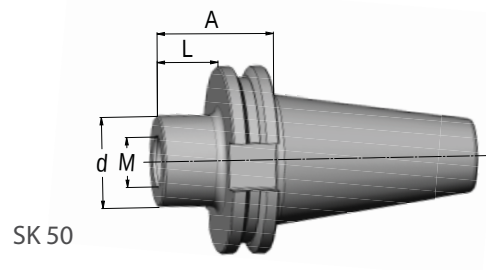
insert



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

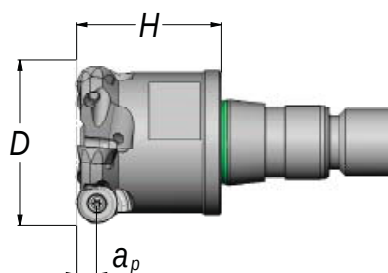


Shanks for Triloc programme

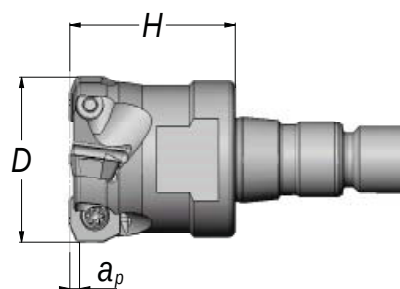
	article	d	L	M	A	Kg
SK50	09C.5018.160	30	90	16	120	3,13
	09C.6314.125	30	95	12	130	1,17
HSK63	09C.6318.160	30	89	16	125	1,10
	09C.6318.165	30	114	16	150	1,23

Triloc tool

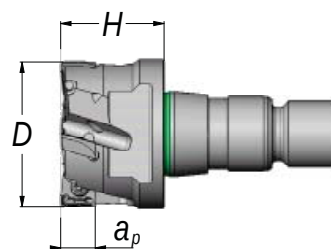
RO18-HSC



Primavant-HSC



Megavant-HSC



Tools for Triloc programme

	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	0,12	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	0,33	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

<i>insert</i>	incircle diameter	insert thickness
	ø 10 = 10,00	t T3 = 3,97
	ø 12 = 12,70	t 03 = 3,60
		t 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

				a _p at 1/4 from insert Ø	stainless steel			titanium	aluminium
article		AS	grade		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 ramp page 103

» Technical information f_z adjustment page 103

» Information "theoretical corner radius" Primavant page 104

**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)

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

Power (kW)

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

Rotational speed (U/min)

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

Cutting speed (m/min)

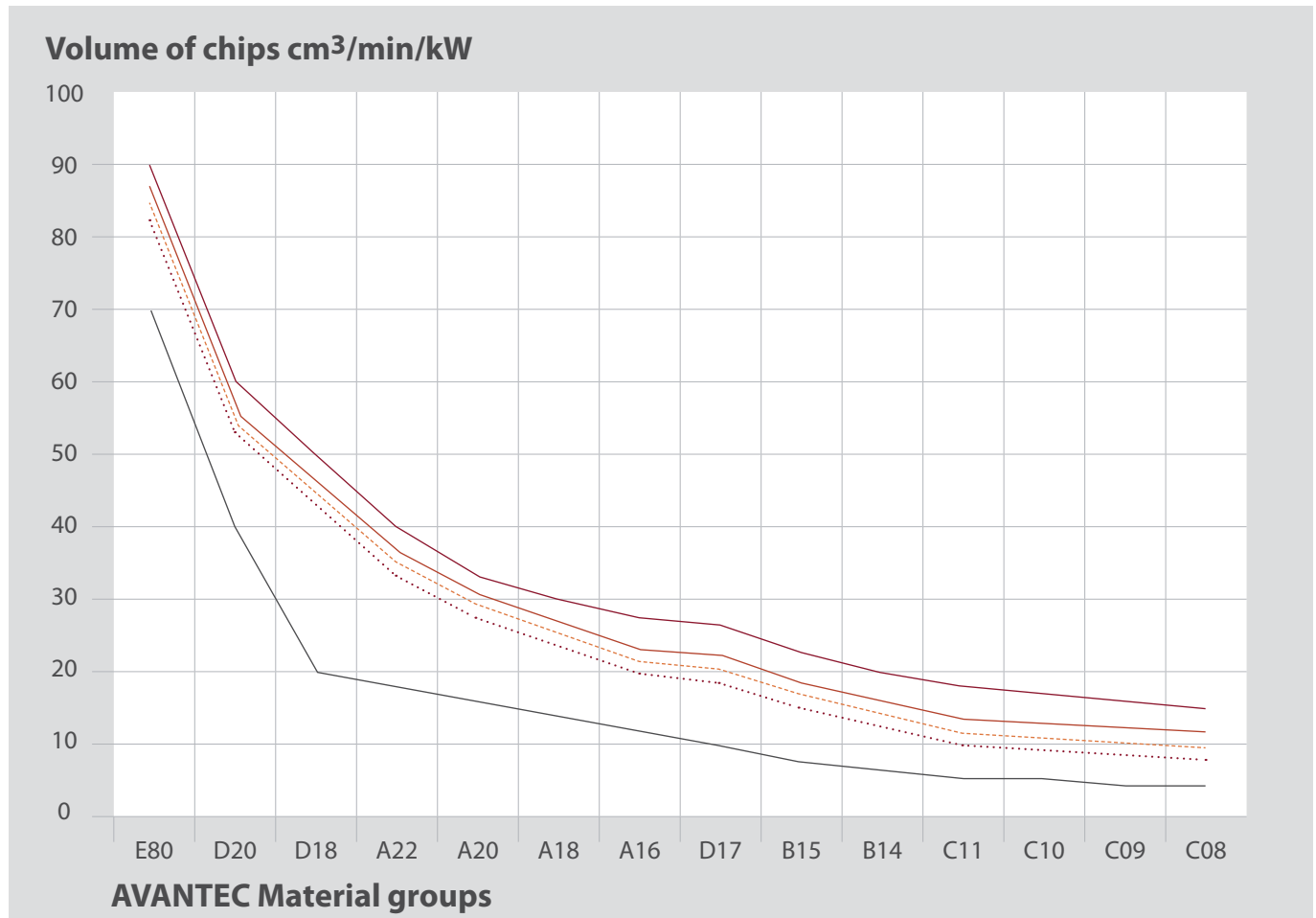
$$v_c = \frac{D \times \pi \times n}{1000}$$

Feed rate (mm/min)

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

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	
$\dot{Q}$	= chip volume	cm ³ /min
P	= power	kW
π	= Pi 3,14	
$h_{\max}$	= maximum chip thickness	mm
r	= radius	mm

Machine diagram / volume of chips



AVANTEC Insert category

- insert K1
- - - insert K2
- ... insert K3
- ... insert K4
- DIN ISO

Classification into insert categories

insert K1					
HE	OE	OF	SE	SX	UE
insert K2					
MO	RD	TC	TN		
insert K3					
CN	EC	EN	FN		
insert K4					
LN	SN				

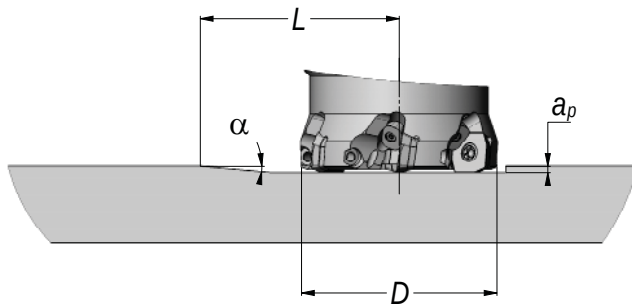
Material groups

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		01 40-00	A48 60 B		
ductile cast iron										
D18	0.7040	EN-GJS-40-15	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			
D16	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; C35	XC38TS	C36	060A35		1572	1035	1035	S35C
	1.1191	C45E; Ck45	XC42	C45	080M46		F.1140-C45K	1672	1045	S45C
A20	1.1213	C53	XC48TS	C53	060A52		C53	1674	1050	S50C
	1.5423	16Mo5		16Mo5 KG	1503-245-420		F.2602-16Mo5		4520	S8480M
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				A572 Gr.50	
	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	A204GrA	ASTM A206GrA
	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 CLA	
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	42CD4T5	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		X165CrMoV12KU	BD2		X160CrMoV12	2310	D2	
	1.3243	HS 6-5-2-5; 5 6-5-2-5	Z85WDCV	HS 6-5-2-5	BM35		HS 6-5-2-5	2723	M41	SKH55
	1.3343	HS 6-5-2C; 5 6-5-2	Z85WDCV	X82WMO605KU	BM2		HS 6-5-2	2722	M2 reg.C	SKH 51
	1.3348	HS 52-9-2; 5 2-9-2	Z100WCWV	HS 2 9 2			HS 2-9-2	2782	M7	

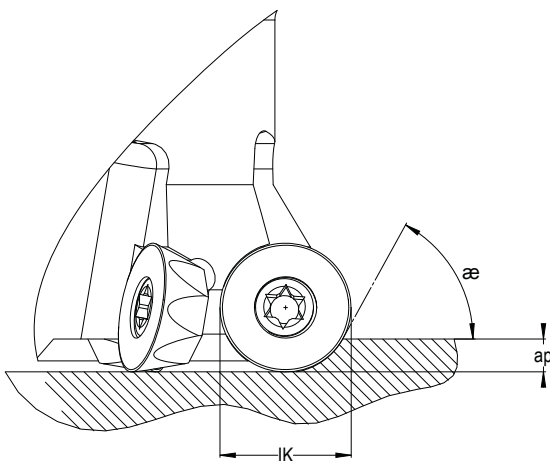
AVANTEC Material group																		
	DIN no. material		AFNOR		UNI		BS		EN		UNE		SS		AISI/SAE		JIS	
stainless steel and heat resistant steel (martensitic)																		
C11	1.4000	X6Cr13	Z8C13		X6Cr13		403S17			F.3110-X6Cr13		2301		403		SUS403		
	1.4006	X12Cr13; X10Cr13	Z10C14		X12Cr13		410S21		56A	F.3401		2302		410		SUS410		
C10	1.4034	X46Cr13	Z40CM		X40Cr14		420S45		56D	F.3405				420		SUS420J2		
	1.4057	X17CrNi16-2	Z15CrNi6.02		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	Z45CS9		X45CrSi8		401S45		52	F.322				HW3		SUH1		
C11	1.4724	X10CrAlSi13; X10CrAl13	Z10C13		X101CrAl12					F.311				405		SUS405		
	1.4742	X10CrAlSi18; X10CrAl18	Z10CA518		X8Cr17				60	F.3153-X10CrAl1813						SUH21		
C10	1.4747	X80CrNiSi20	Z80CSN20.02		X80CrSiNi20		443S65		59	F.3222-X80CrSiNi20-02				SAE HNV 6		SUH4		
C11	1.4762	X10CrAlSi25; X10CrAl24	Z10CA524		X16Cr26							2322		446		SUH446		
stainless steel and heat resistant steel (austenitic)																		
C09	1.4301	X5CrNi18-10; X5CrNi18-9	Z6CrNi18.09		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	Z2CrNi18.10		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	Z2CrNi18.10		X2CrNi18-11		304S61			F.3541-X2CrNiMo1810		2371		304LN		SUS304LN		
	1.4350	X5CrNi18-9	Z6CrNi18.09		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	Z6CrNiNb18.10		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	Z15CrNiS20.12				309S24											
	1.4845	X8CrNiZ5-12; X12CrNiZ5-21	Z12CNZ5 20		X6CrNiZ5-21		310S24			F.331		2361		310S		SUH310		
	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

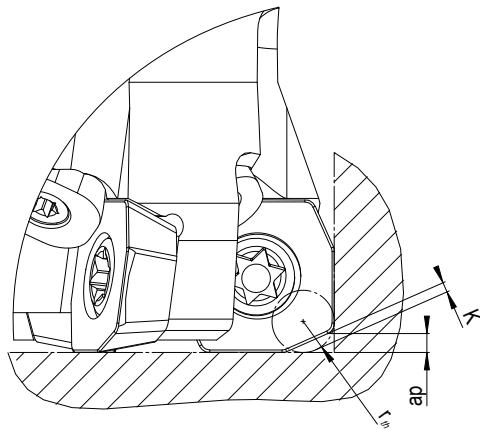


- By machining with round inserts and increasing the depth of cut a_p the feed per tooth f_z should be corrected.
- The chip thickness h_{max} and the resulting entering angle α by round inserts is depending on the depth of cut a_p .

dependence from depth of cut a_p and entering angle α

Theoretical corner radius

Primavant UP90

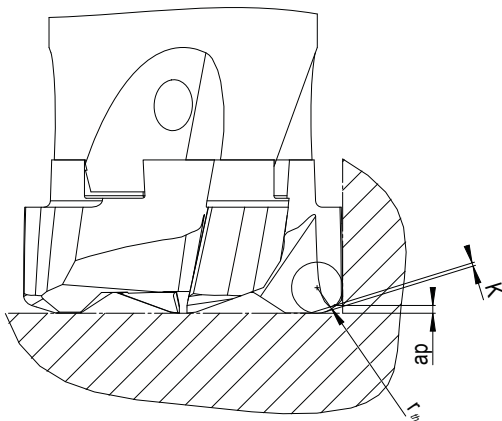


Programming information:

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 to 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 to the programmed profile.

Fastening torques

Torx fixing screws:

thread	article	screw length	fastening torque	screwdriver
M2,5	08B.25__7991	to 3,5	9 Ndm	TX208
	08B.25__7991	from 3,6	12 Ndm	TX208
M3,0	08B.03__7991	to 3,5	12 Ndm	TX208
	08B.03__7991	from 3,6	20 Ndm	TX208
M3,5	08B.35__7991	to 4,0	20 Ndm	TX215
	08B.35__7991	from 4,1	33 Ndm	TX215
M4,0	08B.04__7991	-	48 Ndm	TX215
M4,5	08B.45__7991	-	65 Ndm	TX220
M5,0	08B.05__7991	-	78 Ndm	TX220
M6,0	08B.06__7991	to 24	80 Ndm	TX225
	08B.06__7991	from 25	100 Ndm	TX225

Double thread screws:

thread	article		fastening torque	screwdriver
M5,0	08Z.0000.010		14 Ndm	TX208
M5,0	08Z.0000.231	lefthand thread	50 Ndm	TX220
M6,0	08Z.0000.093	lefthand thread	35 Ndm	TX215
M8,0	08Z.0000.242		80 Ndm	TX225

Acceptable for Torx screwdriver:

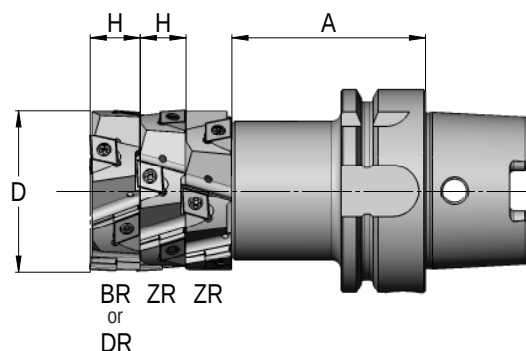
screwdriver		fastening torque
TX208	max.	16 Ndm
TX215	max.	55 Ndm
TX220	max.	85 Ndm
TX225	max.	120 Ndm

Center screws:

thread	article	fastening torque	1/2" socket for DIN6912	allen key for DIN6912
M8	08Z.08__6912	50	GN 6-3	G 6
M12	08Z.12__6912	90	GN 10-3	G 10
M14	08Z.14__6912	100	GN 12-3	G 12
M16	08Z.16__6912	140	GN 14-3	G 14
M20	08Z.20__6912	160	GN 17-3	G 17
M24	08Z.24__6912	500	-	G 19

Order information

Multiring EM90/FM90



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 you have selected as in the following example for Multiring D = 50 mm:

4 intermediate rings (ZR)

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 off in the classical way)						
corrected length center screw =						90 mm

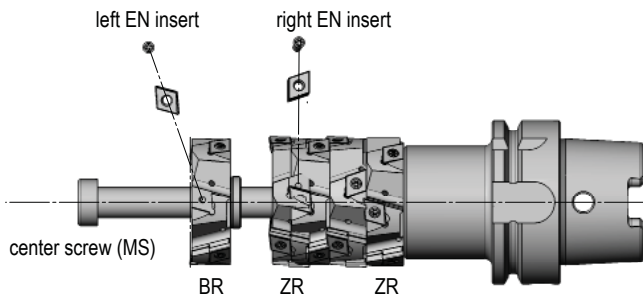
The first two calculated digits are "90" (90 mm). The correct article no. in our example would be 08Z.1209.6912 (length 120 mm article no. 08Z.1212.6912).

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

D	center screw	article no. center screw	max. no. of milling tool	max. no. of cutting rings	x- dimension	1/2" socket for DIN6912	allen key for DIN6912
32	M8	08Z.08_..6912	111	11	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

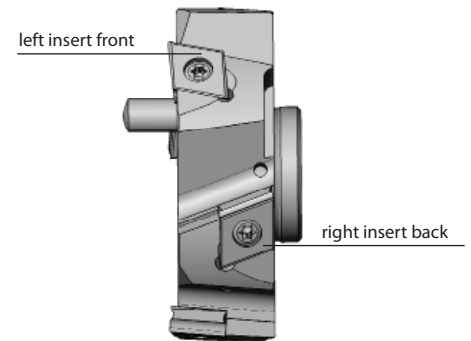
* double cutting ring

Assembly of the intermediate, bottom or double cutting ring



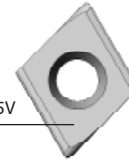
1. The intermediate rings fitted with indexable inserts are stacked one after another onto the shank. A dowel pin is used to ensure correct positioning. The intermediate rings are interchangeable.
2. The bottom or double ring forms the end of the complete cutting unit.
3. The appropriate center screw (MS) is inserted through the entire cutting unit and screwed in until the specified torque has been reached (see page 105/table).

Assembly the EN/FN indexable insert



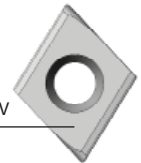
cutting edge on the left side

► left EN-insert
ENHQ12061002718SL25V



cutting edge on the right side

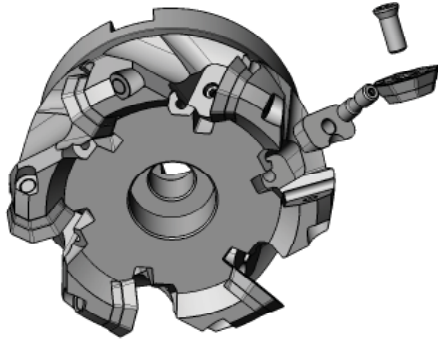
► right EN-insert
ENHQ12060002619SR25V



1. Place the indexable insert on the insert seat. Ensure that the left and the right cutting EN/FN inserts are mounted on the correct seats (see assembly diagram).
2. Screw in the fixing screw. Note that this may cause the insert to „rise“. To correct this, press the 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 105).

- 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 the OF indexable insert

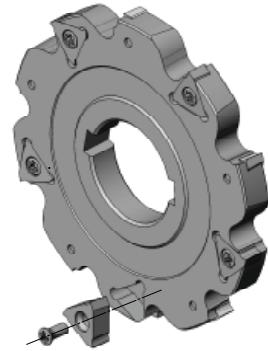


1. Turn the double-threaded screw half to release the wedge.
2. Place the insert onto the seat and lock in place over the octagonal fixture on the tool body.
3. Tighten the wedge slightly by turning the double-threaded screw.
4. Screw down the fixing screw, overcoming the tightness until the specified torque has been reached (see the table on page 105).
(applicable to Avantop VC1.1 and VC2.2)
5. Tighten the double-threaded screw until the wedge fits snugly on the insert (see the table on page 105).
These instructions apply equally to Primavant UP90, face milling cutter SX45, HE60, SE60 and Finavant EK90.

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 105).

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

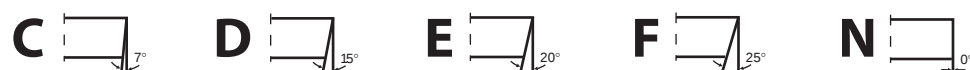
Indexable inserts - AVANTEC designation

O	F	E	W	20	06	MO	00130	S	N	28	S	NERO ² 77
1	2	3	4	5	6	7	8	9	10	11	12	13
E	N	H	Q	12	06	10	02718	S	L	25	V	SKY77

1 Insert shape



2 Lead angle



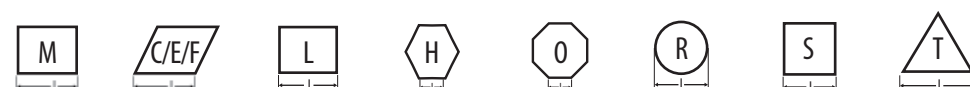
3 Tolerances (excerpt)

	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

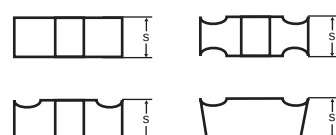
4 Machining and mounting characteristics



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



6 Insert thickness



7 Corner radius (excerpt)

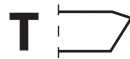
04 $r = 0,4$	lead angle on the face cutting edge	00 for diameters with specified inch dimensions converted to mm	setting angle X
08 $r = 0,8$			A = 45°
10 $r = 1,0$	F = 25°		E = 75°
25 $r = 2,5$	Z = other lead angles	M0 for diameters in metric dimensions	P = 90°



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

SKY26 / SKY77

DELPH43

ICE43

NERO26 / NERO77

ICE²43 / ICE²77

NERO²43 / NERO²77

CAN²26 / CAN²77

AVANTEC Recommendations

Problem during cutting:

AVANTEC recommendations:

flank wear:

- apply more wear resistant grade
- decrease the cutting speed
- increase the feed

small crack by the cutting edge:

- do not apply cutting fluids
- apply tougher grade

fatigue crack by the cutting edge:

- apply tougher grade
- change the feed
- apply different geometry
- change the entering and leaving of the tool

built-up edge (BUE):

- increase the cutting speed
- apply more positive geometry

brittle cracks by 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

plastic deformation:

- decrease the cutting speed
- decrease the feed
- apply more wear resistant grade

vibration:

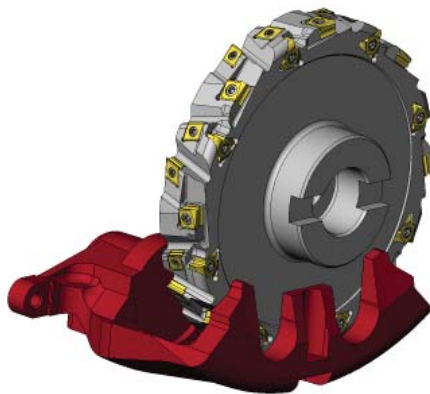
- select special-purpose geometry – W
- increase the f_z (feed/insert)
- change the machining strategy

poor surface quality:

- select special-purpose geometry – W/S
- increase the machining strategy
- reduce the f_z (feed/insert)



AVANTEC solutions



Requirements:

- machining the contact face and the brake disk slot with a single tool in 2 cuts

AVANTEC solution:

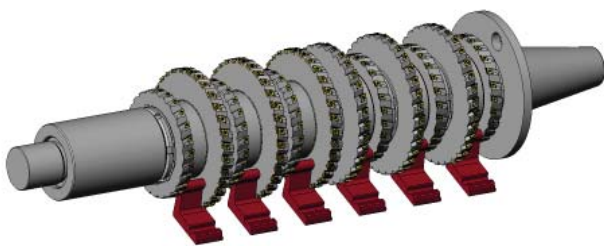
- **1 tool – 1 cut**
- ▶ 20% cycle time reduction
- ▶ 62% increase of tool life

Brake caliper

- milling the brake disk slot
- material: GJS

Special side milling cutter

- D = 206 mm
- zz = 8 x 4
- FNHQ 110508
- ENHQ 120850
- TNAX 220850



Requirements:

- extremely high milling capacity
- reduction of the strong vibrations, which in many cases are responsible for tool damages
- noise level reduction
- reduction of the change and set-up time

AVANTEC solution:

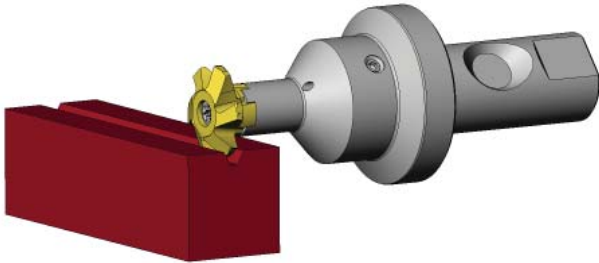
- 12 side milling cutter kit
- not adjustable system
- ▶ adjusting time can be saved
- vibrations minimized through special geometrical line-up of the edge and high positive cutting performance
- 6 work pieces in a cut with a constant dimensional stability and quality

Door hinge

- side cutting / mouth milling
- material: plain steel

Special side milling cutter kit

- D = 200 mm
- zz = 16
- FNKX 08T3R/L



Requirements:

- procession time reduction
- lowering the storage and regrinding costs
- increase of tool life

AVANTEC solution:

- Avant-Easy-Change programme
- no regrinding
- no tool breakage
- low storage costs
- no quality loss

50% reduction of milling time

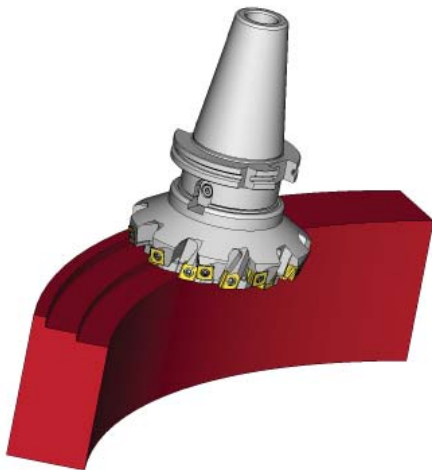
50% increase of tool life

Carrier pallet

- profile shaping
- material: titanium

Special slot milling cutter

- D = 27,5 mm
- zz = 3
- HOGX 2715ZZTR-30



Actual condition:

- 3 milling tools for 3 different cutting operations
- long processing time
- unstable setting of the work pieces
- heavy vibrations
- huge noise level

AVANTEC solution:

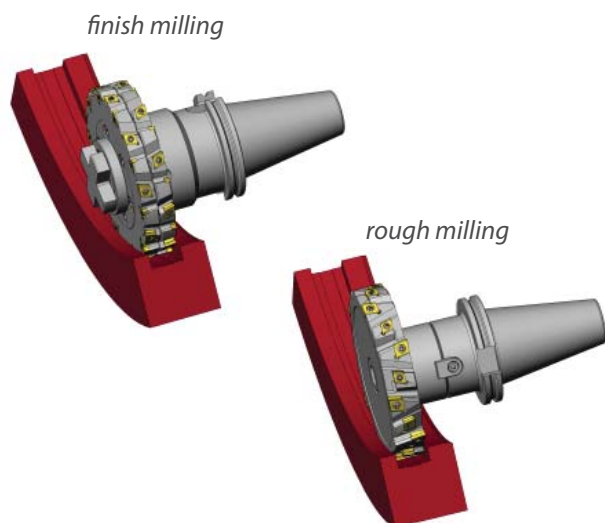
- combination tool
- **milling of 3 different contours in one cut**
 - ▶ reduction of cycle time
 - ▶ safe process, vibration-free machining
 - ▶ extremely high tool life increase

Case machining – unstable setting

- milling of a multi-stage special contour
- material: GJS

Multi-stage milling tool

- D = 140 mm/120 mm/63 mm
- zz = 10
- SNHX 120808 TL-25S
- ENHQ 120610 TL-25V
- ENHQ 090408 TL-25V



Requirements:

- reduction of processing time
- roughing and finishing with 1 tool instead of the 2 tools and 3 steps required before
- tool life increase
- no adjustable finishing cutter

AVANTEC solution:

- **special contour cutter for finishing and roughing in one step**

50% reduction of milling time

50% increase of tool life

Bearing housing

- rough and finishing milling of the bearing seat
- material: GJS500

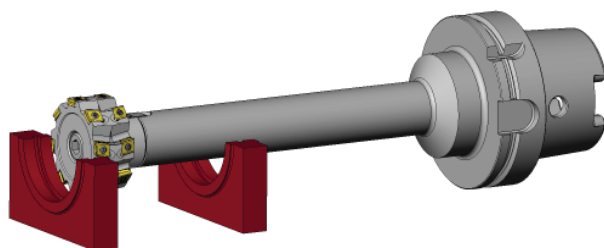
Special counter milling

finish milling

- D = 160 mm
- zz = 10 x 4
- FNHQ 100508 ER
- TNAW 160408 ER

rough milling

- D = 160 mm
- zz = 5 x 4
- ENHQ 120610 TL
- FNHQ 100508 TR



Actual condition:

- thrust bearing width milling
 - very long cantilever arm
- rough and finish milling performed by different tools
- extremely slow and high vibrated machining
- adjustable tool requires long adjusting time

AVANTEC solution:

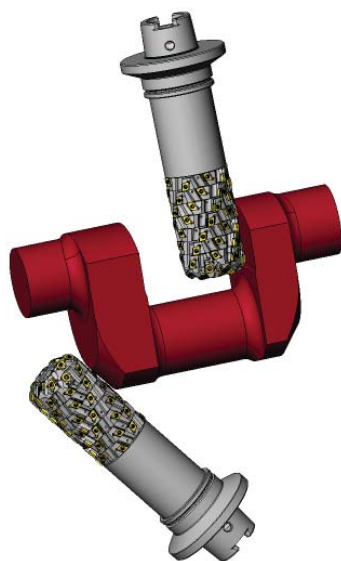
- special side milling cutter EB18 on an anti-vibration body
- rough and finish milling performed by only one tool
- possibility of extremely high feed motion

Engine block

- rough and finish milling on a 4-cylinder crankcase
- material: GJL250

Special side milling cutter EB18

- D = 57 mm
- zz = 8 x 2
- ENHQ 08T308R/L



Requirements:

- reduction of the extreme high tool costs
- increase of the milling volume
 - ▶ machining time should be reduced

AVANTEC solution:

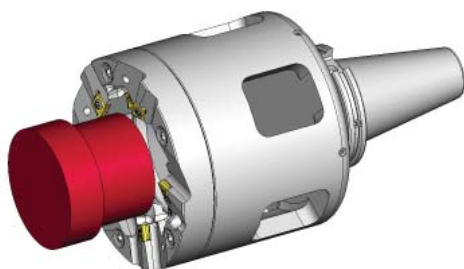
- total length of cut in one step and up to 6mm radial depth of cut
- 12 –times milling volume
- lowering of costs by using a standard solution
- modular tool system and high process safety

Large crank shaft

- milling the hub wideness and the pin chamfer
- material: 42 CrMo4

Multiring EM90

- D = 125 mm
- zz = 8 x 4
- ENHQ 160915 R/L-25
- ap = 295 mm



Requirements:

- reduction of the cycle time
- flexible system: possibility of milling different diameters through the fast and easy replacement of the cutting rings
- safety of the process

AVANTEC solution:

- fixed insert pockets
- insert with 4 cutting edges
- easy handling
- increase of the feed rate

Diameter milling of asymmetrical castings

- pin rough milling
- material: GJS700

Special countersinking tool

- D = 90 mm
- zz = 5
- ENEX 120612 TL



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