AVANTEC

MILLING TOOLS
CATALOG

*

What do you focus on for existing processes and new projects?
Creating groundbreaking solutions together. Using new innovative tools.
For every industry sector.

*Maximizing **tool life**

*Reducing **the cost per part**

*Optimizing **machining times**

*Making **processes** reliable

AVANTEC

Dear customers,

You know our motto: First comes the solution. Then comes our tool. And then your success.

Machining is about implementing intelligent milling strategies with innovative tools. Using the right focus on the work piece specific requirements, Avantec milling cutters optimize machining times, maximize tool life, make processes reliable and reduce the cost per part.

This machine tool catalog provides you with every important and essential information needed to optimally plan and implement the use of our milling tools at your manufacturing plant and production line.

Make use of our experience and our know-how – we will be glad to discuss your challenges and objectives with you.

Sincerely yours,
Uli Werthwein

CEO | Avantec Zerspantechnik GmbH

CONTENT
AVANTEC TOOLS

LEGEND

AS number of cutting edges | **BR** bottom rings | **DR** double cutting rings
Ic internal coolant | **INS** indexable insert | **K** non machined amount
M metric | **Nw** nominal size | **R** corner radius | **rth** theoretical corner radius
SL length of cut | **SW** wrench size | **TK** pitch circle | **ZR** intermediate rings

NOTE

All cutting data are values recommended based on our experience. The consideration of all conditions is not possible within the scope of this catalog. Therefore, we do not assume any liability for this data. Please contact our headquarters or your regular service consultant direct if you require process and work piece specific information.

BR20

When broaching the keyways for our tool bodies in the past, we kept running into unexpected problems. Then we designed our own specific tool. Now we have a stable, reliable and productive process.

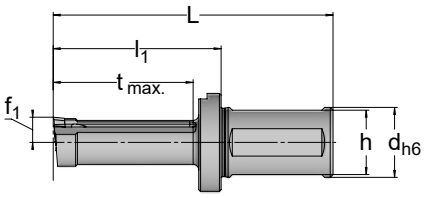
For stable and reliable broaching processes

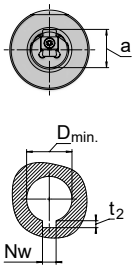
BROACHING TOOLS

BROACHING TOOLS **BR20**

NEWTOOL

- Double-cutting edge indexable insert
- Best cutting and gliding characteristics
- High cutting values even at low machine performance levels
- Highly stable cutting edge support
- Polished precision indexable inserts
- Internal cooling

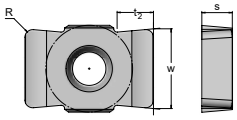




BR20

Article	Nw	t_2	d_{h6}	h	L	l_1	t_{max}	D_{min}	f_1	a	Ic	kg	INS
17BR.1604.001	4C11	2.1	25	23	80	40	30	14	7.0	14.05	yes	0.2	BR.15T3.007.01
17BR.2206.001	6C11	2.6	25	23	100	60	50	18	9.0	16.85	yes	0.28	BR.15T3.007.02
17BR.2707.001	7C11	3.3	25	23	100	60	50	19	9.0	18.15	yes	0.3	BR.15T3.007.03
17BR.3208.001	8C11	3.4	25	23	100	60	50	24	11.25	22.0	yes	0.3	BR.2005.007.01
17BR.4010.001	10C11	4.2	32	30	102	62	52	26.5	13.0	25.21	yes	0.5	BR.2504.007.01
17BR.5012.001	12C11	5.1	32	30	102	62	52	30.5	14.95	29.2	yes	0.6	BR.2504.007.02

INS SHAPE **BR**

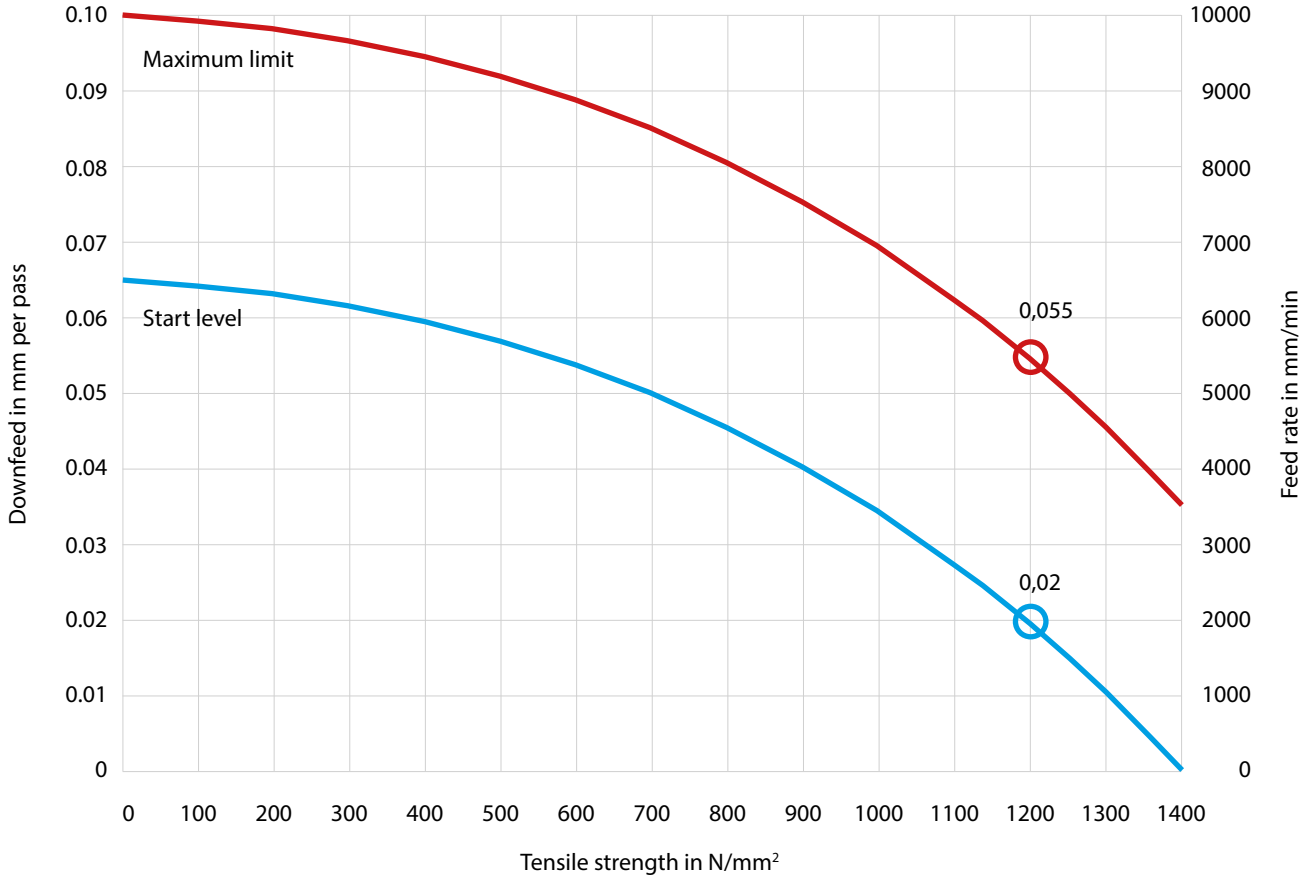


BR

Article	AS	Nw	w	s	t_2	R
BR.15T3.007.01 NERO²77	2	4C11	4.11	3.97	2.1	0.5
BR.15T3.007.02 NERO²77	2	6C11	6.11	3.97	2.6	0.8
BR.15T3.007.03 NERO²77	2	7C11	7.12	3.97	3.3	0.8
BR.2005.007.01 NERO²77	2	8C11	8.12	5.00	3.4	1.0
BR.2504.007.01 NERO²77	2	10C11	10.12	4.76	4.2	1.0
BR.2504.007.02 NERO²77	2	12C11	12.15	4.76	5.1	1.2

Chart showing feed rate and downfeed in relation to the material's tensile strength. The values depend on the usage/machine conditions and may vary. The machine conditions significantly influence the cutting speed.

Example: In case of a material with 1200 N/mm² tensile strength, the downfeed per stroke can be between 0.02-0.055 mm – depending on feed rate and machine performance.



INS		
BR.15T3...	08B.0309.7991	TX208
BR.2005...	08B.3511.7991	TX215
BR.2504...	08B.4511.7991	TX220

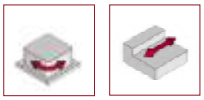
CM90 | EM90 | FM90 | MM90 | CW90

The modularity of the multiring system makes these high-performance tools flexible for a wide range of applications. The extremely smooth cutting, which is also evident in heavy duty machining scenarios, delivers highly precise machining results. This is a critical advantage to ensure high precision paired with maximum Q, especially when working with less powerful machines or unstable/filigree work pieces.

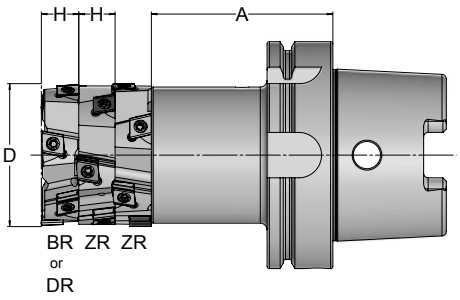
The AVANTEC Original

MULTIRING SHELL END MILLS

MULTIRING **CM90**



- Modular disc design
- Custom cutting lengths up to 2.5 x D
- 4-cutting edge CN07 indexable insert
- Rugged M3 fixation



Tool holders CM90

D	SK50 DIN69871	A	kg	SK40 DIN69871	A	kg	HSK-A63	A	kg	HSK-A100	A	kg
32	–	–	–	09A.4032.001	39	0.91	09E.6332.1050	50	0.82	–	–	–
40	09A.5004.001	49	2.85	09A.4004.001	39	0.95	09E.6304.1060	60	0.94	–	–	–
45/50	09A.5045.001	39	2.82	09A.4045.001	39	1.00	09E.6345.1060	60	1.02	09E.1045.001	85	3.3
45/50	09A.5045.016	90	3.37	09A.4045.007	90	1.54	–	–	–	–	–	–

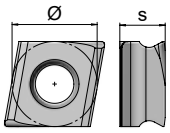
Tool holders CM90 Ø 40 mm not compatible with tool holders EM90 Ø 40 mm. Other dimensions upon request

Intermediate rings ZR | bottom rings BR | double cutting rings DR CM90

D	ZR Article	H	z_{eff}	BR Article	H	z_{eff}	INS Designation	Qty.	DR Article	H	z_{eff}	INS Designation	Qty.	Weight per ring in kg
32	12C.3212.001	11	2	12C.3213.002	13	2	CNHQ07T306.L CNHQ07T300.R	2 2	–	–	–	–	–	< 0.5
40	12C.4012.001	11	3	12C.4013.002	13	3	CNHQ07T306.L CNHQ07T300.R	3 3	12C.4021.001	21	3	CNHQ07T306.L CNHQ07T300.R MOGU100310.R	3 3 3	< 0.5
45	12C.4512.001	12.5	3	12C.4513.002	13.5	3	CNHQ07T306.L CNHQ07T300.R	3 3	–	–	–	–		< 0.5
50	12C.5012.001	12.5	3	12C.5013.002	13.5	3	CNHQ07T306.L CNHQ07T300.R	3 3	–	–	–	–		< 0.5

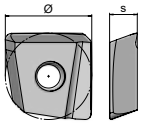
Mounting | ZR/BR/DR page 139
Order information page 140-141

INS SHAPE **CN | MO**



CN

AS	Ø	s
4	07	T3
	7.5	4



MO

AS	Ø	s
2	10	03
	10	3.6

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	CN.07T3.043.01 SKY77	CNHQ 07T300 SR-28V	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–

	Article	Designation	Recomm. a_e 0.2 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	CN.07T3.008.11 NERO²77		h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	CN.07T3.043.01 SKY77	CNHQ 07T300 SR-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	CN.07T3.043.01 NERO²77		h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180

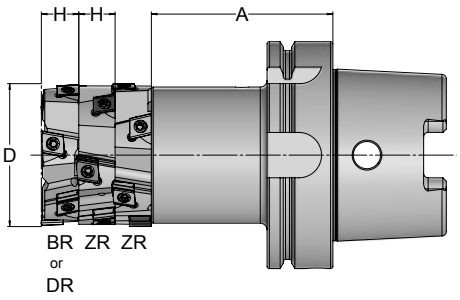
Parameters vibration-/surface-dependent

INS		
CN..07T3...	08B.0375.7991	TX208
MO..1003...	08B.0375.001	TX208

Mounting | CN/EN/FN indexable insert page 138

MULTIRING **EM90**

Modular disc design
Custom cutting lengths up to 2.5 x D
Dual positive/negative helix reduces the axial impact of tractive and compressive forces



Tool holders EM90

D	SK60 DIN69871	A	kg	SK50 DIN69871	A	kg	HSK-A100	A	kg
63	–	–	–	09A.5063.008	49	3.21	09E.1063.1080	80	3.11
63	–	–	–	09A.5063.031	100	4.30	–	–	–
63	–	–	–	09A.5063.021	150	5.36	–	–	–
80	–	–	–	09A.5080.006	49	3.56	09E.1080.1080	80	3.77
80	–	–	–	09A.5080.025	100	5.35	–	–	–
100	–	–	–	09A.5010.002	49	3.75	09E.1010.1100	110	6.20
100	09A.6010.002	75	11.11	09A.5010.023	100	5.45	–	–	–

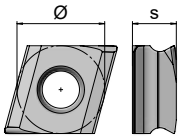
Intermediate rings ZR | bottom rings BR | double cutting rings DR EM90

D	ZR Article	H	z_{eff}	BR Article	H	z_{eff}	INS Article	Qty.	DR Article	H	z_{eff}	INS Article	Qty.	Weight per ring in kg
63	12E.6317.001	16	3	12E.6317.002	16.5	3	ENHQ090400.R ENHQ090408.L	3 3	12E.6322.002	22	3	ENHQ090400.R ENHQ120610.L LNEX200710.R	3 3 3	< 0.5
80	12E.8023.001	22	3	12E.8023.002	23.2	3	ENHQ120600.R ENHQ120610.L	3 3	12E.8025.002	25	3	ENHQ120600.R ENHQ120610.L LNEX200710.R	3 3 3	< 1.0
100	12E.1023.003	22	4	12E.1023.004	23.2	4	ENHQ120600.R ENHQ120610.L	4 4	12E.1026.001	26.7	4	ENHQ120600.R ENHQ120610.L LNEX250625.R	4 4 4	< 1.5

Other dimensions upon request

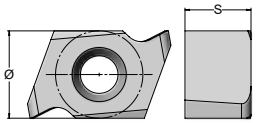
Mounting | ZR/BR/DR page 139
Order information page 140-141

INS SHAPE **EN | LN**



EN

AS	Ø		s	
4	09	12	04	06
	9.52	12.7	4.76	6.35



LN

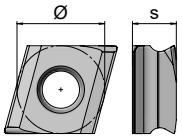
AS	Ø		s	
2	20	25	06	07
	9.52	12.7	6.4	7.2

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..0904..	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.0904.016.25 SKY77	ENHQ 090400 SR-28V	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	–	–	–	–	0.12	0.11	0.10
			v_c	–	–	–	–	140-180	110-140	80-110
	EN.0904.002.55 SKY77	ENHQ 090400 SR-30	h_{max}	–	–	–	–	0.12	0.11	0.10
			v_c	–	–	–	–	140-180	110-140	80-110
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0.23	0.21	0.20	0.18	0.16	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	EN.1206.026.19 SKY77	ENHQ 120600 SR-25V	h_{max}	0.23	0.21	0.20	0.18	0.16	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0.20	0.20	0.18	0.16	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.1206.026.20 SKY77	ENHQ 120600 SR-28V	h_{max}	0.20	0.20	0.18	0.16	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.1206.003.52 SKY77	ENHQ 120610 SL-28	h_{max}	0.20	0.20	0.18	0.16	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.1206.002.53 SKY77	ENHQ 120600 SR-28	h_{max}	0.20	0.20	0.18	0.16	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	EN.1206.003.54 SKY77	ENHQ 120610 SL-30	h_{max}	–	–	–	–	0.12	0.11	0.10
			v_c	–	–	–	–	140-180	110-140	80-110
	EN.1206.002.55 SKY77	ENHQ 120600 SR-30	h_{max}	–	–	–	–	0.12	0.11	0.10
			v_c	–	–	–	–	140-180	110-140	80-110
LN..2007..	LN.2007.009.03 SKY77	LNEX 200710 TR-25	h_{max}	0.23	0.21	0.20	0.18	0.16	0.14	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
LN..2506..	LN.2506.004.05 SKY77	LNEX 250625 TR-25	h_{max}	0.23	0.21	0.20	0.18	0.16	0.14	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–

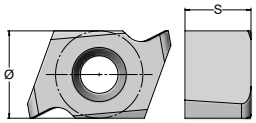
Parameters vibration-/surface-dependent

INS SHAPE **EN | LN**



EN

AS	Ø		s	
4	09	12	04	06
	9.52	12.7	4.76	6.35



LN

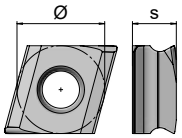
AS	Ø		s	
2	20	25	06	07
	9.52	12.7	6.4	7.2

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
EN..0904..	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.017.26 NERO26	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.0904.016.25 SKY77	ENHQ 090400 SR-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.016.25 NERO26	ENHQ 090400 SR-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.027.18 NERO26	ENHQ 120610 SL-25V	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.026.19 SKY77	ENHQ 120600 SR-25V	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.026.19 NERO26	ENHQ 120600 SR-25V	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.029.13 NERO26	ENHQ 120610 SL-28W	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.026.20 SKY77	ENHQ 120600 SR-28V	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.026.20 NERO26	ENHQ 120600 SR-28V	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.003.52 SKY77	ENHQ 120610 SL-28	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.002.53 SKY77	ENHQ 120600 SR-28	h_{max}	0.23	0.23	0.20	0.18	0.16	0.14
			v_c	200-280	200-260	180-230	170-210	160-190	140-180

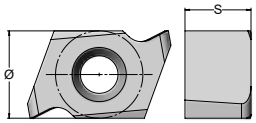
Parameters vibration-/surface-dependent

INS SHAPE **EN | LN**



EN

AS	Ø		s	
4	09	12	04	06
	9.52	12.7	4.76	6.35



LN

AS	Ø		s	
2	20	25	06	07
	9.52	12.7	6.4	7.2

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
LN..2007..	LN.2007.009.03 SKY77	LNEX 200710 TR-25	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
LN..2506..	LN.2506.004.05 SKY77	LNEX 250625 TR-25	h_{max}	0.25	0.25	0.23	0.20	0.18	0.16
			v_c	200-280	200-260	180-230	170-210	160-190	140-180

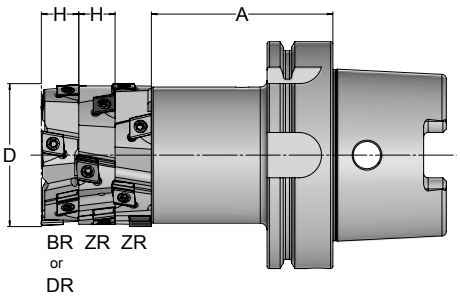
Parameters vibration-/surface-dependent

INS		
EN..0904...	08B.3511.7991	TX215
EN..1206...	08B.0513.7991	TX220
LN..2007...	08B.3511.7991	TX215
LN..2506...	08B.4511.7991	TX220

Mounting | CN/EN/FN indexable insert page 138

MULTIRING **FM90**

- Modular disc design
- Custom cutting lengths up to 2.5 x D
- Multi-tooth design thanks to fine tooth pitch



Tool holders FM90

D	SK50 DIN69871	A	kg	SK40 DIN69871	A	kg	HSK-A63	A	kg	HSK-A100	A	kg
45/50	09A.5045.001	39	2.82	09A.4045.001	39	1	09E.6345.1060	60	1.02	09E.1045.001	85	3.30
45/50	09A.5045.016	90	3.37	09A.4045.007	90	1.54	–	–	–	–	–	–
66	09A.5063.008	49	3.21	–	–	–	09E.6363.1060	60	1.28	09E.1063.1080	80	3.11
66	09A.5063.031	100	4.30	–	–	–	–	–	–	–	–	–
66	09A.5063.021	150	5.36	–	–	–	–	–	–	–	–	–
92	09A.5092.001	49	3.68	–	–	–	–	–	–	09E.1092.001	80	4.27

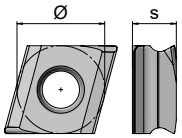
Intermediate rings ZR | bottom rings BR | double cutting rings DR FM90

D	ZR Article	H	z_{eff}	BR Article	H	z_{eff}	INS Article	Qty.	DR Article	H	z_{eff}	INS Article	Qty.	Weight per ring in kg
45	12F.4513.021	13	3	12F.4513.022	13.5	3	FNHQ08T300.R FNHQ08T306.L	3 3	–	–	–	–	–	< 0.5
50	12F.5015.021	14.2	3	12F.5015.022	15.5	3	FNHQ08T300.R FNHQ08T306.L	3 3	12F.5015.024	15	3	MOGU100308.R FNHQ08T300.R	3 3	< 0.5
66	12F.6619.031	19.5	3	12F.6620.032	20	3	FNHQ110608.R FNHQ110608.L	3 3	–	–	–	–	–	< 0.5
92	12F.9218.003	18.5	4	12F.9220.004	20	4	FNHQ110608.R FNHQ110608.L	4 4	12F.9225.001	25	4	FNHQ110608.R FNHQ110608.L LNHX250825.R	4 4 4	< 1.0

Other dimensions upon request

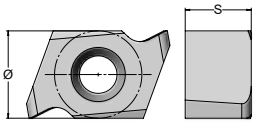
Mounting | ZR/BR/DR page 139
Order information page 140-141

INS SHAPE **FN | LN | MO**



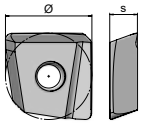
FN

AS	Ø		s	
4	08	11	T3	06
	8	11	3.97	6.35



LN

AS	Ø	s
2	25	08
	12.7	8



MO

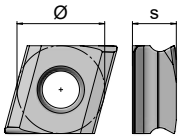
AS	Ø	s
2	10	03
	10	3.6

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
FN..08T3..	FN.08T3.004.09 SKY77	FNHQ 08T306 SL-28V	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	FN.08T3.005.10 SKY77	FNHQ 08T300 SR-28V	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
FN..1106..	FN.1106.018.01 SKY77	FNHQ 110608 TL-25V	h_{max}	0.18	0.18	0.18	0.16	0.15	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	FN.1106.018.02 SKY77	FNHQ 110608 TL-28V	h_{max}	0.16	0.16	0.16	0.14	0.13	0.10	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	FN.1106.019.01 SKY77	FNHQ 110608 TR-25V	h_{max}	0.18	0.18	0.18	0.16	0.15	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	FN.1106.019.02 SKY77	FNHQ 110608 TR-28V	h_{max}	0.16	0.16	0.16	0.14	0.13	0.10	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
LN..2508..	LN.2508.002.01 SKY77	LNHX 250825 TR-25	h_{max}	0.18	0.18	0.18	0.16	0.15	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.17	0.17	0.17	0.15	0.14	0.12	–
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–

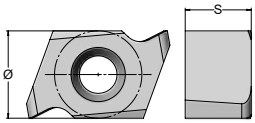
Parameters vibration-/surface-dependent

INS SHAPE **FN | LN | MO**



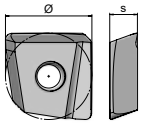
FN

AS	Ø		s	
4	08	11	T3	06
	8	11	3.97	6.35



LN

AS	Ø	s
2	25	08
	12.7	8



MO

AS	Ø	s
2	10	03
	10	3.6

Matching of machining parameters with the AV material groups

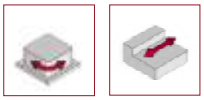
	Article	Designation	Recomm. a_e 0.2 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
FN..08T3..	FN.08T3.004.09 SKY77	FNHQ 08T306 SL-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	FN.08T3.004.09 NERO26	FNHQ 08T306 SL-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	FN.08T3.005.10 SKY77	FNHQ 08T300 SR-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	FN.08T3.005.10 NERO26	FNHQ 08T300 SR-28V	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
FN..1106..	FN.1106.018.01 SKY77	FNHQ 110608 TL-25V	h_{max}	0.19	0.19	0.17	0.15	0.12	0.11
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	FN.1106.018.02 SKY77	FNHQ 110608 TL-28V	h_{max}	0.17	0.17	0.15	0.13	0.10	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	FN.1106.019.01 SKY77	FNHQ 110608 TR-25V	h_{max}	0.19	0.19	0.17	0.15	0.12	0.11
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	FN.1106.019.02 SKY77	FNHQ 110608 TR-28V	h_{max}	0.17	0.17	0.15	0.13	0.10	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
LN..2508..	LN.2508.002.01 SKY77	LNHX 250825 TR-25	h_{max}	0.19	0.19	0.17	0.15	0.12	0.11
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.18	0.18	0.16	0.14	0.11	0.10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180

Parameters vibration-/surface-dependent

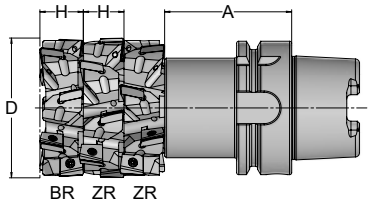
INS		
FN..08T3...	08B.0309.7991	TX208
FN..1106...	08B.3511.7991	TX215
LN..2508...	08B.0513.7991	TX220
MO..1003...	08B.0375.001	TX208

Mounting | CN/EN/FN indexable insert page 138

MULTIRING **MM90**



Especially suitable for materials
which are difficult to machine
Extremely smooth running
Optimum precision paired with maximum Q



Tool holders
MM90

D	SK50 DIN69871	A	kg	HSK-A63	A	kg	HSK-A100	A	kg
66	09A.5050.015	49	3.00	–	–	–	–	–	–
66	–	–	–	09E.6350.1060	60	1.10	–	–	–
80	09A.5063.008	49	3.21	09E.6363.1060	60	1.28	09E.1063.1080	80	3.11
80	09A.5063.031	100	4.30	–	–	–	–	–	–
80	09A.5063.021	150	5.36	–	–	–	–	–	–
100	09A.5080.006	49	3.56	–	–	–	09E.1080.1080	80	3.77
100	09A.5080.025	100	5.35	–	–	–	–	–	–

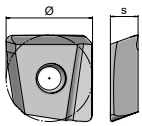
Intermediate rings ZR | bottom rings BR
MM90

D	ZR Article	H	z_{eff}	BR Article	H	z_{eff}	INS Article	Qty.	Weight per ring in kg
66	12M.6619.081	19.2	4	12M.6620.082	20.5	4	MOGU12T310.L MOGU12T310.R	3 3	< 0.5
80	12M.8019.081	19.2	4	12M.8020.082	20.5	4	MOGU12T310.L MOGU12T310.R	3 3	< 1.0
100	12M.1019.081	19.2	4	12M.1020.082	20.5	4	MOGU12T310.L MOGU12T310.R	3 3	< 1.0

Other dimensions upon request

Mounting | ZR/BR/DR page 139
Order information page 140-141

INS SHAPE **MO**



MO

AS	Ø	s
2	12	T3
	12.7	4

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.2 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
MO..12T3..	MO.12T3.082.01 SKY77	MOGU 12T310 TL-28	h_{max}	0.18	0.18	0.18	0.16	0.14	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	MO.12T3.082.01 AV1077	MOGU 12T310 TL-28	h_{max}	–	–	0.18	0.16	0.14	0.12	0.10
			v_c	–	–	180-210	160-200	140-180	110-140	80-110
	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	0.18	0.18	0.18	0.16	0.14	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	–
	MO.12T3.081.01 AV1077	MOGU 12T310 TR-28	h_{max}	–	–	0.18	0.16	0.14	0.12	0.10
			v_c	–	–	180-210	160-200	140-180	110-140	80-110

	Article	Designation	Recomm. a_e 0.2 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
MO..12T3..	MO.12T3.082.01 SKY77	MOGU 12T310 TL-28	h_{max}	0.22	0.22	0.20	0.18	0.16	0.13
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	0.22	0.22	0.20	0.18	0.16	0.13
			v_c	200-280	200-260	180-230	170-210	160-190	140-180

	Article	Designation	Recomm. a_e 0.2 x D	Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
MO..12T3..	MO.12T3.082.01 SKY77	MOGU 12T310 TL-28	h_{max}	–	–	–	–	0.25	0.23	0.20
			v_c	–	–	–	–	280-450	250-350	250-350
	MO.12T3.082.01 AV1077	MOGU 12T310 TL-28	h_{max}	0.12	0.10	0.08	–	0.25	0.23	0.20
			v_c	120-170	100-150	80-140	–	280-450	250-350	250-350
	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	–	–	–	–	0.25	0.23	0.20
			v_c	–	–	–	–	280-450	250-350	250-350
	MO.12T3.081.01 AV1077	MOGU 12T310 TR-28	h_{max}	0.12	0.10	0.08	–	0.25	0.23	0.20
			v_c	120-170	100-150	80-140	–	280-450	250-350	250-350

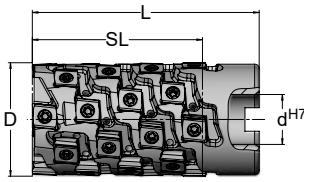
Parameters vibration-/surface-dependent

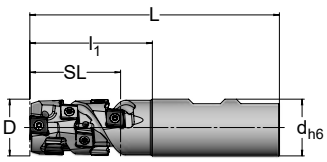
INS		
MO..12T3...	08B.0309.001	TX208

SHELL END MILLS **CW90**

NEWTOOL

Fine tooth pitch thanks to tangential insert design
Soft cutting tool
Extremely smooth running thanks to the division of the cut





CW90
Shank end mills

Article	D	d_{h6}	L	l_1	SL	zz	z_{eff}	lc	kg	INS
02C.2511.001	25	25	110	54	40.0	12	2	yes	0.37	CN..07T3.L
02C.3212.001	32	25	126	70	54.0	24	3	yes	0.54	CN..07T3.L
02C.4014.001	40	32	140	73	60.0	27	3	yes	1.02	CN..07T3.L

CW90
Plug-in milling cutters

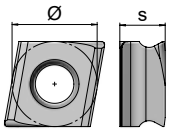
Article	D	d^{H7}	L	SL	zz	z_{eff}	lc	kg	INS
02C.5010.001	50	22	100	75	32	4	yes	1.45	CN..1005.L
02C.6313.001	63	32	130	94.5	40	4	yes	2.49	CN..1005.L
02C.8011.001	80	32	110	85	45	5	yes	3.54	CN..1005.L

Use the multiring systems for length ratios of more than 1.5 x D

INS		
CN..07T3...	08B.0309.7991	TX208
CN..1005...	08B.3511.7991	TX215

Mounting | CN/EN/FN indexable insert page 138

INS SHAPE **CN**



CN

AS	Ø		s	
4	07	10	T3	05
	7.5	10.4	4	5.6

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.15	0.15	0.15	0.13	0.12	0.12	0.10
			v_c	220-280	200-260	180-240	180-210	140-180	110-140	80-110
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	–	–	–	–	–	0.12	0.10
			v_c	–	–	–	–	–	110-140	80-110
CN..1005..	CN.1005.002.01 SKY77	CNHQ 100510 SL-25V	h_{max}	0.25	0.23	0.20	0.20	0.14	0.14	0.12
			v_c	220-280	200-260	180-240	180-210	140-180	110-140	80-110
	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	0.22	0.20	0.18	0.18	0.12	0.12	0.10
			v_c	220-280	200-260	180-240	180-210	140-180	110-140	80-110
	CN.1005.002.02 AV1077	CNHQ 100510 SL-28V	h_{max}	–	–	–	0.20	0.14	0.14	0.12
			v_c	–	–	–	190-230	160-200	130-160	80-130

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.16	0.16	0.15	0.12	0.12	0.11
			v_c	220-280	200-240	170-200	150-190	120-160	120-150
	CN.07T3.008.11 NERO²77	CNHQ 07T306 SL-28W	h_{max}	0.16	0.16	0.13	0.13	0.12	0.10
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
CN..1005..	CN.1005.002.01 SKY77	CNHQ 100510 SL-25V	h_{max}	0.25	0.25	0.20	0.15	0.14	0.11
			v_c	220-280	200-240	170-200	150-190	120-160	120-150
	CN.1005.002.01 CAN²77	CNHQ 100510 SL-25V	h_{max}	0.25	0.25	0.20	0.15	0.14	0.11
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	0.25	0.25	0.20	0.16	0.16	0.13
			v_c	220-280	200-240	170-200	150-190	120-160	120-150

	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	–	–	0.22	0.18	0.15
			v_c	120-200	100-170	–	–	650-1000	450-650	280-450
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	0.08	0.08	–	–	–
			v_c	120-220	100-170	90-120	60-100	–	–	–
CN..1005..	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	–	–	–	–	0.28	0.22	0.18
			v_c	–	–	–	–	650-1000	450-650	280-450
	CN.1005.002.02 AV1077	CNHQ 100510 SL-28V	h_{max}	0.18	0.15	–	–	–	–	–
			v_c	120-200	140-170	–	–	–	–	–

Parameters vibration-/surface-dependent

HD60	KC1.1	OE45	SE45 SX45	SE60	SN75 SN87	EK90 SK90

Maintain complete stability while running massive depths of cuts. Attain maximum Q paired with low power consumption. Achieve high steel and cast iron machining efficiency levels by combining the roughing and finishing processes using just one face milling cutter. Large variety program for standard tooling and turn key solutions. Perfectly µ-precise surfaces.

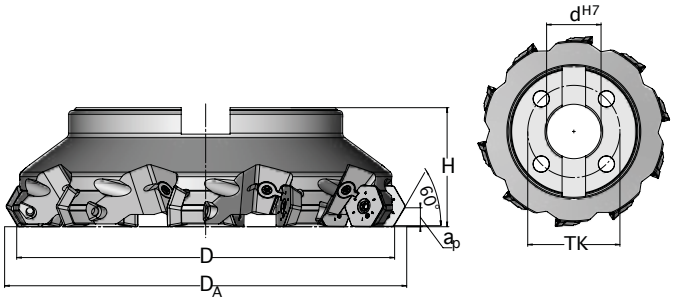
Massive roughing and
ultrafine surface finishing

FACE MILLING CUTTERS
FINISHING CUTTERS

FACE MILLING CUTTERS
HD60


NEWTOOL

For universal use in cast iron and steel machining
Excellent surface quality due to wiper geometry
Variable clamping wedge system suitable for long- and short-chipping materials.



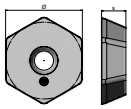
HD60
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Wedge	TK	Ic	kg	INS
03H.1263.100	125	137.8	40	63	7	10	yes	-	no	3.23	HD..2207.N
03H.1663.100	160	172.8	40	63	9	10	yes	66.7	no	5.26	HD..2207.N
03H.2063.100	200	212.8	60	63	10	10	yes	101.6	no	8.57	HD..2207.N

Wedge set			
08Z.0000.358	08K.1008.010	08Z.0000.093	TX225

Mounting instruction
HD60 page 135

INS SHAPE **HD**



HD

AS	Ø	s
6	22	07
	22	7

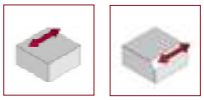
Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0,7 x D		Steel						
					A22	A21	A20	A19	A18	A17	A16
HD..2207..	HD.2207.002.01 SKY77	HDHW 2207M0 SN-23	h_{max}		0.65	0.60	0.55	0.50	0.45	–	–
			v_c		280-320	240-280	210-240	180-210	140-180	–	–
	HD.2207.004.01 SKY77	HDHT 2207M0 SN-28	h_{max}		–	–	0.50	0.45	0.40	0.35	0.30
			v_c		–	–	210-240	180-210	140-180	110-140	80-110

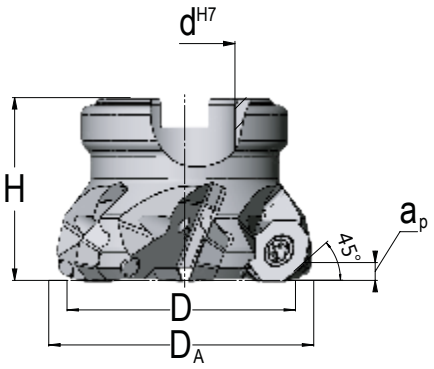
	Article	Designation	Recomm. a_e 0,7 x D		Cast iron					
					D21	D20	D19	D18	D17	D16
HD..2207..	HD.2207.002.01 SKY77	HDHW 2207M0 SN-23	h_{max}		0.65	0.60	0.55	0.50	0.45	–
			v_c		280-320	260-290	240-280	210-240	180-210	–
	HD.2207.002.01 NERO²77	HDHW 2207M0 SN-23	h_{max}		0.65	0.60	0.55	0.50	0.45	–
			v_c		300-340	280-320	240-280	210-240	180-210	–
	HD.2207.002.01 CAN²77	HDHW 2207M0 SN-23	h_{max}		0.65	0.60	0.55	0.50	0.45	–
			v_c		320-380	300-340	260-300	210-240	180-210	–
	HD.2207.004.01 SKY77	HDHT 2207M0 SN-28	h_{max}		–	–	–	0.45	0.40	0.35
			v_c		–	–	–	210-240	180-210	140-180

INS		
HD..2207...	08B.0514.7991	TX220

FACE MILLING CUTTERS
KC1.1



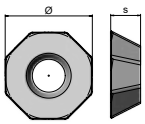
For universal use in cast iron and steel machining
Excellent surface quality due to wiper geometry
Optimal chip removal through improved cutting edge geometry



KC1.1
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Wedge	Ic	kg	INS
03O.5040.001	50	58.8	22	40	6	3.5	no	yes	0.35	OF..1505.N
03O.6340.001	63	71.9	22	40	7	3.5	no	yes	0.56	OF..1505.N

INS SHAPE **OF**



OF

AS	Ø	s
8	15	05
	14.7	5

Matching of machining parameters
with the AV material groups

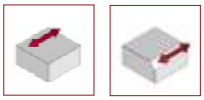
	Article	Designation	Recomm. a_e 0,7 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
OF..1505..	OF.1505.001.31 SKY77	OFEW 1505M0 TN-28S	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30	0.30
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	OF.1505.001.40 SKY77	OFEW 1505M0 TN-25	h_{max}	0.60	0.55	0.50	0.45	0.40	–	–
			v_c	280-320	240-280	210-240	180-210	140-180	–	–

	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
OF..1505..	OF.1505.001.32 CAN²26	OFEW 1505M0 TN-25S	h_{max}	0.60	0.55	0.50	0.45	0.40	0.35
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	OF.1505.001.30 NERO²77	OFEW 1505M0 SN-28S	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30
			v_c	300-340	270-300	240-280	210-240	180-210	140-180
	OF.1505.001.31 SKY77	OFEW 1505M0 TN-28S	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30
			v_c	280-320	260-300	240-280	210-240	180-210	140-180
	OF.1505.001.40 SKY77	OFEW 1505M0 TN-25	h_{max}	0.60	0.55	0.50	0.45	0.40	0.35
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

	Article	Designation	Recomm. a_e 0,7 x D	NF metals		
				D21	D20	D19
OF..1505..	OF.1505.001.31 SKY77	OFEW 1505M0 TN-28S	h_{max}	0.55	0.50	0.35
			v_c	650-1000	450-650	280-450

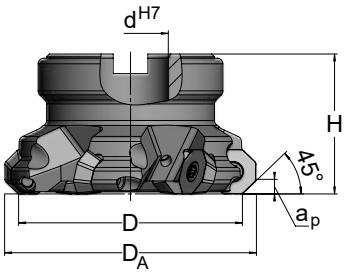
INS		
OF..1505...	08B.4511.7991	TX220

FACE MILLING CUTTERS
OE45



NEWTOOL

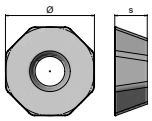
Well suited for the powerful machining of stainless steel materials
Optimal chip removal through improved cutting edge geometry
All diameters with internal cooling



OE45
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
03O.6340.400	63	73.2	22	40	5	4.5	yes	0.55	OE.1606..
03O.8050.400	80	90.0	27	50	6	4.5	yes	1.08	OE.1606..
03O.1050.400	100	110.1	32	50	8	4.5	yes	1.78	OE.1606..
03O.1263.400	125	135.1	40	63	10	4.5	yes	3.41	OE.1606..
03O.1663.400	160	170.0	40	63	12	4.5	yes	5.02	OE.1606..

INS SHAPE **OE**



OE

AS	Ø	s
8	16	06
	16.5	6

Matching of machining parameters with the AV material groups

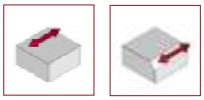
	Article	Designation	Recomm. a_e 0,7 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
OE.1606..	OE.1606.031.03 AV1077	OEEW 1606MO SN-28	h_{max}	0.55	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	OE.1606.031.03 AV1055	OEEW 1606MO SN-28	h_{max}	–	–	–	0.40	0.40	0.35	0.25
			v_c	–	–	–	180-210	140-180	110-140	80-110
	OE.1606.002.02 SKY77	OEEW 1606MO SN-25	h_{max}	0.60	0.55	0.50	0.45	0.45	–	–
			v_c	250-280	210-250	190-220	180-210	140-180	–	–
	OE.1606.002.02 AV1077	OEEW 1606MO SN-25	h_{max}	0.60	0.55	0.50	0.45	0.45	–	–
			v_c	280-320	240-280	210-240	180-210	140-180	–	–
	OE.1606.031.01 SKY77	OEEW 1606MO SN-23	h_{max}	0.60	0.55	0.55	–	–	–	–
			v_c	250-280	210-250	190-220	–	–	–	–
	OE.1606.031.01 AV1077	OEEW 1606MO SN-23	h_{max}	0.60	0.55	0.55	–	–	–	–
			v_c	280-320	240-280	210-240	–	–	–	–

	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
OE.1606..	OE.1606.002.02 SKY77	OEEW 1606MO SN-25	h_{max}	0.65	0.55	0.45	0.40	0.35	0.30
			v_c	260-300	240-270	200-260	190-220	170-210	140-180
	OE.1606.031.01 SKY77	OEEW 1606MO SN-23	h_{max}	0.65	0.55	0.45	0.40	0.35	0.30
			v_c	260-300	240-270	200-260	190-220	170-210	140-180

	Article	Designation	Recomm. a_e 0,7 x D	Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
OE.1606..	OE.1606.031.03 AV1077	OEEW 1606MO SN-28	f_z	0.35	0.30	0.25	0.22	0.60	0.45	0.35
			v_c	100-150	100-150	80-120	60-100	650-1000	450-650	280-450
	OE.1606.031.03 AV1055	OEEW 1606MO SN-28	f_z	0.35	0.30	0.25	0.22	–	–	–
			v_c	100-200	100-200	80-150	60-120	–	–	–

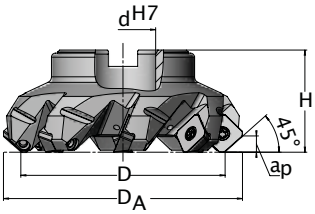
INS		
OE.1606...	08B.0513.7991	TX220

FACE MILLING CUTTERS
SE45 | SX45

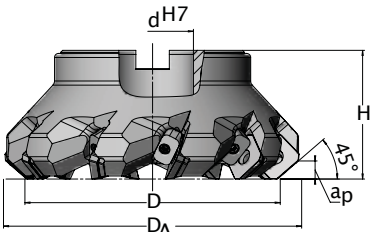


Roughing and finishing with the
same indexable insert
SE45 is optimal for long-chipping materials
SX45 for jobs requiring an increased
number of teeth

SE45



SX45



SE45
Plug-in milling cutters

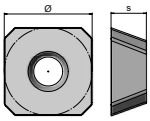
Article	D	D_A	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
03S.8050.005	80	96.9	27	50	6	8.4	yes	1.19	SE..1506.N
03S.1050.005	100	117.0	32	50	8	8.4	yes	1.70	SE..1506.N
03S.1263.008	125	142.0	40	63	8	8.4	yes	2.98	SE..1506.N
03S.1663.007	160	177.2	40	63	12	8.4	no	4.93	SE..1506.N
03S.2063.008	200	217.4	60	63	14	8.4	no	6.94	SE..1506.N

SX45
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Wedge	lc	kg	INS
03S.1263.031	125	145.2	40	63	10	8.8	yes	yes	3.87	SX..1906.N
03S.1663.032	160	180.4	40	63	12	8.8	yes	yes	5.99	SX..1906.N
03S.1663.031	160	180.2	40	63	16	8.8	yes	no	6.15	SX..1906.N

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

INS SHAPE **SE | SX**



SE | SX

AS	Ø		s
4	15	19	06
	15.88	19	6.35

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0,7 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
SE..1506…	SE.1506.002.21 SKY77	SEHW 1506AF SN-25	h_{max}	0.60	0.60	0.55	0.50	0.45	0.40	0.35
			v_c	270-300	240-280	210-240	180-210	140-180	110-140	80-110
	SE.1506.002.22 SKY77	SEHW 1506AF SN-28	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30	0.30
			v_c	270-300	240-280	210-240	180-210	140-180	110-140	80-110
SX..1906…	SX.1906.002.21 SKY77	SXMW 1906AF SN-25	h_{max}	0.60	0.55	0.50	0.45	0.45	–	–
			v_c	270-300	240-280	210-240	180-210	140-180	–	–
	SX.1906.002.22 SKY77	SXMW 1906AF SN-28	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30	0.30
			v_c	270-300	240-280	210-240	180-210	140-180	110-140	80-110

	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
SE..1506…	SE.1506.002.21 SKY77	SEHW 1506AF SN-25	h_{max}	0.65	0.65	0.60	0.50	0.40	0.35
			v_c	280-320	260-290	240-280	210-240	180-210	140-180
	SE.1506.002.22 SKY77	SEHW 1506AF SN-28	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30
			v_c	280-320	260-290	240-280	210-240	180-210	140-180
SX..1906…	SX.1906.002.21 SKY77	SXMW 1906AF SN-25	h_{max}	0.65	0.55	0.45	0.40	0.35	0.30
			v_c	280-320	260-290	240-280	210-240	180-210	140-180
	SX.1906.002.21 CAN²26	SXMW 1906AF SN-25	h_{max}	0.65	0.55	0.45	0.40	0.35	0.30
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SX.1906.002.22 SKY77	SXMW 1906AF SN-28	h_{max}	0.55	0.50	0.45	0.40	0.35	0.30
			v_c	280-320	260-290	240-280	210-240	180-210	140-180

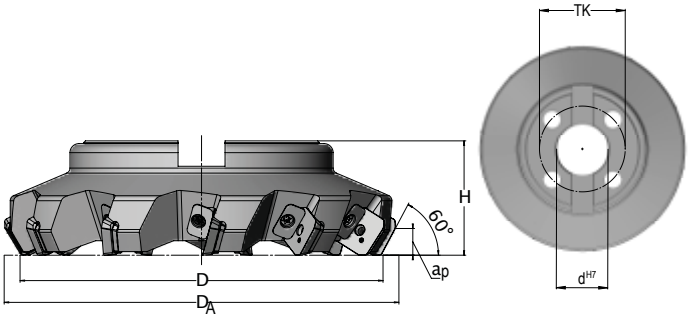
	Article	Designation	Recomm. a_e 0,7 x D	NF metals		
				E82	E81	E80
SE..1506…	SE.1506.002.22 SKY77	SEHW 1506AF SN-28	h_{max}	0.55	0.50	0.35
			v_c	650-1000	450-650	280-450
SX..1906…	SX.1906.002.22 SKY77	SXMW 1906AF SN-28	h_{max}	0.55	0.50	0.35
			v_c	650-1000	450-650	280-450

INS		
SE..1506...	08B.4511.7991	TX220

Mounting | Wedge-mounted indexable insert page 136

FACE MILLING CUTTERS
SE60


Up to 14 mm depth of cut for maximum Q
Minimal power consumption,
maximum machining performance

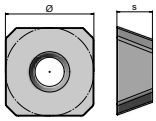


SE60
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	TK	z_{eff}	a_p	Wedge	Ic	kg	INS
03S.1263.130	125	142.5	40	63	–	6	14	yes	no	4.20	SE..2408.R
03S.1663.130	160	177.5	40	63	66.7	8	14	yes	no	5.40	SE..2408.R
03S.2063.130	200	217.5	60	63	101.6	11	14	yes	no	8.81	SE..2408.R

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

INS SHAPE **SE**



SE

AS	Ø	s
4	24	08
	24	8

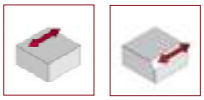
Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0,7 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
SE..2408..	SE.2408.002.05 SKY77	SEHN 240820 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–	–
			v_c	280-320	240-280	210-240	180-210	140-180	–	–
	SE.2408.002.06 SKY77	SEHN 240850 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–	–
			v_c	280-320	240-280	210-240	180-210	140-180	–	–
	SE.2408.003.01 SKY77	SEHR 240850 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–	–
			v_c	280-320	240-280	210-240	180-210	140-180	–	–

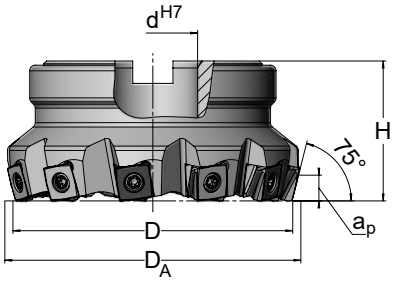
	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
SE..2408..	SE.2408.002.05 SKY77	SEHN 240820 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–
			v_c	280-320	260-290	240-280	210-240	180-210	–
	SE.2408.002.05 NERO²77	SEHN 240820 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–
			v_c	300-340	280-320	240-280	210-240	180-210	–
	SE.2408.002.06 CAN²77	SEHN 240850 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–
			v_c	320-380	300-340	260-300	210-240	180-210	–
	SE.2408.003.01 CAN²77	SEHR 240850 SR-23	h_{max}	0.65	0.60	0.55	0.50	0.45	–
			v_c	320-380	300-340	260-300	210-240	180-210	–

Mounting | Wedge-mounted indexable insert page 136

FACE MILLING CUTTERS
SN75



Kappa 75° – combined with the robust cutting edges permit both, high tooth feed rate and excellent surface quality
8-cutting edge, tangential SN indexable insert
Maximum metal removal rate combined with high process reliability

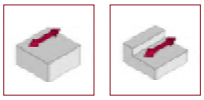


SN75
Plug-in milling cutters

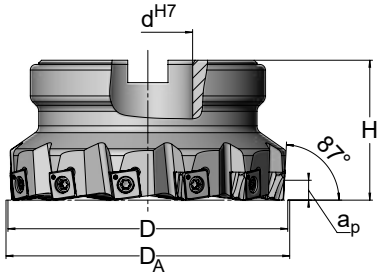
Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Ic	kg	INS
03S.0850.090	80	85.8	27	50	9	5.5	no	1.20	SN..1208.L
03S.1050.090	100	105.8	32	50	11	5.5	no	2.03	SN..1208.L
03S.1263.090	125	130.8	40	63	14	5.5	no	3.05	SN..1208.L
03S.1663.090	160	165.8	60	63	17	5.5	no	4.68	SN..1208.L
03S.2063.090	200	205.8	60	63	20	5.5	no	8.73	SN..1208.L

FACE MILLING CUTTERS

SN87



- Kappa 87° – can also be used as shoulder milling cutters
- Multi-tooth design with fine tooth pitch
- optimal for thin-walled parts
- 8-cutting edge, tangential SN
- indexable insert – robust and soft cutting



SN87
Plug-in milling cutters

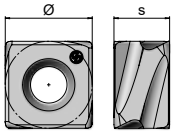
Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Ic	kg	INS
03S.0540.100	50	51.4	22	40	7	5.0	no	0.39	SN..1006.L
03S.0640.100	63	64.4	22	40	8	5.0	no	0.58	SN..1006.L
03S.0850.100	80	81.4	27	50	10	5.0	no	1.13	SN..1006.L
03S.0850.111	80	81.6	27	50	8	7.0	no	1.12	SN..1208.L
03S.1050.100	100	101.4	32	50	12	5.0	no	1.80	SN..1006.L
03S.1050.111	100	101.6	32	50	10	7.0	no	1.82	SN..1208.L
03S.1263.100	125	126.4	40	63	14	5.0	no	2.93	SN..1006.L
03S.1263.111	125	126.6	40	63	12	7.0	no	2.97	SN..1208.L
03S.1663.100	160	161.4	40	63	20	5.0	no	4.72	SN..1006.L
03S.1663.111	160	161.6	40	63	16	7.0	no	4.71	SN..1208.L

SN87+
Plug-in milling cutters

Article	D	D_A	d^{H7}	H	z_{eff}	a_p	Ic	kg	INS
03S.4040.101	40	41.4	16	40	5	5.0	yes	0.25	SN..1006.L*
03S.0640.101	63	64.4	22	40	10	5.0	no	0.58	SN..1006.L
03S.0850.101	80	81.4	27	50	15	5.0	no	1.16	SN..1006.L
03S.0850.190	80	81.6	27	50	9	7.0	no	1.15	SN..1208.L
03S.1050.101	100	101.4	32	50	18	5.0	no	1.88	SN..1006.L
03S.1263.101	125	126.4	40	63	23	5.0	no	3.02	SN..1006.L

* Note that the screw length required varies depending on the insert used

INS SHAPE **SN**



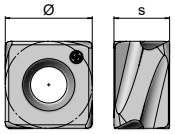
SN

AS	Ø		s	
8	10	12	06	08
	10	12.5	6	8

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
SN..1006…	SN.1006.003.01 SKY77	SNHX 100608 TL-25S	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1006.003.04 NERO26	SNHX 100608 SL-28	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	300-340	280-320	240-280	210-240	180-210	140-180
	SN.1006.003.04 CAN²26	SNHX 100608 SL-28	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1006.018.01 SKY77	SNKY 100608 TL-23	h_{max}	0.30	0.28	0.26	0.22	0.18	–
			v_c	280-320	260-300	230-290	210-240	180-210	–
	SN.1006.018.01 CAN²26	SNKY 100608 TL-23	h_{max}	0.30	0.28	0.26	0.22	0.18	–
			v_c	340-380	280-340	240-280	210-240	180-210	–
	SN.1006.018.02 CAN²26	SNKY 100608 TL-28	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1006.020.01 SKY26	SNKY 100608 SL-20	h_{max}	0.23	0.23	0.21	0.19	0.17	0.14
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
SN..1208… (SN75)	SN.1208.003.05 NERO26	SNHX 120808 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.003.05 CAN²26	SNHX 120808 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.020.02 SKY77	SNHY 120808 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1208.020.02 CAN²77	SNHY 120808 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

INS SHAPE **SN**



SN

AS	Ø		s	
8	10	12	06	08
	10	12.5	6	8

Matching of machining parameters with the AV material groups

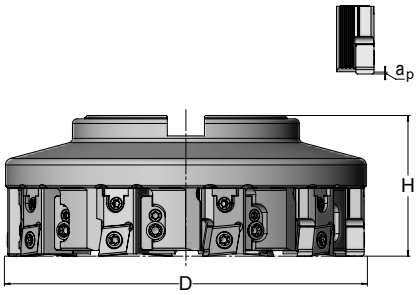
	Article	Designation	Recomm. a_e 0,7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
SN..1208… (SN87)	SN.1208.007.01 SKY77	SNHX 120812 TL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1208.007.01 NERO26	SNHX 120812 TL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.007.01 CAN²26	SNHX 120812 TL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.018.01 SKY77	SNKY 120810 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1208.018.01 CAN²77	SNKY 120810 SL-25S	h_{max}	0.28	0.26	0.24	0.20	0.16	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.018.02 SKY77	SNKY 120810 SL-25S	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1208.018.02 CAN²77	SNKY 120810 SL-25S	h_{max}	0.25	0.25	0.23	0.20	0.18	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	SN.1208.022.01 SKY77	SNKY 120810 SL-20S	h_{max}	0.23	0.23	0.21	0.19	0.17	0.14
			v_c	280-320	260-300	230-290	210-240	180-210	140-180
	SN.1208.022.01 CAN²77	SNKY 120810 SL-20S	h_{max}	0.23	0.23	0.21	0.19	0.17	0.14
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

INS		
SN..1006...*	08B.3511.7991	TX215
SN..1006...	08B.3514.7991	TX215
SN..1208...	08B.0416.7991	TX215

* Note that the screw length required varies depending on the insert used

FINISHING CUTTERS
EK90

- Highly precise finishing cutters with cartridge system
- Simple handling in setting and insert replacement
- Extremely high feed rates with 2-cutting edge ENFQ indexable insert
- Two indexable insert sizes for low axial impact of compressive forces when machining steel



EK90 Plug-in milling cutters

Article	D	d^{H7}	TK	H	z_{eff}	a_p	lc	kg	Cartridge
04E.0650.140	63	22	–	50	5	0.1–0.3	yes	0.87	K-EN08
04E.0850.140	80	27	–	50	6	0.1–0.3	yes	1.45	K-EN08
04E.1060.001	100	32	–	62	6	0.1–0.3	no	2.50	K-EN12
04E.1060.005	100	32	–	62	6	0.1–0.3	no	2.46	K-EN08-g
04E.1260.001	125	40	–	62	8	0.1–0.3	no	3.90	K-EN12
04E.1260.005	125	40	–	62	8	0.1–0.3	no	3.84	K-EN08-g
04E.1660.001	160	40	66.7	62	10	0.1–0.3	no	5.73	K-EN12
04E.1660.005	160	40	66.7	62	10	0.1–0.3	no	5.67	K-EN08-g

EK90 Cartridge

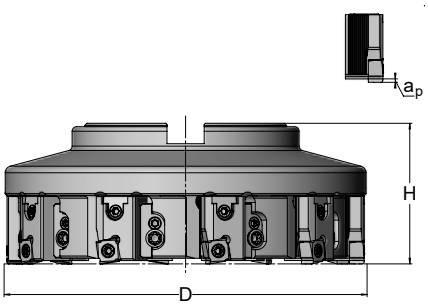
Cartridge no.	Complete set*
K-EN08	08Z.0000.303
K-EN08-g	08Z.0000.301
K-EN12	08Z.0000.302

* The complete set consists of cartridge and all assembly and mounting components

Mounting and adjustment cartridge EK90 | SK 90 page 134

FINISHING CUTTERS
SK90

- Highly precise finishing cutters with cartridge system
- Simple handling in setting and insert replacement
- Excellent surface quality with 4-cutting edge
- SN indexable insert
- Very wide wiper edge for optimum use in cast materials



SK90 Plug-in milling cutters

Article	D	d^{H7}	TK	H	z_{eff}	a_p	Ic	kg	Cartridge
04E.1060.010	100	32	–	62	6	0.1–0.3	no	2.47	K-SN10
04E.1260.010	125	40	–	62	8	0.1–0.3	no	3.86	K-SN10
04E.1660.010	160	40	66.7	62	10	0.1–0.3	no	5.70	K-SN10

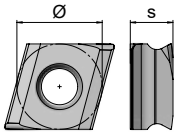
SK90 Cartridge

Cartridge no.	Complete set*
K-SN10	08Z.0000.304

* The complete set consists of cartridge and all assembly and mounting components

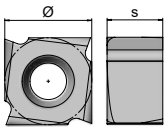
Mounting and adjustment cartridge EK90 | SK 90 page 134

INS SHAPE **EN | SN**



EN

AS	Ø		s	
2	08	12	T3	08
	8	12.7	4	8



SN

AS	Ø	s
4	10	06
	10	6

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..08T3..	EN.08T3.063.04 SKY77	ENFQ 08T310 EL-33S	h_{max}	max 3.0						
			v_c	30-400*						
	EN.08T3.063.04 NERO26	ENFQ 08T310 EL-33S	h_{max}	max 3.0						
			v_c	30-400*						
EN..1208..	EN.1208.041.04 SKY77	ENFQ 120808 EL-33S	h_{max}	max 5.0						
			v_c	30-400*						
	EN.1208.041.04 NERO26	ENFQ 120808 EL-33S	h_{max}	max 5.0						
			v_c	30-400*						
SN..1006..	SN.1006.042.01 SKY77	SNFQ 100610 EL-33S	h_{max}	max 3.0						
			v_c	30-400*						

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
EN..08T3..	EN.08T3.063.04 SKY77	ENFQ 08T310 EL-33S	h_{max}	max 3.0					
			v_c	30-400*					
	EN.08T3.063.04 NERO26	ENFQ 08T310 EL-33S	h_{max}	max 3.0					
			v_c	30-400*					
EN..1208..	EN.1208.041.04 SKY77	ENFQ 120808 EL-33S	h_{max}	max 5.0					
			v_c	30-400*					
	EN.1208.041.04 NERO26	ENFQ 120808 EL-33S	h_{max}	max 5.0					
			v_c	30-400*					
SN..1006..	SN.1006.042.01 SKY77	SNFQ 100610 EL-33S	h_{max}	max 3.0					
			v_c	30-400*					

* Parameters vibration-/surface-dependent

INS		
EN..08T3...	08B.0375.7991	TX208
EN..08T3... for K-EN08-g	08B.0309.7991	TX208
EN..1208...	08B.0516.7991	TX220
SN..1006...	08B.3511.7991	TX215

Mounting | CN/EN/FN indexable insert page 138


CW90



CB18
CN18

EB18
EN18

TB18
TN18

The right and left hand insert system and the smooth cutting of the side milling cutters provide the stability essential for complying with highly precise radial and axial run out tolerances. For a wide range of work piece specific challenges requiring the attainment of maximum precision and … maximum Q.

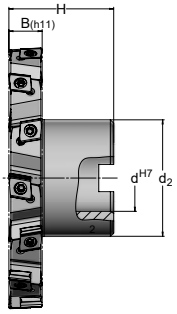
… take precision to the highest level

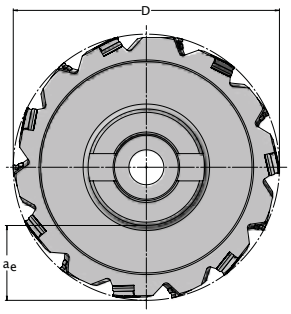
SIDE MILLING CUTTERS

SIDE MILLING CUTTERS TANGENTIAL
CB18 | CN18

NEWTOOL

4-cutting edge CN indexable insert
Fine tooth pitch through tangential insert design
Very smooth cutting through left and right hand inserts
Secondary cutting edge positioned outside of the cutting zone – face milling possible with CB18





CB18

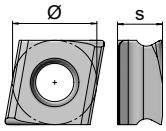
Article	D	d_2	d^{H7}	H	$B_{(h11)}$	zz	z_{eff}	a_e	lc	kg	INS
01C.1010.001	100	45	27	45	10	6x2	6	25.0	no	0.59	CN.07T3..
01C.1012.002	100	45	27	45	12	6x2	6	25.0	no	0.75	CN.07T3..
01C.1014.001	100	45	27	45	14	6x2	6	25.0	no	0.93	CN.07T3..
01C.1210.002	125	58	32	50	10	7x2	7	33.0	no	0.67	CN.07T3..
01C.1212.003	125	58	32	50	12	7x2	7	33.0	no	1.27	CN.07T3..
01C.1214.001	125	58	32	50	14	7x2	7	33.0	no	1.54	CN.07T3..
01C.1610.001	160	70	40	63	10	9x2	9	44.0	no	2.28	CN.07T3..
01C.1612.001	160	70	40	63	12	9x2	9	44.0	no	2.58	CN.07T3..
01C.1614.001	160	70	40	63	14	9x2	9	44.0	no	2.79	CN.07T3..

CN18

Article	D	d_2	d^{H7}	$B_{(h11)}$	zz	z_{eff}	a_e	lc	kg	INS
14C.1010.005	100	47	32	10	6x2	6	28.0	no	0.43	CN.07T3..
14C.1012.001	100	47	32	12	6x2	6	28.0	no	0.53	CN.07T3..
14C.1014.001	100	47	32	14	6x2	6	28.0	no	0.66	CN.07T3..
14C.1210.001	125	47	32	10	7x2	7	39.0	no	0.71	CN.07T3..
14C.1212.001	125	47	32	12	7x2	7	39.0	no	0.83	CN.07T3..
14C.1214.003	125	47	32	14	7x2	7	39.0	no	1.02	CN.07T3..
14C.1610.001	160	55	40	10	9x2	9	52.0	no	1.17	CN.07T3..
14C.1612.001	160	55	40	12	9x2	9	52.0	no	1.43	CN.07T3..
14C.1614.001	160	55	40	14	9x2	9	52.0	no	1.70	CN.07T3..

Width of cut $B_{(h11)}$ can only be achieved with an indexable insert with W-geometry. Other dimensions on request.

INS SHAPE **CN**



CN

AS	Ø	s
4	07	T3
	7.5	3.97

Matching of machining parameters
with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.16	0.16	0.15	0.13	0.12	0.10	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	CN.07T3.009.11 SKY77	CNHQ 07T306 SR-28W	h_{max}	0.16	0.16	0.15	0.13	0.12	0.10	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	290-320	260-295	230-270	210-240	180-210	140-180
	CN.07T3.008.11 NERO²77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	CN.07T3.009.11 SKY77	CNHQ 07T306 SR-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	290-320	260-295	230-270	210-240	180-210	140-180
	CN.07T3.009.11 NERO²77	CNHQ 07T306 SR-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

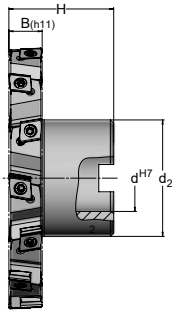
	Article	Designation		NF metals		
				E82	E81	E80
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.20	0.20	0.16
			v_c	650-1000	450-650	280-450
	CN.07T3.009.11 SKY77	CNHQ 07T306 SR-28W	h_{max}	0.20	0.20	0.16
			v_c	650-1000	450-650	280-450

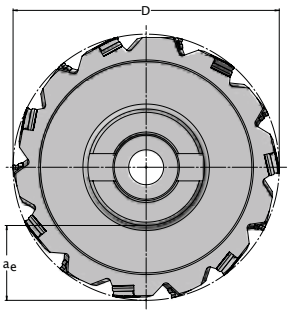
INS		
CN..07T3...	08B.0309.7991	TX208

Mounting | CN/EN/FN indexable insert page 138

SIDE MILLING CUTTERS TANGENTIAL
EB18

4-cutting edge EN indexable insert
Fine tooth pitch through tangential insert design
Very smooth cutting through left and right hand inserts
Secondary cutting edge positioned outside of the cutting zone – face milling possible with EB18





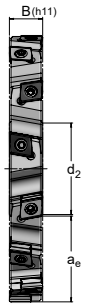
EB18

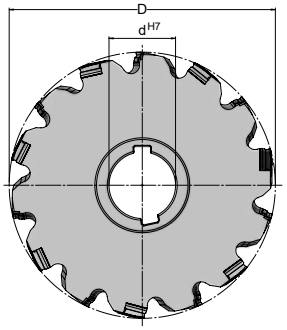
Article	D	d_2	d^{H7}	H	$B_{(h11)}$	zz	z_{eff}	a_e	Ic	kg	INS
01E.1214.001	125	58	32	50	14	7 x 2	7	32.0	no	1.54	EN..08T3.R/L
01E.1216.001	125	58	32	50	16	6 x 2	6	32.0	no	1.64	EN..0904.R/L
01E.1218.001	125	58	32	50	18	6 x 2	6	32.0	no	1.77	EN..0904.R/L
01E.1614.001	160	70	40	63	14	9 x 2	9	43.0	no	2.80	EN..08T3.R/L
01E.1616.001	160	70	40	63	16	8 x 2	8	43.0	no	2.83	EN..0904.R/L
01E.1618.001	160	70	40	63	18	8 x 2	8	43.0	no	3.10	EN..0904.R/L
01E.1620.001	160	70	40	63	20	7 x 2	7	43.0	no	3.20	EN..1206.R/L
01E.1622.001	160	70	40	63	22	7 x 2	7	43.0	no	3.40	EN..1206.R/L
01E.1624.001	160	70	40	63	24	7 x 2	7	43.0	no	3.63	EN..1206.R/L
01E.2018.003	200	70	40	63	18	9 x 2	9	63.0	no	4.50	EN..0904.R/L
01E.2020.007	200	70	40	63	20	9 x 2	9	63.0	no	4.70	EN..1206.R/L
01E.2022.002	200	70	40	63	22	9 x 2	9	63.0	no	5.07	EN..1206.R/L
01E.2520.004	250	90	50	68	20	11 x 2	11	78.0	no	7.50	EN..1206.R/L
01E.2524.004	250	90	50	68	24	11 x 2	11	78.0	no	8.74	EN..1206.R/L

Width of cut $B_{(h11)}$ can only be achieved with an indexable insert with W-geometry. Other dimensions on request.

SIDE MILLING CUTTERS TANGENTIAL
EN18

4-cutting edge EN indexable insert
Fine tooth pitch through tangential insert design
Very smooth cutting through left and right hand inserts
Secondary cutting edge positioned outside of the cutting zone



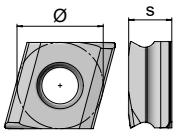


EN18

Article	D	d_2	d^{H7}	$B_{(h11)}$	zz	z_{eff}	a_e	Ic	kg	INS
14E.1214.001	125	46	32	14	7 x 2	7	37.0	no	1.00	EN..08T3.R/L
14E.1216.001	125	46	32	16	6 x 2	6	37.0	no	1.19	EN..0904.R/L
14E.1218.001	125	46	32	18	6 x 2	6	37.0	no	1.33	EN..0904.R/L
14E.1614.003	160	55	40	14	9 x 2	9	50.0	no	1.70	EN..08T3.R/L
14E.1616.001	160	55	40	16	8 x 2	8	50.0	no	1.87	EN..0904.R/L
14E.1618.001	160	55	40	18	8 x 2	8	50.0	no	2.14	EN..0904.R/L
14E.1620.005	160	55	40	20	7 x 2	7	50.0	no	2.35	EN..1206.R/L
14E.1622.001	160	55	40	22	7 x 2	7	50.0	no	2.71	EN..1206.R/L
14E.1624.001	160	55	40	24	7 x 2	7	50.0	no	2.87	EN..1206.R/L
14E.2020.001	200	68	50	20	9 x 2	9	63.0	no	3.57	EN..1206.R/L

Width of cut $B_{(h11)}$ can only be achieved with an indexable insert with W-geometry. Other dimensions on request.

INS SHAPE **EN**



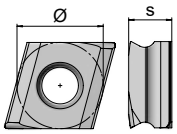
EN

AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.15	0.12	0.12	0.10	0.08
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.08T3.014.09 SKY77	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.15	0.12	0.12	0.10	0.08
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.15	0.12	0.12	0.10	0.08
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.08T3.016.26 SKY77	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.15	0.12	0.12	0.10	0.08
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.08T3.001.54 SKY77	ENHQ 08T306 SL-30	h_{max}	–	–	–	0.11	0.11	0.09	0.08
			v_c	–	–	–	160-210	140-180	110-140	80-110
	EN.08T3.002.54 SKY77	ENHQ 08T306 SR-30	h_{max}	–	–	–	0.11	0.11	0.09	0.08
			v_c	–	–	–	160-210	140-180	110-140	80-110
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0.18	0.18	0.18	0.15	0.15	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.0904.022.12 SKY77	ENHQ 090408 SR-28W	h_{max}	0.18	0.18	0.18	0.15	0.15	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.18	0.15	0.15	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.0904.016.26 SKY77	ENHQ 090408 SR-28V	h_{max}	0.18	0.18	0.18	0.15	0.15	0.12	0.10
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	–	–	–	0.13	0.13	0.10	0.08
			v_c	–	–	–	160-210	140-180	110-140	80-110
	EN.0904.002.54 SKY77	ENHQ 090408 SR-30	h_{max}	–	–	–	0.13	0.13	0.10	0.08
			v_c	–	–	–	160-210	140-180	110-140	80-110

INS SHAPE **EN**



EN

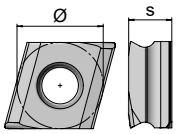
AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0.22	0.22	0.22	0.20	0.18	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	EN.1206.026.18 SKY77	ENHQ 120610 SR-25V	h_{max}	0.22	0.22	0.22	0.20	0.18	–	–
			v_c	200-280	190-230	180-220	160-210	140-180	–	–
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0.20	0.20	0.20	0.18	0.16	0.15	0.11
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.1206.030.13 SKY77	ENHQ 120610 SR-28W	h_{max}	0.20	0.20	0.20	0.18	0.16	0.15	0.11
			v_c	200-280	190-230	180-220	160-210	140-180	110-140	80-110
	EN.1206.003.54 SKY77	ENHQ 120610 SL-30	h_{max}	–	–	–	0.16	0.14	0.12	0.10
			v_c	–	–	–	160-210	140-180	110-140	80-110
	EN.1206.002.54 SKY77	ENHQ 120610 SR-30	h_{max}	–	–	–	0.16	0.14	0.12	0.10
			v_c	–	–	–	160-210	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.08T3.012.09 NERO26	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.08T3.014.09 SKY77	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.08T3.014.09 NERO26	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.08T3.017.26 NERO26	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.08T3.016.26 SKY77	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.08T3.016.26 NERO26	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.15	0.12	0.10	0.08
			v_c	240-300	240-300	220-260	200-240	180-210	140-180

INS SHAPE **EN**



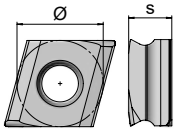
EN

AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

				Cast iron					
	Article	Designation		D21	D20	D19	D18	D17	D16
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.023.12 NERO26	ENHQ 090408 SL-28W	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.0904.022.12 SKY77	ENHQ 090408 SR-28W	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.022.12 NERO26	ENHQ 090408 SR-28W	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.017.26 NERO26	ENHQ 090408 SL-28V	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.0904.016.26 SKY77	ENHQ 090408 SR-28V	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.0904.016.26 NERO26	ENHQ 090408 SR-28V	h_{max}	0,18	0,18	0,18	0,15	0,12	0,10
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0,25	0,25	0,22	0,20	0,18	0,13
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.027.18 NERO26	ENHQ 120610 SL-25V	h_{max}	0,25	0,25	0,22	0,20	0,18	0,13
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.026.18 SKY77	ENHQ 120610 SR-25V	h_{max}	0,25	0,25	0,22	0,20	0,18	0,13
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.026.18 NERO26	ENHQ 120610 SR-25V	h_{max}	0,25	0,25	0,22	0,20	0,18	0,13
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0,23	0,23	0,21	0,18	0,17	0,12
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.029.13 NERO26	ENHQ 120610 SL-28W	h_{max}	0,23	0,23	0,21	0,18	0,17	0,12
			v_c	240-300	240-300	220-260	200-240	180-210	140-180
	EN.1206.030.13 SKY77	ENHQ 120610 SR-28W	h_{max}	0,23	0,23	0,21	0,18	0,17	0,12
			v_c	200-280	200-260	180-230	170-210	160-190	140-180
	EN.1206.030.13 NERO26	ENHQ 120610 SR-28W	h_{max}	0,23	0,23	0,21	0,18	0,17	0,12
			v_c	240-300	240-300	220-260	200-240	180-210	140-180

INS SHAPE **EN**



EN

AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

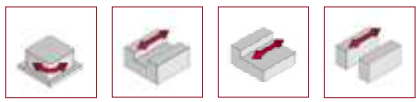
Matching of machining parameters
with the AV material groups

				NF metals		
	Article	Designation		E82	E81	E80
EN..08T3..	EN.08T3.001.54 SKY77	ENHQ 08T306 SL-30	h_{max}	0,18	0,15	0,12
			v_c	650-1000	450-650	280-450
	EN.08T3.002.54 SKY77	ENHQ 08T306 SR-30	h_{max}	0,18	0,15	0,12
			v_c	650-1000	450-650	280-450
EN..0904..	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	0,20	0,18	0,15
			v_c	650-1000	450-650	280-450
	EN.0904.002.54 SKY77	ENHQ 090408 SR-30	h_{max}	0,20	0,18	0,15
			v_c	650-1000	450-650	280-450
EN..1206..	EN.1206.003.54 SKY77	ENHQ 120610 SL-30	h_{max}	0,25	0,20	0,18
			v_c	650-1000	450-650	280-450
	EN.1206.002.54 SKY77	ENHQ 120610 SR-30	h_{max}	0,25	0,20	0,18
			v_c	650-1000	450-650	280-450

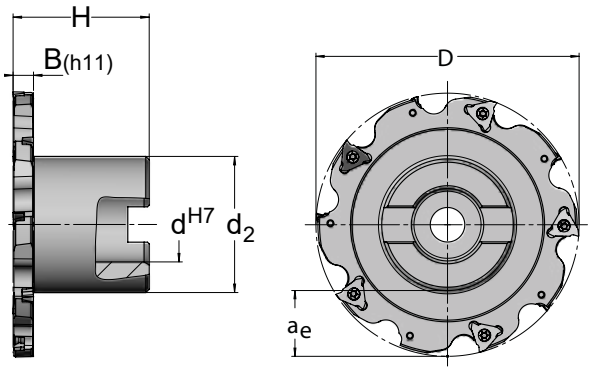
INS		
EN..08T3...	08B.0309.7991	TX208
EN..0904...	08B.3511.7991	TX215
EN..1206...	08B.0513.7991	TX220

Mounting | CN/EN/FN indexable insert page 138

SIDE MILLING CUTTERS
TB18



Extremely smooth cutting through left and right hand inserts – highly precise widths of cut from 4–12 mm
Complies with narrow radial and axial run out tolerances
3-side embedding of the T-style indexable insert

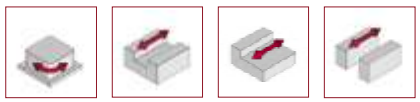


TB18

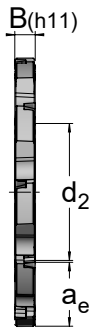
Article	D	d_2	d^{H7}	H	$B_{(h11)}$	zz	z_{eff}	a_e	Ic	kg	INS
01T.0604.041	63	32	16	32	4	4 x 2	4	13.0	no	0.21	TN..1302.R/L
01T.0605.001	63	32	16	32	5	4 x 2	4	13.0	no	0.22	TC..1102.R/L
01T.0606.001	63	32	16	32	6	4 x 2	4	13.0	no	0.23	TC..1103.R/L
01T.0610.001	63	32	16	32	10	3 x 2	3	13.0	no	0.30	TN..1606.R/L
01T.0804.041	80	40	22	40	4	5 x 2	5	13.0	no	0.37	TN..1302.R/L
01T.0805.001	80	40	22	40	5	5 x 2	5	18.0	no	0.39	TC..1102.R/L
01T.0806.001	80	40	22	40	6	5 x 2	5	18.0	no	0.41	TC..1103.R/L
01T.0808.001	80	40	22	40	8	4 x 2	4	18.0	no	0.47	TN..1604.R/L
01T.0810.001	80	40	22	40	10	4 x 2	4	18.0	no	0.53	TN..1606.R/L
01T.0812.001	80	40	22	40	12	4 x 2	4	18.0	no	0.57	TN..1606.R/L*
01T.1004.041	100	45	27	45	4	8 x 2	8	18.0	no	0.67	TN..1302.R/L
01T.1005.001	100	45	27	45	5	7 x 2	7	25.0	no	0.58	TC..1102.R/L
01T.1006.001	100	45	27	45	6	7 x 2	7	25.0	no	0.62	TC..1103.R/L
01T.1008.001	100	45	27	45	8	5 x 2	5	25.0	no	0.70	TN..1604.R/L
01T.1010.001	100	45	27	45	10	5 x 2	5	25.0	no	0.79	TN..1606.R/L
01T.1012.001	100	45	27	45	12	5 x 2	5	25.0	no	0.86	TN..1606.R/L*
01T.1204.042	125	58	32	50	4	9 x 2	9	32.0	no	0.67	TN..1302.R/L
01T.1205.001	125	58	32	50	5	9 x 2	9	32.0	no	1.04	TC..1102.R/L
01T.1206.001	125	58	32	50	6	9 x 2	9	32.0	no	1.09	TC..1103.R/L
01T.1208.001	125	58	32	50	8	6 x 2	6	32.0	no	1.22	TN..1604.R/L
01T.1210.001	125	58	32	50	10	6 x 2	6	32.0	no	1.36	TN..1606.R/L
01T.1212.001	125	58	32	50	12	6 x 2	6	32.0	no	1.49	TN..1606.R/L*
01T.1606.001	160	68	40	63	6	11 x 2	11	44.0	no	1.85	TC..1103.R/L
01T.1607.001	160	68	40	63	7	8 x 2	8	44.0	no	1.97	TN..16T3.R/L
01T.1608.001	160	68	40	63	8	8 x 2	8	44.0	no	2.08	TN..1604.R/L
01T.1609.001	160	68	40	63	9	8 x 2	8	44.0	no	2.20	TN..1604.R/L*
01T.1610.001	160	68	40	63	10	8 x 2	8	44.0	no	2.32	TN..1606.R/L
01T.1612.001	160	68	40	63	12	8 x 2	8	44.0	no	2.40	TN..1606.R/L*

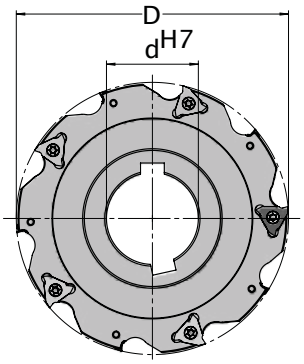
* Note that the screw length required varies depending on the insert used. Other dimensions on request.

SIDE MILLING CUTTERS
TN18



Extremely smooth cutting through left and right hand inserts – highly precise widths of cut from 4–12 mm
Complies with narrow radial and axial run out tolerances
3-side embedding of the T-style indexable insert



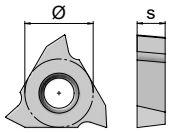


TN18

Article	D	d_2	d^{H7}	$B_{(h11)}$	zz	z_{eff}	a_e	lc	kg	INS
14T.0604.041	63	34	22	4	4 x 2	4	12.0	no	0.07	TN..1302.R/L
14T.0605.001	63	34	22	5	4 x 2	4	12.0	no	0.08	TC..1102.R/L
14T.0606.001	63	34	22	6	4 x 2	4	12.0	no	0.10	TC..1103.R/L
14T.0804.041	80	40	27	4	5 x 2	5	12.0	no	0.11	TN..1302.R/L
14T.0805.001	80	40	27	5	5 x 2	5	18.0	no	0.14	TC..1102.R/L
14T.0806.001	80	40	27	6	5 x 2	5	18.0	no	0.17	TC..1103.R/L
14T.0810.001	80	40	27	10	4 x 2	4	18.0	no	0.30	TN..1606.R/L
14T.1004.041	100	40	32	4	7 x 2	7	25.0	no	0.28	TN..1302.R/L
14T.1005.001	100	46	32	5	7 x 2	7	25.0	no	0.21	TC..1102.R/L
14T.1006.001	100	46	32	6	7 x 2	7	25.0	no	0.27	TC..1103.R/L
14T.1007.001	100	46	32	7	5 x 2	5	25.0	no	0.32	TN..16T3.R/L
14T.1008.001	100	46	32	8	5 x 2	5	25.0	no	0.37	TN..1604.R/L
14T.1009.001	100	46	32	9	5 x 2	5	25.0	no	0.42	TN..1604.R/L*
14T.1010.001	100	46	32	10	5 x 2	5	25.0	no	0.47	TN..1606.R/L
14T.1012.001	100	46	32	12	5 x 2	5	25.0	no	0.57	TN..1606.R/L*
14T.1204.041	125	46	32	4	9 x 2	9	37.0	no	0.28	TN..1302.R/L
14T.1205.001	125	46	32	5	9 x 2	9	37.0	no	0.36	TC..1102.R/L
14T.1206.001	125	46	32	6	9 x 2	9	37.0	no	0.44	TC..1103.R/L
14T.1207.001	125	46	32	7	6 x 2	6	37.0	no	0.52	TN..16T3.R/L
14T.1208.001	125	46	32	8	6 x 2	6	37.0	no	0.61	TN..1604.R/L
14T.1209.001	125	46	32	9	6 x 2	6	37.0	no	0.69	TN..1604.R/L*
14T.1210.001	125	46	32	10	6 x 2	6	37.0	no	0.78	TN..1606.R/L
14T.1212.001	125	46	32	12	6 x 2	6	37.0	no	0.92	TN..1606.R/L*
14T.1606.001	160	55	40	6	11 x 2	11	50.0	no	0.72	TC..1103.R/L
14T.1607.001	160	55	40	7	8 x 2	8	50.0	no	0.84	TN..16T3.R/L
14T.1608.001	160	55	40	8	8 x 2	8	50.0	no	0.97	TN..1604.R/L
14T.1609.001	160	55	40	9	8 x 2	8	50.0	no	1.12	TN..1604.R/L*
14T.1610.001	160	55	40	10	8 x 2	8	50.0	no	1.25	TN..1606.R/L
14T.1612.001	160	55	40	12	8 x 2	8	50.0	no	1.54	TN..1606.R/L*
14T.2007.001	200	55	40	7	10 x 2	10	70.0	no	1.40	TN..16T3.R/L
14T.2008.001	200	55	40	8	10 x 2	10	70.0	no	1.59	TN..1604.R/L
14T.2009.001	200	55	40	9	10 x 2	10	70.0	no	1.81	TN..1604.R/L*
14T.2010.001	200	55	40	10	10 x 2	10	70.0	no	1.98	TN..1606.R/L
14T.2012.001	200	55	40	12	10 x 2	10	70.0	no	2.43	TN..1606.R/L*
14T.2508.001	250	68	50	8	12 x 2	12	89.0	no	2.51	TN..1604.R/L
14T.2510.001	250	68	50	10	12 x 2	12	89.0	no	3.22	TN..1606.R/L
14T.2512.001	250	68	50	12	12 x 2	12	89.0	no	3.91	TN..1606.R/L*

* Note that the screw length required varies depending on the insert used. Other dimensions on request.

INS SHAPE **TC | TN**



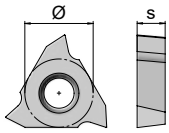
TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
TC..1102..	TC.1102.004.35 SKY77	TCAW 1102ZZ TL-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1102.005.35 SKY77	TCAW 1102ZZ TR-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1102.004.40 SKY77	TCAW 110206 TL-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1102.005.40 SKY77	TCAW 110206 TR-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
TC..1103..	TC.1103.007.27 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.006.27 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.007.28 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.006.28 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.12	0.10	0.10	0.08	0.08	0.06	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
TN..1302..	TN.1302.140.06 SKY77	TNAX 130203 SL-28	h_{max}	0.14	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1302.141.06 SKY77	TNAX 130203 SR-28	h_{max}	0.14	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
TN..16T3..	TN.16T3.004.14 SKY77	TNAW 16T3ZZ TL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.16T3.003.14 SKY77	TNAW 16T3ZZ TR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.16T3.003.25 SKY77	TNAW 16T308 SR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.16T3.004.25 SKY77	TNAW 16T308 SL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

INS SHAPE **TC | TN**



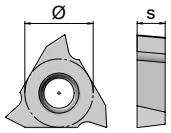
TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
TN..1604..	TN.1604.004.41 SKY77	TNAW 1604ZZ TR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1604.003.41 SKY77	TNAW 1604ZZ TL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1604.004.46 SKY77	TNAW 160408 SL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1604.003.46 SKY77	TNAW 160408 SR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
TN..1606..	TN.1606.004.49 SKY77	TNAW 1606ZZ TL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1606.003.49 SKY77	TNAW 1606ZZ TR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1606.004.60 SKY77	TNAW 160608 SL-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1606.003.60 SKY77	TNAW 160608 SR-28	h_{max}	0.16	0.16	0.16	0.14	0.12	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

INS SHAPE **TC | TN**



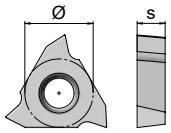
TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
TC..1102..	TC.1102.004.35 SKY77	TCAW 1102ZZ TL-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1102.005.35 SKY77	TCAW 1102ZZ TR-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1102.004.40 SKY77	TCAW 110206 TL-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1102.005.40 SKY77	TCAW 110206 TR-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
TC..1103..	TC.1103.007.27 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1103.006.27 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1103.007.28 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TC.1103.006.28 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.12	0.12	0.10	0.10	0.08	0.06
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
TN..1302..	TN.1302.140.06 SKY77	TNAX 130203 SL-28	h_{max}	0.14	0.14	0.12	0.12	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1302.141.06 SKY77	TNAX 130203 SR-28	h_{max}	0.14	0.14	0.12	0.12	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
TN..16T3..	TN.16T3.004.14 SKY77	TNAW 16T3ZZ TL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.16T3.003.14 SKY77	TNAW 16T3ZZ TR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.16T3.003.25 SKY77	TNAW 16T308 SR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.16T3.004.25 SKY77	TNAW 16T308 SL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180

INS SHAPE **TC | TN**



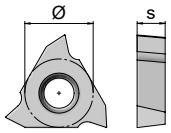
TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

				Cast iron					
	Article	Designation		D21	D20	D19	D18	D17	D16
TN..1604..	TN.1604.004.41 SKY77	TNAW 1604ZZ TR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1604.004.41 NERO26	TNAW 1604ZZ TR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1604.003.41 SKY77	TNAW 1604ZZ TL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1604.003.41 NERO26	TNAW 1604ZZ TL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1604.004.46 SKY77	TNAW 160408 SL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1604.004.46 NERO26	TNAW 160408 SL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1604.003.46 SKY77	TNAW 160408 SR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1604.003.46 NERO26	TNAW 160408 SR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
TN..1606..	TN.1606.004.49 SKY77	TNAW 1606ZZ TL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1606.004.49 NERO26	TNAW 1606ZZ TL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1606.003.49 SKY77	TNAW 1606ZZ TR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1606.003.49 NERO26	TNAW 1606ZZ TR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1606.004.60 SKY77	TNAW 160608 SL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1606.004.60 NERO26	TNAW 160608 SL-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1606.003.60 SKY77	TNAW 160608 SR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	280-320	260-290	210-260	190-240	180-210	140-180
	TN.1606.003.60 NERO26	TNAW 160608 SR-28	h_{max}	0.18	0.18	0.15	0.13	0.10	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

INS SHAPE **TC | TN**



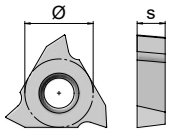
TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

				Stainless steels				NF metals		
	Article	Designation		C12	C11	C10	C09	E82	E81	E80
TC..1102..	TC.1102.004.35 SKY77	TCAW 1102ZZ TL-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1102.005.35 SKY77	TCAW 1102ZZ TR-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1102.004.40 SKY77	TCAW 110206 TL-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1102.005.40 SKY77	TCAW 110206 TR-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
TC..1103..	TC.1103.007.27 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1103.006.27 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1103.007.28 SKY77	TCAW 1103ZZ TL-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TC.1103.006.28 SKY77	TCAW 1103ZZ TR-28	h_{max}	0.10	0.08	0.07	0.05	0.15	0.12	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
TN..1302..	TN.1302.140.06 SKY77	TNAX 130203 SL-28	h_{max}	0.10	0.08	0.07	0.05	0.17	0.15	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1302.141.06 SKY77	TNAX 130203 SR-28	h_{max}	0.10	0.08	0.07	0.05	0.17	0.15	0.10
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
TN..16T3..	TN.16T3.004.14 SKY77	TNAW 16T3ZZ TL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.16T3.003.14 SKY77	TNAW 16T3ZZ TR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.16T3.003.25 SKY77	TNAW 16T308 SR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.16T3.004.25 SKY77	TNAW 16T308 SL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450

INS SHAPE **TC | TN**



TC | TN

AS	Ø			s				
3	11	13	16	02	03	T3	04	06
	6.35	8	9.52	2.6	3.2	3.97	4.76	6.4

Matching of machining parameters with the AV material groups

	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
TN..1604..	TN.1604.004.41 SKY77	TNAW 1604ZZ TR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1604.003.41 SKY77	TNAW 1604ZZ TL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1604.004.46 SKY77	TNAW 160408 SL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1604.003.46 SKY77	TNAW 160408 SR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
TN..1606..	TN.1606.004.49 SKY77	TNAW 1606ZZ TL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1606.003.49 SKY77	TNAW 1606ZZ TR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1606.004.60 SKY77	TNAW 160608 SL-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450
	TN.1606.003.60 SKY77	TNAW 160608 SR-28	h_{max}	0.12	0.10	0.08	0.07	0.20	0.18	0.15
			v_c	120-200	140-150	100-140	60-100	650-1000	450-650	280-450

INS		
TC..1102...	08B.2538.7991	TX208
TC..1103...	08B.2552.7991	TX208
TN..11T3...	08B.0354.7991	TX208
TN..1302...	08B.0334.001	TX208
TN..1604...	08B.0364.7991	TX208
TN..1604...*	08B.0375.7991	TX208
TN..1606...	08B.3585.7991	TX215
TN..1606...*	08B.3509.7991	TX215

* Note that the screw length required varies depending on the insert used

Mounting | TC/TN indexable insert page 137

RO18

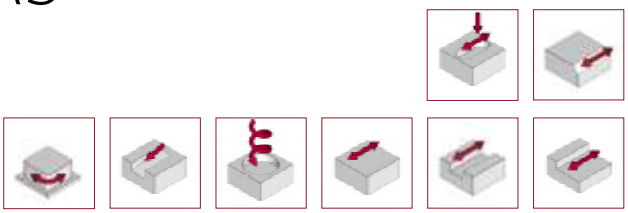
UD90

Copy milling cutters are specifically designed for high performance milling jobs that require extreme precision. The stable embedding of the indexable inserts delivers the required stability for precision and maximum Q in all machining applications, such as pocket milling or 90°-machining.

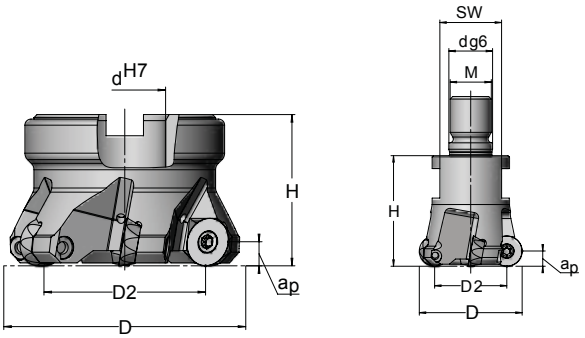
High performance milling
with max. Q

COPY MILLING CUTTERS
HIGH FEED MILLING CUTTERS

COPY MILLING CUTTERS
RO18



The RDGX indexable insert with facets prevents twisting and defines the fixation in the tool body
The axial and radial cutting angle guarantees a soft cut



RO18
Screw-in milling cutters

Article	D	D_2	d_{g6}	H	M	SW	z_{eff}	a_p	Ramp	Ic	kg	INS
18R.2028.001	20	10	10.5	28	10	15	2	5.0	–	no	0.05	RD..10T3.N*
18R.2433.001	24	12	12.5	33	12	17	2	6.0	5°	no	0.09	RD..1204.N*
18R.3243.003	32	20	17.0	43	16	24	3	6.0	4°	no	0.21	RD..1204.N
18R.3243.004	32	22	17.0	43	16	24	4	5.0	4°	yes	0.22	RD..10T3.N
18R.4043.001	40	28	17.0	43	16	24	4	6.0	3°	no	0.25	RD..1204.N
18R.4043.002	40	28	17.0	43	16	24	3	6.0	3°	no	0.23	RD..1204.N

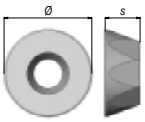
* Note that the screw length required varies depending on the insert used

RO18
Plug-in milling cutters

Article	D	D_2	d^{H7}	H	z_{eff}	a_p	Ramp	Ic	kg	INS
18R.5050.001	50	38	22	50	5	6.0	3°	yes	0.30	RD..1204.N
18R.5050.002	50	40	22	50	5	5.0	3°	yes	0.31	RD..10T3.N
18R.5250.001	52	40	22	50	5	6.0	3°	yes	0.35	RD..1204.N
18R.5250.002	52	42	22	50	6	5.0	3°	yes	0.35	RD..10T3.N
18R.6350.021	63	51	27	50	6	6.0	3°	yes	0.46	RD..1204.N
18R.6350.001	63	47	27	50	5	8.0	3°	yes	0.42	RD..1605.N
18R.6650.001	66	50	27	50	5	8.0	4°	yes	0.51	RD..1605.N
18R.6650.005	66	56	27	50	8	5.0	4°	yes	0.51	RD..10T3.N
18R.8050.002	80	64	27	50	6	8.0	3°	yes	0.96	RD..1605.N
18R.1050.002	100	84	32	50	7	8.0	3°	yes	1.49	RD..1605.N
18R.1263.001	125	109	40	63	8	8.0	2°	yes	2.91	RD..1605.N

Tool holders/adapters page 120

INS SHAPE **RD**



RD

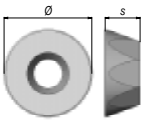
AS	Ø			s		
8	10	12	16	T3	04	05
	10	12	16	3.97	4.76	5

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_p at 1/4 INS-Ø	Steel						
				A22	A21	A20	A19	A18	A17	A16
RD..10T3	RD.10T3.031.01 AV1055	RDKT 10T3M0 SN-25	f_z	0.75	0.65	0.60	0.55	0.50	0.40	0.35
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	RD.10T3.031.02 AV1055	RDKT 10T3M0 SN-28	f_z	0.65	0.60	0.55	0.50	0.45	0.35	0.25
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30	f_z	–	–	–	–	–	0.30	0.25
			v_c	–	–	–	–	–	120-155	100-130
RD..1204..	RD.1204.031.02 SKY77	RDKT 1204M0 SN-25	f_z	0.75	0.65	0.60	0.55	0.50	0.40	0.35
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	RD.1204.031.03 AV1055	RDKT 1204M0 SN-28	f_z	–	–	–	–	0.45	0.35	0.30
			v_c	–	–	–	–	160-210	120-155	100-130
	RD.1204.031.04 AV1055	RDKT 1204M0 EN-30	f_z	–	–	–	–	–	0.30	0.25
			v_c	–	–	–	–	–	120-155	100-130
RD..1605..	RD.1605.031.01 SKY77	RDKT 1605M0 SN-23	f_z	0.65	0.60	0.55	0.50	0.45	0.35	0.25
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	RD.1605.031.02 AV1055	RDKT 1605M0 SN-28	f_z	–	–	–	–	0.45	0.35	0.30
			v_c	–	–	–	–	160-210	120-155	100-130

	Article	Designation	Recomm. a_p at 1/4 INS-Ø	Cast iron					
				D21	D20	D19	D18	D17	D16
RD..10T3	RD.10T3.031.01 SKY77	RDKT 10T3M0 SN-25	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
	RD.10T3.031.01 AV1055	RDKT 10T3M0 SN-25	f_z	0.70	0.55	0.50	0.45	0.45	0.30
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
	RD.10T3.031.02 AV1055	RDKT 10T3M0 SN-28	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
RD..1204..	RD.1204.001.02 SKY77	RDGX 1204MO TN-25	f_z	0.70	0.55	0.50	0.45	0.45	0.30
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
	RD.1204.031.02 SKY77	RDKT 1204M0 SN-25	f_z	0.70	0.55	0.50	0.45	0.45	0.30
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
RD..1605..	RD.1605.001.02 SKY77	RDGX 1605MO TN-25	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
	RD.1605.031.01 SKY77	RDKT 1605M0 SN-23	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180

INS SHAPE **RD**



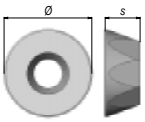
RD

AS	Ø			s		
8	10	12	16	T3	04	05
	10	12	16	3.97	4.76	5

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_p at 1/4 INS-Ø		Stainless steels				NF metals		
					C12	C11	C10	C09	E82	E81	E80
RD..10T3	RD.10T3.031.02 AV1055	RDKT 10T3M0 SN-28		f_z	–	–	–	–	1.00	0.85	0.50
				v_c	–	–	–	–	650-1000	450-650	280-450
	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30		f_z	0.50	0.35	0.30	0.25	0.85	0.70	0.45
				v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450
RD..1204..	RD.1204.031.02 SKY77	RDKT 1204M0 SN-25		f_z	0.50	–	–	–	1.00	0.65	0.55
				v_c	100-150	–	–	–	650-1000	450-650	280-450
	RD.1204.031.03 AV1055	RDKT 1204M0 SN-28		f_z	0.50	0.40	0.35	0.25	1.00	0.70	0.50
				v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450
	RD.1204.031.04 AV1055	RDKT 1204M0 EN-30		f_z	0.50	0.35	0.30	0.25	0.85	0.70	0.45
				v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450
RD..1605..	RD.1605.031.01 SKY77	RDKT 1605M0 SN-23		f_z	0.50	0.40	0.35	0.25	1.00	0.85	0.50
				v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450
	RD.1605.031.02 AV1055	RDKT 1605M0 SN-28		f_z	0.50	0.40	0.35	0.25	1.00	0.70	0.50
				v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450

INS SHAPE **RD**



RD

AS	Ø			s		
8	10	12	16	T3	04	05
	10	12	16	3.97	4.76	5

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_p at 1/4 INS-Ø	Titanium		
				S10	S09	S08
RD..10T3	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30	f_z	0.35	0.30	0.25
			v_c	60-80	40-70	20-50
RD..1204..	RD.1204.031.03 AV1055	RDKT 1204M0 SN-28	f_z	0.45	0.35	–
			v_c	60-80	40-70	–
	RD.1204.031.04 AV1055	RDKT 1204M0 EN-30	f_z	0.35	0.30	0.25
			v_c	60-80	40-70	20-50
RD..1605..	RD.1605.031.02 AV1055	RDKT 1605M0 SN-28	f_z	0.45	0.35	–
			v_c	60-80	40-70	–

Adaptation of f_z at different a_p values

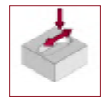
INS	a_p	0,5	1	1,5	2	2,5	3	3,5	4	5	6	7	8
RD..10T3...	f_z	2.00	1.50	1.25	1.10	1.00	0.95	0.90	0.85	0.90	–	–	–
RD..1204...	f_z	2.10	1.50	1.30	1.15	1.10	1.00	0.95	0.90	0.85	0.85	–	–
RD..1605...	f_z	2.40	1.80	1.50	1.30	1.20	1.10	1.05	1.00	0.95	0.90	0.85	0.85

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

* Note that the screw length required varies depending on the insert used

Technical information ramp and **adaptation of f_z at different a_p values** page 144

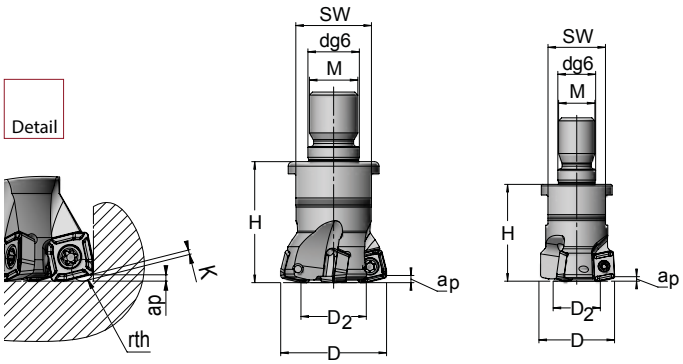
HIGH FEED MILLING CUTTERS
UD90



NEWTOOL

The versions with Ø 16–50 mm are optimal for powerful milling on live tooling lathes and machining centers with rather low rigidity and drive power

DIN tool holders with standard adaptation shank and spindle connection for HSK, Capto and SK



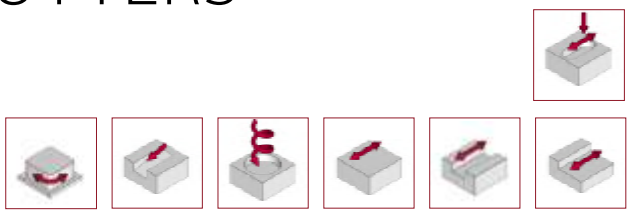
UD90
Screw-in milling cutters

Article	D	D_2	d_{g6}	H	M	SW	z_{eff}	a_p	rth	K	Ramp	Ic	kg	INS
18U.1625.130	16	6.6	8.5	25	8	12	2	1.0	1.5	0.7	3°	yes	0.05	UD..0602.R*
18U.2025.130	20	10.6	10.5	25	10	15	2	1.0	1.5	0.7	3°	yes	0.05	UD..0602.R
18U.2532.130	25	15.6	12.5	32	12	19	3	1.0	1.5	0.7	3°	yes	0.10	UD..0602.R
18U.2532.080	25	14.6	12.5	32	12	17	2	1.3	2.1	0.8	4°	yes	0.10	UD..0803.R
18U.3240.130	32	22.6	17	40	16	27	4	1.0	1.5	0.7	2.5°	yes	0.21	UD..0602.R
18U.3240.080	32	21.7	17	40	16	25	4	1.3	2.1	0.8	2.8°	yes	0.18	UD..0803.R
18U.3240.100	32	18.6	17	40	16	25	3	1.7	2.5	1.0	3.5°	yes	0.19	UD..10T3.R
18U.3540.130	35	25.6	17	40	16	30	5	1.0	1.5	0.7	2.5°	yes	0.25	UD..0602.R
18U.3540.080	35	24.7	17	40	16	27	4	1.3	2.1	0.8	2.5°	yes	0.22	UD..0803.R
18U.3540.100	35	21.6	17	40	16	25	4	1.7	2.5	1.0	2.9°	yes	0.20	UD..10T3.R
18U.3540.070	35	19.6	17	40	16	30	3	2.0	2.5	1.3	3.8°	yes	0.25	UD..1204.R
18U.4040.130	40	30.6	17	40	16	32	5	1.0	1.5	0.7	2.0°	yes	0.32	UD..0602.R
18U.4040.080	40	27.2	17	40	16	30	5	1.3	2.1	0.8	2.3°	yes	0.26	UD..0803.R
18U.4040.100	40	26.6	17	40	16	30	4	1.7	2.5	1.0	2.5°	yes	0.27	UD..10T3.R
18U.5040.070	50	33.5	17	40	16	30	5	2.0	2.5	1.3	3.0°	yes	0.36	UD..1204.R*

* Note that the screw length required varies depending on the insert used

Tool holders/adapters page 120

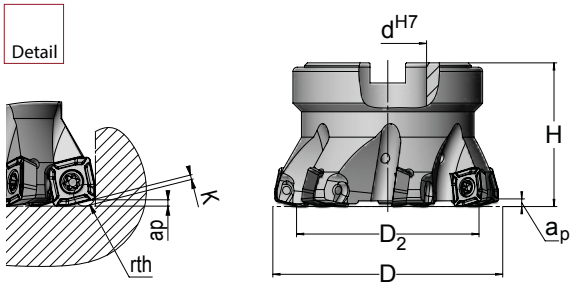
HIGH FEED MILLING CUTTERS
UD90



NEWTOOL

Suitable for universal use, with 4-cutting edge UDGT indexable insert, in particular for high alloy steels
"Soft" cutting ensures maximum metal removal rate Q even in case of extreme overhang – ideal for pocket milling
Remarkable finishing quality even at high feed rates – excellent surface quality

Detail

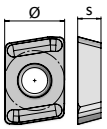


UD90
Plug-in milling cutters

Article	D	D_2	d^{H7}	H	z_{eff}	a_p	rth	K	Ramp	lc	kg	INS
18U.5050.100	50	36.6	22	50	6	1.7	2.5	1.0	2.1°	yes	0.38	UD..10T3.R
18U.5050.070	50	33.5	22	50	5	2.0	2.5	1.3	3.0°	yes	0.36	UD..1204.R*
18U.5250.100	52	38.6	22	50	6	1.7	2.5	1.0	1.9°	yes	0.40	UD..10T3.R
18U.5250.070	52	36.6	22	50	5	2.0	2.5	1.3	3.0°	yes	0.42	UD..1204.R*
18U.6350.100	63	49.6	22	50	7	1.7	2.5	1.0	1.6°	yes	0.65	UD..10T3.R
18U.6350.070	63	46.5	22	50	6	2.0	2.5	1.3	2.0°	yes	0.62	UD..1204.R
18U.6650.100	66	52.6	27	50	7	1.7	2.5	1.0	1.5°	yes	0.65	UD..10T3.R
18U.6650.070	66	49.5	27	50	6	2.0	2.5	1.3	1.8°	yes	0.67	UD..1204.R
18U.8050.070	80	63.5	27	50	7	2.0	2.5	1.3	1.3°	yes	1.03	UD..1204.R
18U.8050.160	80	56.2	27	50	5	3.0	3.8	3.0	1.1°	yes	0.94	UD..1606.R
18U.1050.070	100	83.5	32	50	9	2.0	2.5	1.3	1.2°	yes	1.57	UD..1204.R
18U.1050.160	100	76.2	32	50	7	3.0	3.8	3.0	1.1°	yes	1.57	UD..1606.R
18U.1263.070	125	108.5	40	63	11	2.0	2.5	1.3	0.8°	yes	3.14	UD..1204.R
18U.1263.160	125	98.6	40	63	9	3.0	3.8	3.0	1.1°	yes	3.10	UD..1606.R
18U.1663.160**	160	136.2	40	63	10	3.0	3.8	3.0	0.8°	yes	5.73	UD..1606.R

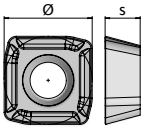
* Note that the screw length required varies depending on the insert used
** On request

INS SHAPE **UD**



UD

AS	Ø	s
2	06	02
	6.7	2.4



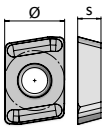
UD

AS	Ø				s			
4	08	10	12	16	03	T3	04	06
	8.4	10	12.7	16.5	3.2	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

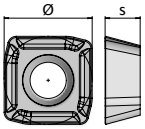
	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
UD.0602..	UD.0602.002.01 SKY77	UDGT 060215 SR-28	f_z	1.10	1.00	0.85	0.80	0.80	0.70	0.60
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.0602.002.01 AV1044	UDGT 060215 SR-28	f_z	–	–	0.85	0.80	0.80	0.70	0.60
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.0602.002.01 AV1055	UDGT 060215 SR-28	f_z	–	–	–	0.80	0.80	0.70	0.60
			v_c	–	–	–	190-240	170-200	140-180	90-130
UD.0803..	UD.0803.003.01 SKY77	UDGT 080321 SR-28	f_z	1.30	1.15	1.00	1.00	1.00	0.80	0.60
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.0803.003.01 AV1044	UDGT 080321 SR-28	f_z	–	–	1.00	1.00	1.00	0.80	0.60
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.0803.003.01 AV1055	UDGT 080321 SR-28	f_z	–	–	–	1.00	1.00	0.80	0.60
			v_c	–	–	–	190-240	170-200	140-180	90-130
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	1.40	1.30	1.20	1.20	1.20	0.90	0.65
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.10T3.002.01 AV1077	UDGT 10T325 SR-25	f_z	1.40	1.30	1.20	1.20	1.20	0.90	0.65
			v_c	290-340	260-300	220-250	190-230	150-210	130-170	80-120
	UD.10T3.002.02 AV1044	UDGT 10T325 SR-28	f_z	–	–	1.20	1.20	1.20	0.90	0.65
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.10T3.002.02 AV1055	UDGT 10T325 SR-28	f_z	–	–	–	1.20	1.20	0.90	0.65
			v_c	–	–	–	190-240	170-200	140-180	90-130
UD.1204..	UD.1204.002.01 SKY77	UDGT 120425 SR-25	f_z	1.70	1.50	1.40	1.40	1.40	1.00	0.70
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.1204.002.01 AV1077	UDGT 120425 SR-25	f_z	1.70	1.50	1.40	1.40	1.40	1.00	0.70
			v_c	290-340	260-300	220-250	190-230	150-210	130-170	80-120
	UD.1204.002.02 AV1044	UDGT 120425 SR-28	f_z	–	–	1.40	1.40	1.40	1.00	0.70
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.1204.002.02 AV1055	UDGT 120425 SR-28	f_z	–	–	–	1.40	1.40	1.00	0.70
			v_c	–	–	–	190-240	170-200	140-180	90-130
UD.1606..	UD.1606.002.01 SKY77	UDGT 160638 SR-25	f_z	2.00	1.80	1.60	1.60	1.60	1.20	0.80
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.1606.002.01 AV1077	UDGT 160638 SR-25	f_z	2.00	1.80	1.60	1.60	1.60	1.20	0.80
			v_c	290-340	260-300	220-250	190-230	150-210	130-170	80-120
	UD.1606.002.02 AV1044	UDGT 160638 SR-28	f_z	–	–	1.60	1.60	1.60	1.20	0.80
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.1606.002.02 AV1055	UDGT 160638 SR-28	f_z	–	–	–	1.60	1.60	1.20	0.80
			v_c	–	–	–	190-240	170-200	140-180	90-130

INS SHAPE **UD**



UD

AS	Ø	s
2	06	02
	6.7	2.4



UD

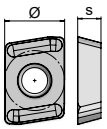
AS	Ø				s			
4	08	10	12	16	03	T3	04	06
	8.4	10	12.7	16.5	3.2	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
UD.0602..	UD.0602.002.01 SKY77	UDGT 060215 SR-28	f_z	1.20	1.10	0.95	0.80	0.60	0.60
			v_c	290-340	260-310	240-280	210-240	180-210	140-180
UD.0803..	UD.0803.003.01 SKY77	UDGT 080321 SR-28	f_z	1.40	1.20	1.00	1.00	0.80	0.70
			v_c	290-340	260-310	240-280	210-240	180-210	140-180
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	1.50	1.40	1.20	1.20	1.00	0.75
			v_c	290-340	260-310	240-280	210-240	180-210	140-180
UD.1204..	UD.1204.002.01 SKY77	UDGT 120425 SR-25	f_z	1.80	1.60	1.40	1.40	1.20	0.90
			v_c	290-340	260-310	240-280	210-240	180-210	140-180
UD.1606..	UD.1606.002.01 SKY77	UDGT 160638 SR-25	f_z	2.10	1.90	1.60	1.60	1.40	1.00
			v_c	290-340	260-310	240-280	210-240	180-210	140-180

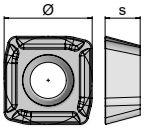
	Article	Designation		Stainless steels				Titanium		
				C12	C11	C10	C09	S10	S09	S08
UD.0602..	UD.0602.002.01 SKY77	UDGT 060215 SR-28	f_z	0.80	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.0602.002.01 AV1044	UDGT 060215 SR-28	f_z	0.80	0.75	0.70	–	–	–	–
			v_c	100-150	140-170	100-140	–	–	–	–
	UD.0602.002.01 AV1055	UDGT 060215 SR-28	f_z	0.80	0.75	0.70	0.50	0.70	0.50	0.45
			v_c	120-200	140-170	100-140	60-100	60-80	40-70	20-50
UD.0803..	UD.0803.003.01 SKY77	UDGT 080321 SR-28	f_z	0.80	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.0803.003.01 AV1044	UDGT 080321 SR-28	f_z	0.80	0.75	0.70	–	–	–	–
			v_c	100-170	100-170	100-140	–	–	–	–
	UD.0803.003.01 AV1055	UDGT 080321 SR-28	f_z	0.80	0.75	0.70	0.55	0.70	0.50	0.45
			v_c	120-200	100-170	100-140	60-100	60-80	40-70	20-50
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	0.90	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.10T3.002.01 AV1077	UDGT 10T325 SR-25	f_z	0.90	0.80	–	–	–	–	–
			v_c	100-150	100-150	–	–	–	–	–
	UD.10T3.002.02 AV1044	UDGT 10T325 SR-28	f_z	0.90	0.80	0.75	–	–	–	–
			v_c	100-170	100-170	100-140	–	–	–	–
	UD.10T3.002.02 AV1055	UDGT 10T325 SR-28	f_z	0.90	0.80	0.75	0.60	0.70	0.60	0.45
			v_c	100-200	100-170	100-140	60-100	60-80	40-70	20-50

INS SHAPE **UD**



UD

AS	Ø	s
2	06	02
	6.7	2.4



UD

AS	Ø				s			
4	08	10	12	16	03	T3	04	06
	8.4	10	12.7	16.5	3.2	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Stainless steels C12	C11	C10	C09	Titanium S10	S09	S08
UD.1204..	UD.1204.002.01 SKY77	UDGT 120425 SR-25	f_z	1.00	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.1204.002.01 AV1077	UDGT 120425 SR-25	f_z	1.00	0.85	0.75	–	–	–	–
			v_c	100-150	100-150	100-140	–	–	–	–
	UD.1204.002.02 AV1044	UDGT 120425 SR-28	f_z	1.00	0.85	0.75	–	–	–	–
			v_c	100-170	100-170	100-140	–	–	–	–
	UD.1204.002.02 AV1055	UDGT 120425 SR-28	f_z	1.00	0.85	0.75	0.60	0.70	0.60	0.45
			v_c	120-200	100-170	100-140	60-100	60-80	40-70	20-50
UD.1606..	UD.1606.002.01 SKY77	UDGT 160638 SR-25	f_z	1.20	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.1606.002.01 AV1077	UDGT 160638 SR-25	f_z	1.20	0.90	0.80	–	–	–	–
			v_c	100-150	100-150	100-140	–	–	–	–
	UD.1606.002.02 AV1044	UDGT 160638 SR-28	f_z	1.20	0.90	0.80	–	–	–	–
			v_c	100-170	100-170	100-140	–	–	–	–
	UD.1606.002.02 AV1055	UDGT 160638 SR-28	f_z	1.20	0.90	0.80	0.70	0.75	0.70	0.50
			v_c	120-200	100-170	100-140	60-100	60-80	40-70	20-50

INS		
UD..0602...*	08TP.2555.500	TP7I1
UD..0602...	08TP.2565.501	TP7I1
UD..0803...	08B.0307.7991	TX208
UD..10T3...	08B.3509.7991	TX215
UD..1204...*	08B.0409.7991	TX215
UD..1204...	08B.0411.7991	TX215
UD..1606...	08B.0513.7991	TX220

* Note that the screw length required varies depending on the insert used

Theoretical corner radius page 143
Technical information ramp page 144

CP90
CV90

EP90
EV90

HC90

LN90

CS90

Shoulder milling cutters with tangentially installed inserts are more break resistant and deliver outstanding cast iron machining results thanks to fine tooth pitches. The high feed and depth of cut in roughing are also achieved when machining materials such as stainless and titanium; the surface quality is excellent. Optimum stability for high precision and maximum Q. Also with DIN-type screw-in connection.

High positive stability
at 90°

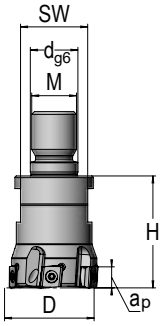
SHOULDER MILLING CUTTERS
SHANK END MILLS

SHOULDER MILLING CUTTERS
CP90 | CV90

NEWTOOL

The versions with Ø 25–40 mm are optimal for powerful milling on live tooling lathes and machining centers with rather low rigidity and drive power

DIN tool holders with standard adaptation shank and spindle connection for HSK, Capto and SK



CV90
Screw-in milling cutters

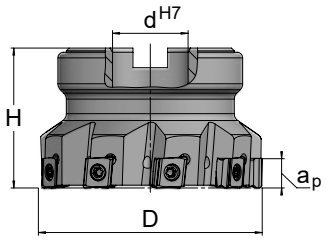
Article	D	d_{g6}	H	M	SW	z_{eff}	a_p	lc	kg	INS
04C.0232.001	25	12.5	32	12	17	4	7.5	yes	0.11	CN..07T3L
04C.0340.002	32	17	40	16	24	5	7.5	yes	0.22	CN..07T3L
04C.0440.001	40	17	40	16	24	7	7.5	yes	0.28	CN..07T3L

Tool holders/adapters page 120

SHOULDER MILLING CUTTERS
CP90 | CV90

NEWTOOL

Maximum break resistance through tangential mounting of the 4-cutting edge CN indexable insert
High combined feed per tooth and depths of cut
CV90: Fine tooth pitch is an advantage in cast iron machining processes



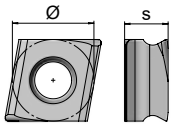
CP90
Plug-in milling cutters

Article	D	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
04C.0540.001	50	22	40	5	10.0	yes	0.35	CN..1005L
04C.0640.001	63	22	40	6	10.0	yes	0.54	CN..1005L
04C.0850.001	80	27	50	8	10.0	yes	1.10	CN..1005L
04C.1050.001	100	32	50	9	10.0	yes	1.77	CN..1005L
04C.1263.002	125	40	63	13	10.0	yes	3.30	CN..1005L

CV90
Plug-in milling cutters

Article	D	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
04C.0332.001	32	22	32	5	7.5	yes	0.12	CN..07T3L
04C.0432.004	40	16	32	7	7.5	yes	0.19	CN..07T3L
04C.0540.002	50	22	40	8	7.5	yes	0.36	CN..07T3L
04C.0640.002	63	22	40	7	10.0	yes	0.56	CN..1005L
04C.0850.002	80	27	50	9	10.0	yes	1.09	CN..1005L
04C.1050.002	100	32	50	12	10.0	yes	1.81	CN..1005L
04C.1263.001	125	40	63	16	10.0	yes	3.36	CN..1005L

INS SHAPE **CN**



CN

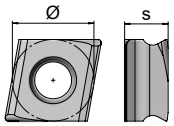
AS	Ø		s	
4	07	10	T3	05
	7.5	10.4	4	5.6

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.16	0.16	0.15	0.13	0.12	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	–	–	–	–	–	0.12	0.10
			v_c	–	–	–	–	–	110-140	80-110
CN..1005..	CN.1005.002.01 SKY77	CNHQ 100510 SL-25V	h_{max}	0.24	0.22	0.20	0.20	–	–	–
			v_c	280-320	240-280	210-240	180-210	–	–	–
	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	0.24	0.22	0.20	0.18	0.16	0.14	0.11
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	CN.1005.002.02 AV1077	CNHQ 100510 SL-28V	h_{max}	–	–	0.20	0.18	0.16	0.14	0.11
			v_c	–	–	210-240	180-210	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	290-320	260-295	230-270	210-240	180-210	140-180
	CN.07T3.008.11 NERO²77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
CN..1005..	CN.1005.002.01 SKY77	CNHQ 100510 SL-25V	h_{max}	0.28	0.26	0.22	0.20	0.17	0.15
			v_c	290-320	260-295	230-270	210-240	180-210	140-180
	CN.1005.002.01 CAN²77	CNHQ 100510 SL-25V	h_{max}	0.28	0.26	0.22	0.20	0.17	0.15
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	–	–	0.20	0.18	0.16	0.13
			v_c	–	–	230-270	210-240	180-210	140-180

INS SHAPE **CN**



CN

AS	Ø		s	
4	07	10	T3	05
	7.5	10.4	4	5.6

Matching of machining parameters with the AV material groups

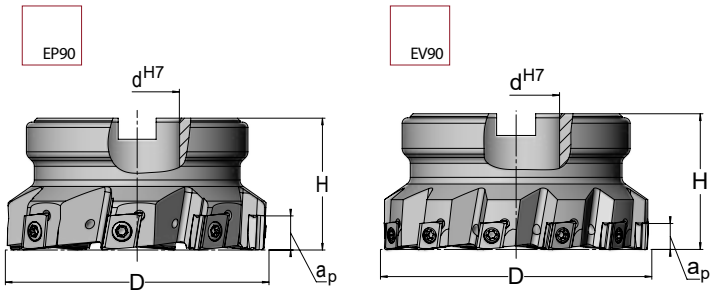
	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	–	–	0.20	0.21	0.16
			v_c	150-220	120-170	–	–	650-1000	450-650	280-450
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	0.08	0.08	–	–	–
			v_c	150-220	140-170	90-120	60-100	–	–	–
CN..1005..	CN.1005.002.02 SKY77	CNHQ 100510 SL-28V	h_{max}	–	–	–	–	0.25	0.25	0.20
			v_c	–	–	–	–	650-1000	450-650	280-450
	CN.1005.002.02 AV1077	CNHQ 100510 SL-28V	h_{max}	0.11	–	–	–	–	–	–
			v_c	150-220	–	–	–	–	–	–

INS		
CN..07T3...	08B.0309.7991	TX208
CN..1005...	08B.3511.7991	TX215

Mounting | CN/EN/FN indexable insert page 138

SHOULDER MILLING CUTTERS
EP90 | EV90

Maximum break resistance through tangential mounting of the 4-cutting edge EN indexable insert
High combined feed per tooth and depths of cut
EV90: Fine tooth pitch is an advantage in cast iron machining processes



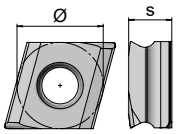
EP90
Plug-in milling cutters

Article	D	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
04E.0432.001	40	16	32	5	7.5	yes	0.18	EN..08T3.L
04E.0536.001	50	22	36	5	9.0	yes	0.31	EN..0904.L
04E.0640.005	63	22	40	5	12.0	yes	0.52	EN..1206.L
04E.0850.001	80	27	50	7	12.0	yes	1.06	EN..1206.L
04E.1050.001	100	32	50	8	12.0	yes	1.76	EN..1206.L
04E.1263.001	125	40	63	10	12.0	yes	3.13	EN..1206.L

EV90
Plug-in milling cutters

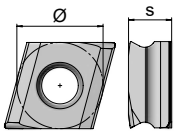
Article	D	d^{H7}	H	z_{eff}	a_p	lc	kg	INS
04E.0432.002	40	16	32	6	7.5	yes	0.20	EN..08T3.L
04E.0536.004	50	22	36	7	7.5	yes	0.32	EN..08T3.L
04E.0640.001	63	22	40	7	9.0	yes	0.54	EN..0904.L
04E.0640.006	63	22	40	9	7.5	yes	0.57	EN..08T3.L
04E.0850.004	80	27	50	10	9.0	yes	1.09	EN..0904.L
04E.0850.016	80	27	50	12	7.5	yes	1.12	EN..08T3.L
04E.1050.003	100	32	50	12	9.0	yes	1.77	EN..0904.L
04E.1050.004	100	32	50	12	12.0	yes	1.82	EN..1206.L
04E.1263.003	125	40	63	13	9.0	yes	3.16	EN..0904.L
04E.1263.007	125	40	63	15	12.0	yes	3.16	EN..1206.L

INS SHAPE **EN**



EN*

AS	Ø			s		
1	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35



EN

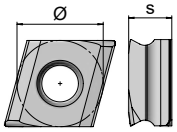
AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.13	0.12	0.11	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.13	0.12	0.11	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.001.54 SKY77	ENHQ 08T306 SL-30	h_{max}	–	–	–	0.11	0.10	0.08	0.08
			v_c	–	–	–	180-210	140-180	110-140	80-110
	EN.08T3.031.01 SKY77*	ENFQ 08T306 FL-33S*	h_{max}	0.15	0.15	0.13	0.12	0.11	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	–	–	–	0.12	0.11	0.10	0.08
			v_c	–	–	–	180-210	140-180	110-140	80-110
	EN.0904.033.02 SKY77*	ENFQ 090408 EL-33S*	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0.23	0.22	0.20	0.20	–	–	–
			v_c	280-320	240-280	210-240	180-210	–	–	–
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0.21	0.21	0.18	0.16	0.14	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.1206.003.52 SKY77	ENHQ 120610 SL-28	h_{max}	0.21	0.21	0.18	0.16	0.14	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.1206.003.54 SKY77	ENHQ 120610 SL-30	h_{max}	0.18	0.18	0.17	0.14	0.12	0.11	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EN.1206.035.01 SKY77*	ENFQ 120610 EL-33S*	h_{max}	0.21	0.21	0.18	0.16	0.14	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

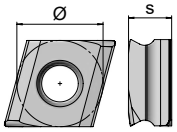
* Only one indexable wiper insert ENFQ required per tool. Only in combination with geometry -28W. The height changes.

INS SHAPE **EN**



EN*

AS	Ø			s		
1	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35



EN

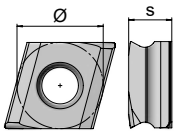
AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.08T3.012.09 NERO26	ENHQ 08T306 SL-28W	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.08T3.017.26 NERO26	ENHQ 08T306 SL-28V	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.08T3.031.01 SKY77*	ENFQ 08T306 FL-33S*	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.08T3.031.01 NERO26*	ENFQ 08T306 FL-33S*	h_{max}	0.15	0.14	0.13	0.12	0.10	0.08
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0.18	0.17	0.15	0.12	0.11	0.10
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.0904.023.12 NERO26	ENHQ 090408 SL-28W	h_{max}	0.18	0.17	0.15	0.12	0.11	0.10
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.15	0.12	0.11	0.10
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.0904.017.26 NERO26	ENHQ 090408 SL-28V	h_{max}	0.18	0.17	0.15	0.12	0.11	0.10
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.0904.033.02 SKY77*	ENFQ 090408 EL-33S*	h_{max}	0.18	0.17	0.15	0.12	0.11	0.10
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
EN..1206..	EN.1206.027.18 SKY77	ENHQ 120610 SL-25V	h_{max}	0.26	0.26	0.23	0.20	0.16	0.13
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.1206.027.18 NERO26	ENHQ 120610 SL-25V	h_{max}	0.26	0.26	0.23	0.20	0.16	0.13
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.1206.027.18 CAN^{2}77	ENHQ 120610 SL-25V	h_{max}	0.26	0.26	0.23	0.20	0.16	0.13
			v_c	320-380	280-340	240-280	210-240	180-210	140-180
	EN.1206.029.13 SKY77	ENHQ 120610 SL-28W	h_{max}	0.24	0.23	0.22	0.17	0.15	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.1206.029.13 NERO26	ENHQ 120610 SL-28W	h_{max}	0.24	0.23	0.22	0.17	0.15	0.12
			v_c	300-350	280-320	220-280	190-230	130-190	120-150
	EN.1206.003.52 SKY77	ENHQ 120610 SL-28	h_{max}	0.24	0.23	0.22	0.17	0.15	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	EN.1206.035.01 SKY77*	ENFQ 120610 EL-33S*	h_{max}	0.24	0.23	0.22	0.17	0.15	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150

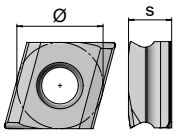
* Only one indexable wiper insert ENFQ required per tool. Only in combination with geometry -28W. The height changes.

INS SHAPE **EN**



EN*

AS	Ø			s		
1	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35



EN

AS	Ø			s		
4	08	09	12	T3	04	06
	8	9.52	12.7	3.97	4.76	6.35

Matching of machining parameters with the AV material groups

	Article	Designation		NF metals E82	NF metals E81	NF metals E80
EN..08T3..	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.20	0.18	0.15
			v_c	650-1000	450-650	280-450
	EN.08T3.001.54 SKY77	ENHQ 08T306 SL-30	h_{max}	0.17	0.15	0.12
			v_c	650-1000	450-650	280-450
	EN.08T3.031.01 SKY77*	ENFQ 08T306 FL-33S*	h_{max}	0.20	0.18	0.15
			v_c	650-1000	450-650	280-450
EN..0904..	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.22	0.20	0.16
			v_c	650-1000	450-650	280-450
	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	0.20	0.18	0.15
			v_c	650-1000	450-650	280-450
	EN.0904.033.02 SKY77*	ENFQ 090408 EL-33S*	h_{max}	0.22	0.20	0.16
			v_c	650-1000	450-650	280-450
EN..1206..	EN.1206.003.52 SKY77	ENHQ 120610 SL-28	h_{max}	0.28	0.25	0.20
			v_c	650-1000	450-650	280-450
	EN.1206.003.54 SKY77	ENHQ 120610 SL-30	h_{max}	0.26	0.24	0.18
			v_c	650-1000	450-650	280-450
	EN.1206.035.01 SKY77*	ENFQ 120610 EL-33S*	h_{max}	0.28	0.25	0.20
			v_c	650-1000	450-650	280-450

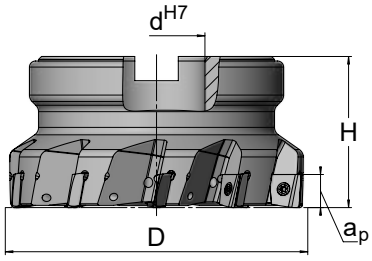
* Only one indexable wiper insert ENFQ required per tool. Only in combination with geometry -28W. The height changes.

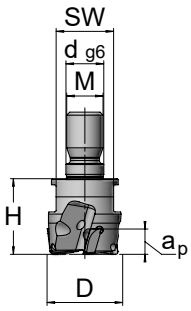
INS		
EN..08T3...	08B.0309.7991	TX208
EN..0904...	08B.3509.7991	TX215
EN..1206...	08B.0513.7991	TX220

Mounting | CN/EN/FN indexable insert page 138

SHOULDER MILLING CUTTERS
HC90

Highly compatible with materials that are difficult to machine, such as stainless and titanium
High feed per tooth and depths of cut in 90°-machining
The new screw-in versions with Ø 25–40 mm are optimal for powerful milling on live tooling lathes and machining centers with rather low rigidity and drive power





HC90
Screw-in milling cutters

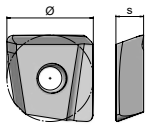
Article	D	d_{g6}	H	M	SW	z_{eff}	a_p	Ramp	lc	kg	INS
04M.0225.151	25	12.5	25	12	19	3	8.0	–	yes	0.10	MO..1003.R
04M.0325.151	32	17	25	16	27	4	8.0	–	yes	0.14	MO..1003.R
04M.0430.151	40	17	30	16	27	5	8.0	–	yes	0.22	MO..1003.R

HC90
Plug-in milling cutters

Article	D	d^{H7}	H	z_{eff}	a_p	Ramp	lc	kg	INS
04M.0432.150	40	16	32	5	8.0	1.0°	yes	0.16	MO..1003.R
04M.0540.150	50	22	40	6	8.0	0.8°	yes	0.32	MO..1003.R
04M.0540.080	50	22	40	6	10.0	1.1°	yes	0.32	MO..12T3.R
04M.0640.080	63	22	40	7	10.0	0.8°	yes	0.50	MO..12T3.R
04M.0850.080	80	27	50	9	10.0	0.6°	yes	1.03	MO..12T3.R
04M.1050.080	100	32	50	10	10.0	0.5°	yes	1.70	MO..12T3.R

Tool holders/adapters page 120

INS SHAPE **MO**



MO

AS	Ø		s	
2	10	12	03	T3
	10	12.7	4	3.6

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.18	0.16	0.15	0.13	0.12	0.11	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	MO.1003.031.04 AV1077	MOGU 100310 TR-28	h_{max}	–	–	–	–	0.12	0.11	0.08
			v_c	–	–	–	–	140-180	110-140	80-110
MO..12T3..	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	0.23	0.22	0.20	0.18	0.15	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	MO.12T3.081.01 AV1077	MOGU 12T310 TR-28	h_{max}	–	–	–	–	0.15	0.12	0.10
			v_c	–	–	–	–	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.20	0.18	0.16	0.14	0.12	0.10
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
MO..12T3..	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	0.25	0.23	0.20	0.18	0.15	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150

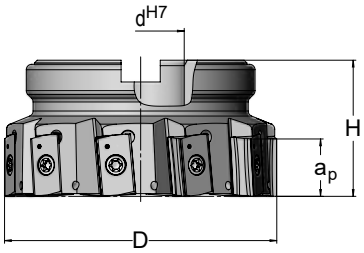
	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.10	0.10	–	–	0.25	0.21	0.17
			v_c	120-200	100-150	–	–	650-1000	450-650	280-450
	MO.1003.031.04 AV1077	MOGU 100310 TR-28	h_{max}	0.10	0.10	–	–	–	–	–
			v_c	120-220	100-170	–	–	–	–	–
MO..12T3..	MO.12T3.081.01 SKY77	MOGU 12T310 TR-28	h_{max}	0.13	0.11	–	–	0.28	0.23	0.18
			v_c	120-200	100-150	–	–	650-1000	450-650	280-450
	MO.12T3.081.01 AV1077	MOGU 12T310 TR-28	h_{max}	0.13	0.11	–	–	–	–	–
			v_c	120-220	100-170	–	–	–	–	–

INS		
MO..1003...	08B.0309.001	TX208
MO..12T3...	08B.0309.001	TX208

Technical information ramp page 144

SHOULDER MILLING CUTTERS
LN90

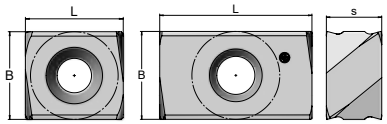
With insert sizes for extremely high depths of cut in 90° machining
Enormous stability due to sturdy cutting wedge
Achieves excellent roughing and finishing surface quality



LN90 Plug-in milling cutters								
Article	**D**	**d^{H7}**	**H**	**z_{eff}**	**a_p**	**Ic**	**kg**	**INS**
04L.0550.003	50	22	50	5	20.0	yes	0.52	LN..2208..L
04L.0540.030	50	22	40	6	10.0	yes	0.37	LN..1208..L*
04L.0650.005	63	22	50	6	20.0	yes	0.84	LN..2208..L
04L.0640.030	63	22	40	7	10.0	yes	0.57	LN..1208..L*
04L.0850.005	80	27	50	8	20.0	yes	1.33	LN..2208..L
04L.0850.030	80	27	50	10	10.0	yes	1.11	LN..1208..L
04L.1050.005	100	32	50	10	20.0	yes	2.05	LN..2208..L
04L.1050.030	100	32	50	12	10.0	yes	1.82	LN..1208..L
04L.1263.005	125	40	63	13	20.0	yes	3.54	LN..2208..L
04L.1263.030	125	40	63	15	10.0	yes	3.43	LN..1208..L
04L.1663.030	160	40	63	18	10.0	yes	4.55	LN..1208..L

* Note that the screw length required varies depending on the insert used

INS SHAPE **LN**



LN

AS	L		B	s
4	12	22	12,5	08
	11.2	22	12.5	8

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
LN..1208..	LN.1208.002.01 SKY77	LNHQ 120810 TL-28S	h_{max}	0.23	0.20	0.18	–	–	–	–
			v_c	280-320	220-280	180-230	–	–	–	–
LN..2208..	LN.2208.003.01 SKY77	LNHQ 220805 SL-28	h_{max}	0.23	0.20	0.18	–	–	–	–
			v_c	280-320	220-280	180-230	–	–	–	–

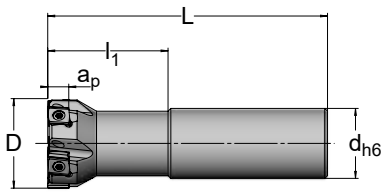
	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
LN..1208..	LN.1208.002.01 SKY77	LNHQ 120810 TL-28S	h_{max}	0.28	0.26	0.22	0.20	0.16	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	LN.1208.002.01 CAN²77	LNHQ 120810 TL-28S	h_{max}	0.28	0.26	0.22	0.20	0.16	0.12
			v_c	300-380	270-320	230-280	170-220	150-200	120-150
LN..2208..	LN.2208.003.01 SKY77	LNHQ 220805 SL-28	h_{max}	0.28	0.26	0.22	0.20	0.16	0.12
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
	LN.2208.003.01 CAN²77	LNHQ 220805 SL-28	h_{max}	0.28	0.26	0.22	0.20	0.16	0.12
			v_c	300-380	270-320	230-280	170-220	150-200	120-150

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

* Note that the screw length required varies depending on the insert used

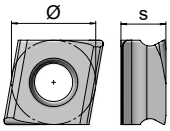
SHANK END MILLS
CS90

Maximum break resistance through tangential mounting of the 4-cutting edge CN indexable insert, even in small indexable inserts
High combined feed per tooth and depths of cut
Fine tooth pitch is an advantage in cast iron machining processes



CS90 Shank end mills									
Article	**D**	**d_{h6}**	**L**	**l_1**	**z_{eff}**	**a_p**	**lc**	**kg**	**INS**
11C.2509.001	25	25	90	31.5	4	7	yes	0.30	CN..07T3..L
11C.3210.001	32	25	100	43	5	7	yes	0.37	CN..07T3..L
11C.4011.001	40	32	110	48.5	6	7	yes	0.67	CN..07T3..L

INS SHAPE **CN**



CN

AS	Ø	s
4	07	T3
	7.5	4

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.16	0.16	0.15	0.13	0.12	0.12	0.10
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	–	–	–	–	–	0.12	0.10
			v_c	–	–	–	–	–	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	290-320	260-295	230-270	210-240	180-210	140-180
	CN.07T3.008.11 NERO²77	CNHQ 07T306 SL-28W	h_{max}	0.17	0.15	0.14	0.12	0.12	0.12
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
CN..07T3..	CN.07T3.008.11 SKY77	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	–	–	0.22	0.21	0.16
			v_c	150-220	120-170	–	–	650-1000	450-650	280-450
	CN.07T3.008.11 AV1055	CNHQ 07T306 SL-28W	h_{max}	0.11	0.10	0.08	0.08	–	–	–
			v_c	150-220	120-170	90-120	60-100	–	–	–

INS		
CN..07T...	08B.0309.7991	TX208

Mounting | CN/EN/FN indexable insert page 138

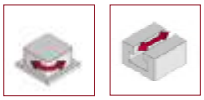
ET90 TZ18

For high performance T-slot milling with high feed rates and depths of cut. Also suitable for groove bottom machining in circular milling applications. Tangentially installed indexable inserts warrant optimum chip removal paired with high performance at all times.

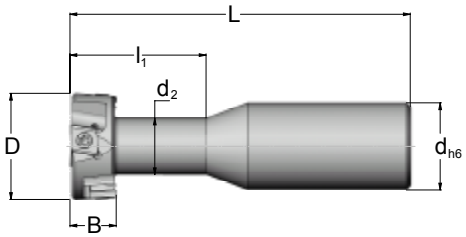
High Performance Standard

T-SLOT MILLING CUTTERS
CIRCULAR MILLING CUTTERS

T-SLOT MILLING CUTTERS
ET90



4-cutting edge EN indexable insert
High performance T-slot milling cutters, DIN 650-compliant
Excellent chip removal thanks to tangentially installed indexable insert

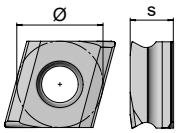


ET90
Shank end mills

Article	D	d_2	d_{h6}	L	l_1	B	zz	z_{eff}	lc	kg	INS
15E.3213.010	32	16.8	32	115	39	13	2 x 2	2	yes	0.51	EN..08T3.R/L
15E.4017.010	40	20.8	32	125	50	17	2 x 2	2	yes	0.65	EN..0904.R/L
15E.4821.010	48	26.0	32	135	60	21	2 x 3	2	yes	0.80	EN..08T3.R/L

Smaller diameters ETC90 page 104

INS SHAPE **EN**



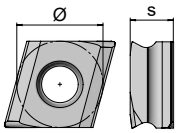
EN

AS	Ø		s	
4	08	09	T3	04
	8	9.52	3.97	4.76

Matching of machining parameters
with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.014.09 SKY77	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.016.26 SKY77	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.08T3.001.54 SKY77	ENHQ 08T306 SL-30	h_{max}	–	–	0.10	0.10	0.08	0.08	–
			v_c	–	–	210-240	180-210	140-180	110-140	–
	EN.08T3.002.54 SKY77	ENHQ 08T306 SR-30	h_{max}	–	–	0.10	0.10	0.08	0.08	–
			v_c	–	–	210-240	180-210	140-180	110-140	–
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.022.12 SKY77	ENHQ 090408 SR-28W	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.016.26 SKY77	ENHQ 090408 SR-28V	h_{max}	0.18	0.18	0.15	0.15	0.12	0.12	0.10
			v_c	240-280	240-280	210-240	180-210	140-180	110-140	80-110
	EN.0904.003.54 SKY77	ENHQ 090408 SL-30	h_{max}	–	–	0.12	0.12	0.10	0.10	–
			v_c	–	–	210-240	180-210	140-180	110-140	–
	EN.0904.002.54 SKY77	ENHQ 090408 SR-30	h_{max}	–	–	0.12	0.12	0.10	0.10	–
			v_c	–	–	210-240	180-210	140-180	110-140	–

INS SHAPE **EN**



EN

AS	Ø		s	
4	08	09	T3	04
	8	9.52	3.97	4.76

Matching of machining parameters
with the AV material groups

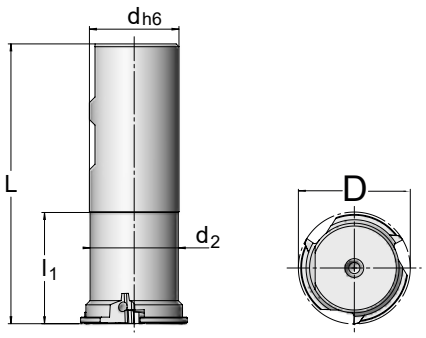
	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
EN..08T3..	EN.08T3.012.09 SKY77	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.08T3.012.09 NERO26	ENHQ 08T306 SL-28W	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.08T3.014.09 SKY77	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.08T3.014.09 NERO26	ENHQ 08T306 SR-28W	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.08T3.017.26 SKY77	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.08T3.017.26 NERO26	ENHQ 08T306 SL-28V	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.08T3.016.26 SKY77	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.08T3.016.26 NERO26	ENHQ 08T306 SR-28V	h_{max}	0.15	0.15	0.13	0.12	0.10	0.08
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
EN..0904..	EN.0904.023.12 SKY77	ENHQ 090408 SL-28W	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.0904.023.12 NERO26	ENHQ 090408 SL-28W	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.0904.022.12 SKY77	ENHQ 090408 SR-28W	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.0904.022.12 NERO26	ENHQ 090408 SR-28W	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.0904.017.26 SKY77	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.0904.017.26 NERO26	ENHQ 090408 SL-28V	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	280-340	240-280	220-250	200-240	180-210	140-180
	EN.0904.016.26 SKY77	ENHQ 090408 SR-28V	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	240-280	240-280	210-240	210-240	180-210	140-180
	EN.0904.016.26 NERO26	ENHQ 090408 SR-28V	h_{max}	0.18	0.18	0.15	0.14	0.12	0.10
			v_c	280-340	240-280	220-250	200-240	180-210	140-180

INS		
EN..08T3...	08B.0309.7991	TX208
EN..0904...	08B.3509.7991	TX215

Mounting | CN/EN/FN indexable insert page 138

CIRCULAR MILLING CUTTERS
TZ18

- Standard for all circlip grooves
- Three-side embedding of the circular indexable insert
- Ideal for groove bottom machining

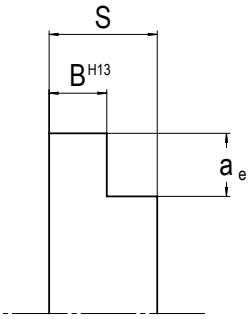


TZ18
Shank end mills

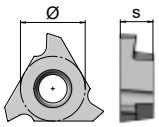
Article	D	d_2	d_{h6}	L	l_1	z_{eff}	a_e	lc	kg	INS
13T.2510.001	25	20.5	25	100	40	3	1.4 - 2.2	yes	0.31	TC..1103.R
13T.4011.001	40	31.5	32	100	39	3	2.2 - 3.2	yes	0.61	TN..1604.R

Data
INS

Article	D	s	B^{H13}	a_e
TC.1103.030.06 SKY77	6.35	3.20	1.60	1.40
TC.1103.030.05 SKY77	6.35	3.20	1.85	1.70
TC.1103.030.04 SKY77	6.35	3.20	2.15	2.00
TC.1103.030.03 SKY77	6.35	3.20	2.65	2.20
TN.1604.018.01 SKY77	9.52	4.76	2.65	2.20
TN.1604.018.02 SKY77	9.52	4.76	3.15	2.20
TN.1604.018.03 SKY77	9.52	4.76	4.15	3.20



INS SHAPE **TC | TN**



TC | TN

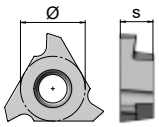
AS	Ø		s	
3	11	16	03	04
	6.35	9.52	3.2	4.76

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
TC..1103..	TC.1103.030.06 SKY77	TCAX 110316 TR-25	h_{max}	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.030.05 SKY77	TCAX 110318 TR-25	h_{max}	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.030.04 SKY77	TCAX 110321 TR-25	h_{max}	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TC.1103.030.03 SKY77	TCAX 110326 TR-25	h_{max}	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
TN..1604..	TN.1604.018.01 SKY77	TNAX 160426 TR-25	h_{max}	0.15	0.12	0.10	0.09	0.08	0.07	0.06
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1604.018.02 SKY77	TNAX 160432 TR-25	h_{max}	0.15	0.12	0.10	0.09	0.08	0.07	0.06
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	TN.1604.018.03 SKY77	TNAX 160441 TR-25	h_{max}	0.15	0.12	0.10	0.09	0.08	0.07	0.06
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
TC..1103..	TC.1103.030.06 SKY77	TCAX 110316 TR-25	h_{max}	0.13	0.10	0.08	0.08	0.06	0.06
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TC.1103.030.05 SKY77	TCAX 110318 TR-25	h_{max}	0.13	0.10	0.08	0.08	0.06	0.06
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TC.1103.030.04 SKY77	TCAX 110321 TR-25	h_{max}	0.13	0.10	0.08	0.08	0.06	0.06
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TC.1103.030.03 SKY77	TCAX 110326 TR-25	h_{max}	0.13	0.10	0.08	0.08	0.06	0.06
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
TN..1604..	TN.1604.018.01 SKY77	TNAX 160426 TR-25	h_{max}	0.15	0.12	0.10	0.10	0.08	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1604.018.02 SKY77	TNAX 160432 TR-25	h_{max}	0.15	0.12	0.10	0.10	0.08	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	TN.1604.018.03 SKY77	TNAX 160441 TR-25	h_{max}	0.15	0.12	0.10	0.10	0.08	0.08
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

INS SHAPE **TC | TN**



TC | TN

AS	Ø		s	
3	11	16	03	04
	6.35	9.52	3.2	4.76

Matching of machining parameters with the AV material groups

				NF metals		
	Article	Designation		E82	E81	E80
TC..1103..	TC.1103.030.06 SKY77	TCAX 110316 TR-25	h_{max}	0.15	0.12	0.10
			v_c	650-1000	450-650	280-450
	TC.1103.030.05 SKY77	TCAX 110318 TR-25	h_{max}	0.15	0.12	0.10
			v_c	650-1000	450-650	280-450
	TC.1103.030.04 SKY77	TCAX 110321 TR-25	h_{max}	0.15	0.12	0.10
			v_c	650-1000	450-650	280-450
	TC.1103.030.03 SKY77	TCAX 110326 TR-25	h_{max}	0.15	0.12	0.10
			v_c	650-1000	450-650	280-450
TN..1604..	TN.1604.018.01 SKY77	TNAX 160426 TR-25	h_{max}	0.18	0.15	0.11
			v_c	650-1000	450-650	280-450
	TN.1604.018.02 SKY77	TNAX 160432 TR-25	h_{max}	0.18	0.15	0.11
			v_c	650-1000	450-650	280-450
	TN.1604.018.03 SKY77	TNAX 160441 TR-25	h_{max}	0.18	0.15	0.11
			v_c	650-1000	450-650	280-450

INS		
TC..1103...	08B.2506.7991	TX208
TN..1604...	08B.0375.7991	TX208

Mounting | TC/TN indexable insert page 137

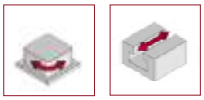
ETC90 | SP18 | TS90 | XS90 | TRILOC

The Avant Easy Change interchangeable heads fit concisely and are variable in diameter and number of teeth. The alternative to carbide shank end mills when the depths of cut are small. The Avant Easy Change program is a proven solution – geared for maximum Q.

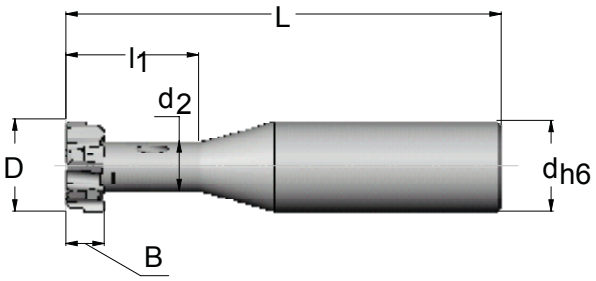
Fast, concisely
fitting changes

PROGRAMS
AVANT EASY CHANGE | TRILOC

T-SLOT MILLING CUTTERS
ETC90



T-slot milling cutters with highly precise indexable insert system
Optimal power transmission through cross and/or star drive keys
Extreme stability for long tool lives



ETC90
Smooth shank tool holders

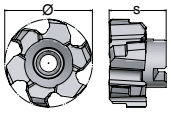
Article	D	d_2	d_{h6}	L	l_1	lc	kg	INS
20G.20.1112.01	20	11	20	96	30	yes	0.18	ECT2008.R
20G.20.1313.01	24	13	20	100	35	yes	0.20	ECT2410.R
20G.25.1713.01	31	17	25	105	40	yes	0.37	ECT3113.R

Bigger diameters ET90 page 94

Data
Interchangeable heads ECT

Article	D	z_{eff}	B	Weight in g
EC.T2008.32.01 SKY77	20	3	8.5	25.1
EC.T2410.33.01 SKY77	24	3	10	41.2
EC.T3113.33.01 SKY77	31	3	13	98.4

INTERCHANGEABLE HEADS **EC**



ECT

AS	Ø			s		
3	20	24	31	08	10	13
	20	24	31	13	15	18

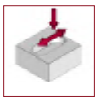
Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
ECT2008…	EC.T2008.32.01 SKY77	ECT 200808 TR-25	h_{max}	0.11	0.1	0.1	0.08	0.05	–	–
			v_c	180-210	180-210	160-190	150-180	120-160	–	–
ECT2410…	EC.T2410.33.01 SKY77	ECT 241010 TR-25	h_{max}	0.11	0.1	0.1	0.08	0.05	–	–
			v_c	180-210	180-210	160-190	150-180	120-160	–	–
ECT3113…	EC.T3113.33.01 SKY77	ECT 311312 TR-25	h_{max}	0.11	0.1	0.1	0.08	0.05	–	–
			v_c	180-210	180-210	160-190	150-180	120-160	–	–

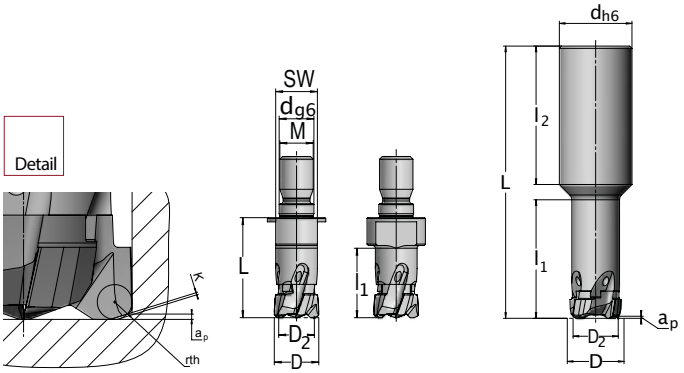
	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
ECT2008…	EC.T2008.32.01 SKY77	ECT 200808 TR-25	h_{max}	0.1	0.08	0.07	0.05	–	–
			v_c	180-240	170-230	150-200	140-170	–	–
ECT2410…	EC.T2410.33.01 SKY77	ECT 241010 TR-25	h_{max}	0.1	0.08	0.07	0.05	–	–
			v_c	180-240	170-230	150-200	140-170	–	–
ECT3113…	EC.T3113.33.01 SKY77	ECT 311312 TR-25	h_{max}	0.1	0.08	0.07	0.05	–	–
			v_c	180-240	170-230	150-200	140-170	–	–

INS		
ECT2008...	08B.3514.7991	TX215
ECT2410...	08B.0520.7991	TX220
ECT3113...	08B.0520.7991	TX220

HIGH FEED MILLING CUTTERS
SP18



High feed milling cutter with high precision interchangeable carbide head system
Optimal power transmission through cross or star drive keys
Extreme stability for a long tool life



SP18
Smooth shank tool holders

Article	D	d_{h6}	L	l_1	l_2	Ic	kg	INS
20G.20.1412.01	16	20	80	27	50	yes	0.15	ECK1612.R
20G.20.1422.01	16	20	95	42	50	yes	0.17	ECK1612.R
20G.20.1432.01	16	20	120	67	50	yes	0.20	ECK1612.R
20G.20.1723.01	20	20	100	48	50	yes	0.26	ECK2012.R
20G.32.2125.01	25	32	120	52	61	yes	0.53	ECK2512.R
20G.32.2135.01	25	32	150	82	61	yes	0.61	ECK2512.R

SP18
Screw-in tool holders

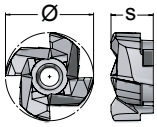
Article	D	d_{g6}	L	l_1	M	SW	Ic	kg	INS
20K.12.1412.01	16	12.5	36	25	12	15	yes	0.15	ECK1612.R
20K.16.2115.01	25	17	40	29	16	24	yes	0.16	ECK2512.R

Data
Interchangeable heads ECK

Article	D	D_2	z_{eff}	a_p	rth	K	Ramp	Weight in g
EC.K1612.42.02 SKY77	16	12.8	4	0.8	2.0	0.26	3.8°	15.0
EC.K2012.53.01 SKY77	20	13.5	5	0.75	2.5	0.29	3.1°	26.0
EC.K2512.45.01 SKY77	25	19.9	4	0.8	2.0	0.26	2.3°	35.7
EC.K2512.65.01 SKY77	25	17.9	6	0.8	2.5	0.41	2.3°	38.5

Tool holders/adapters page 120

INTERCHANGEABLE HEADS **EC**



ECK			
AS	Ø		s
4	16	25	12
	16	25	12

ECK		
AS	Ø	s
5	20	12
	20	12

ECK		
AS	Ø	s
6	25	12
	25	12

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
ECK1612..	EC.K1612.42.02 SKY77	ECK 161210 TR-25	h_{max}	0.8	0.8	0.65	0.6	0.55	0.5	0.45
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
ECK2012…	EC.K2012.53.01 SKY77	ECK 201210 TR-28	h_{max}	0.7	0.7	0.6	0.55	0.5	0.45	0.4
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
ECK2512…	EC.K2512.45.01 SKY77	ECK 251210 TR-25	h_{max}	1.0	0.85	0.85	0.8	0.75	0.7	0.55
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	EC.K2512.65.01 SKY77	ECK 251210 TR-28	h_{max}	0.65	0.65	0.55	0.5	0.45	0.4	0.35
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

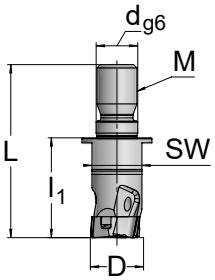
	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
ECK1612..	EC.K1612.42.02 SKY77	ECK 161210 TR-25	h_{max}	0.8	0.8	0.7	0.6	0.5	0.45
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
ECK2012…	EC.K2012.53.01 SKY77	ECK 201210 TR-28	h_{max}	0.75	0.75	0.65	0.55	0.55	0.5
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
ECK2512…	EC.K2512.45.01 SKY77	ECK 251210 TR-25	h_{max}	1.0	1.0	0.85	0.85	0.75	0.7
			v_c	340-380	280-340	240-280	210-240	180-210	140-180
	EC.K2512.65.01 SKY77	ECK 251210 TR-28	h_{max}	0.75	0.75	0.65	0.55	0.55	0.5
			v_c	340-380	280-340	240-280	210-240	180-210	140-180

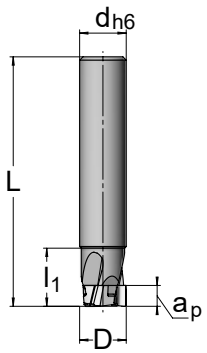
INS		
ECK1612...	08B.3512.7991	TX215
ECK2012...	08B.0516.7991	TX220
ECK2512...	08B.0520.7991	TX220

Theoretical corner radius page 143
Technical information ramp page 144

SHOULDER MILLING CUTTERS
TS90

- Alternative to carbide shank end milling cutters
- in combination with small depths of cut
- Utmost change accuracy
- Form and force locking cross and/or star drive keys
- Ensures maximum smooth cutting





TS90
Smooth shank tool holders

Article	D	d_{h6}	L	l_1	Ic	kg	INS
20G.14.1412.01	14	14	75	18	no	0.10	ECE1406.R
20G.14.1432.01	14	14	93.1	36	yes	0.10	ECE1406.R
20G.16.1612.01	16	16	82	22	no	0.12	ECE1606.R
20G.16.1632.01	16	16	104.1	44	yes	0.14	ECE1606.R
20G.18.1813.01	18	18	84	23	yes	0.15	ECE1808.R
20G.18.1833.01	18	18	108	47	yes	0.20	ECE1808.R
20G.20.2013.01	20	20	92	26	yes	0.20	ECE2008.R
20G.20.2033.01	20	20	118	52	yes	0.26	ECE2008.R

TS90
Screw-in tool holders

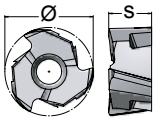
Article	D	d_{g6}	L	l_1	M	SW	Ic	kg	INS
20K.12.1312.01	14	12.5	30	19	12	15	yes	0.10	ECE1406.R
20K.12.1512.01	16	12.5	30	19	12	15	yes	0.12	ECE1606.R
20K.12.1713.01	18	12.5	30	21	12	15	yes	0.15	ECE1808.R
20K.12.1913.02	20	12.5	30	21	12	17	yes	0.20	ECE2008.R

Data
Interchangeable heads ECE

Article	D	z_{eff}	a_p	Weight in g
EC.E1406.32.01 SKY77	14	3	6.0	5.9
EC.E1606.32.01 SKY77	16	3	6.0	7.9
EC.E1808.33.01 SKY77	18	3	8.0	10.9
EC.E2008.33.01 SKY77	20	3	8.0	13.6

Tool holders/adapters page 120

INTERCHANGEABLE HEADS **EC**



ECE

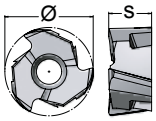
AS	Ø				s	
3	14	16	18	20	06	08
	14	16	18	20	6	8

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
ECE1406..	EC.E1406.32.01 SKY77	ECE 140606 TR-25	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
ECE1606..	EC.E1606.32.01 SKY77	ECE 160608 TR-25	h_{max}	0.15	0.15	0.12	0.12	0.10	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
ECE1808..	EC.E1808.33.01 SKY77	ECE 180808 TR-25	h_{max}	0.20	0.17	0.14	0.12	0.10	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
ECE2008..	EC.E2008.33.01 SKY77	ECE 200810 TR-25	h_{max}	0.20	0.17	0.14	0.12	0.10	0.10	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110

	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
ECE1406..	EC.E1406.32.01 SKY77	ECE 140606 TR-25	h_{max}	0.18	0.15	0.12	0.12	0.10	0.08
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE1606..	EC.E1606.32.01 SKY77	ECE 160608 TR-25	h_{max}	0.18	0.15	0.12	0.12	0.10	0.08
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE1808..	EC.E1808.33.01 SKY77	ECE 180808 TR-25	h_{max}	0.18	0.15	0.12	0.12	0.10	0.08
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE2008..	EC.E2008.33.01 SKY77	ECE 200810 TR-25	h_{max}	0.18	0.15	0.12	0.12	0.10	0.08
			v_c	290-340	270-300	240-280	210-240	180-210	140-180

INTERCHANGEABLE HEADS **EC**



ECE

AS	Ø				s	
3	14	16	18	20	06	08
	14	16	18	20	6	8

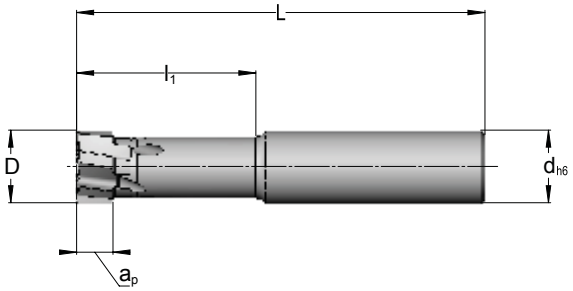
Matching of machining parameters
with the AV material groups

	Article	Designation		Stainless steels				NF metals		
				C12	C11	C10	C09	E82	E81	E80
ECE1406..	EC.E1406.32.01 SKY77	ECE 140606 TR-25	h_{max}	0.12	0.10	–	–	0.22	0.18	0.15
			v_c	120-200	100-160	–	–	650-1000	450-650	280-450
ECE1606..	EC.E1606.32.01 SKY77	ECE 160608 TR-25	h_{max}	0.12	0.10	–	–	0.22	0.18	0.15
			v_c	120-200	100-160	–	–	650-1000	450-650	280-450
ECE1808..	EC.E1808.33.01 SKY77	ECE 180808 TR-25	h_{max}	0.12	0.10	–	–	0.22	0.18	0.15
			v_c	120-200	100-160	–	–	650-1000	450-650	280-450
ECE2008..	EC.E2008.33.01 SKY77	ECE 200810 TR-25	h_{max}	0.12	0.10	–	–	0.22	0.18	0.15
			v_c	120-200	100-160	–	–	650-1000	450-650	280-450

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

SHOULDER MILLING CUTTERS
XS90

Alternative to carbide shank end milling cutters
in combination with small depths of cut
Utmost change accuracy
Form and force locking cross and/or star drive keys
Ensures maximum smooth cutting



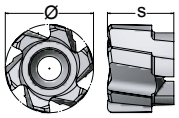
XS90
Smooth shank tool holders

Article	D	d_{h6}	L	l_1	lc	kg	INS
20G.16.1327.10	16	16	90	40	yes	0.12	ECE1612.R
20G.20.1624.10	20	20	100	48	yes	0.24	ECE2014.R
20G.25.2013.01	25	25	120	30	yes	0.42	ECE2512.R
20G.25.2033.01	25	25	130	71	yes	0.39	ECE2512.R
20G.25.2126.10	25	25	110	53	yes	0.36	ECE2516.R
20G.32.2526.10	28	32	120	58	yes	0.62	ECE2818.R

Data
Interchangeable heads ECE

Article	D	z_{eff}	a_p	Weight in g
EC.E1612.67.10 SKY77	16	6	8.0	33.0
EC.E2014.84.10 SKY77	20	8	10.0	33.0
EC.E2512.53.02 SKY77	25	5	8.5	40.8
EC.E2516.86.10 SKY77	25	8	12.5	63.6
EC.E2818.86.10 SKY77	28	8	15.0	100.0

INTERCHANGEABLE HEADS **EC**



ECE		
AS	Ø	s
5	25	16
	25	16

ECE		
AS	Ø	s
6	16	12
	16	12

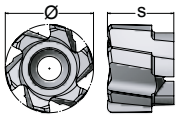
ECE						
AS	Ø			s		
8	20	25	28	14	16	18
	20	25	28	14	16	18.5

Matching of machining parameters with the AV material groups

	Article	Designation	Recomm. a_e 0.7 x D	Steel						
				A22	A21	A20	A19	A18	A17	A16
ECE1612…	EC.E1612.67.10 SKY77	ECE 161210 TR-28	h_{max}	0.16	0.16	0.14	0.14	0.12	0.10	–
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	–
ECE2014…	EC.E2014.84.10 SKY77	ECE 201410 TR-28	h_{max}	0.18	0.16	0.14	0.14	0.12	0.10	–
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	–
ECE2512…	EC.E2512.53.02 SKY77	ECE 251210 TR-25	h_{max}	0.20	0.18	0.15	0.15	0.13	0.11	–
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	–
ECE2516…	EC.E2516.86.10 SKY77	ECE 251610 TR-28	h_{max}	0.18	0.16	0.14	0.14	0.12	0.10	–
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	–
ECE2818…	EC.E2818.86.10 SKY77	ECE 281810 TR-28	h_{max}	0.18	0.16	0.14	0.14	0.12	0.10	–
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	–

	Article	Designation	Recomm. a_e 0.7 x D	Cast iron					
				D21	D20	D19	D18	D17	D16
ECE1612…	EC.E1612.67.10 SKY77	ECE 161210 TR-28	h_{max}	0.16	0.15	0.14	0.14	0.10	0.10
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE2014…	EC.E2014.84.10 SKY77	ECE 201410 TR-28	h_{max}	0.16	0.15	0.14	0.14	0.10	0.10
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE2512…	EC.E2512.53.02 SKY77	ECE 251210 TR-25	h_{max}	0.18	0.16	0.15	0.15	0.11	0.10
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE2516…	EC.E2516.86.10 SKY77	ECE 251610 TR-28	h_{max}	0.16	0.15	0.14	0.14	0.10	0.10
			v_c	290-340	270-300	240-280	210-240	180-210	140-180
ECE2818…	EC.E2818.86.10 SKY77	ECE 281810 TR-28	h_{max}	0.16	0.15	0.14	0.14	0.10	0.10
			v_c	290-340	270-300	240-280	210-240	180-210	140-180

INTERCHANGEABLE HEADS **EC**



ECE		
AS	Ø	s
5	25	16
	25	16

ECE		
AS	Ø	s
6	16	12
	16	12

ECE						
AS	Ø			s		
8	20	25	28	14	16	18
	20	25	28	14	16	18.5

Matching of machining parameters with the AV material groups

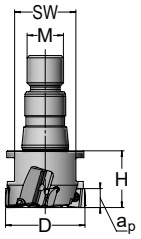
	Article	Designation	Recomm. a_e 0.7 x D	NF metals		
				E82	E81	E80
ECE1612…	EC.E1612.67.10 SKY77	ECE 161210 TR-28	h_{max}	0.15	0.15	–
			v_c	650-1000	450-650	–
ECE2014…	EC.E2014.84.10 SKY77	ECE 201410 TR-28	h_{max}	0.15	0.15	–
			v_c	650-1000	450-650	–
ECE2512…	EC.E2512.53.02 SKY77	ECE 251210 TR-25	h_{max}	0.15	0.15	–
			v_c	650-1000	450-650	–
ECE2516…	EC.E2516.86.10 SKY77	ECE 251610 TR-28	h_{max}	0.15	0.15	–
			v_c	650-1000	450-650	–
ECE2818…	EC.E2818.86.10 SKY77	ECE 281810 TR-28	h_{max}	0.15	0.15	–
			v_c	650-1000	450-650	–

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

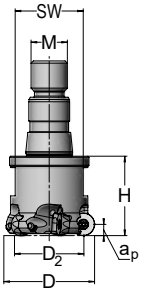
TRILOC **HC90 | RO18**

Shoulder milling cutters HC90 and copy milling cutters RO18 as TRILOC variant – particularly stable connection for long overhangs
Extremely high radial run out precision
Extremely precise change accuracy
Also available with vibration dampening

HC90



RO18



HC90 TRILOC
Shoulder milling cutters

Article	D	H	M	SW	z_{eff}	a_p	lc	kg	INS
04M.0225.150	28	25	12	19	3	8.0	yes	0.10	MO..1003.R
04M.0325.150	35	25	16	27	4	8.0	yes	0.22	MO..1003.R

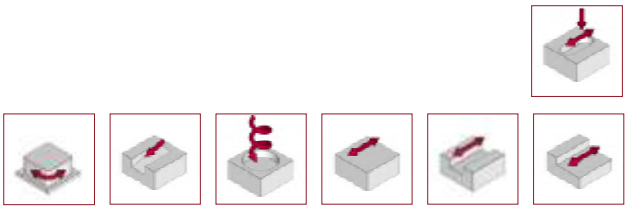
RO18 TRILOC
Copy milling cutters

Article	D	D_2	H	M	SW	z_{eff}	a_p	Ramp	lc	kg	INS
18R.2520.011	25	15	20	12	19	3	5.0	5°	yes	0.07	RD..10T3.N
18R.3230.011	32	22	30	16	24	4	5.0	4°	yes	0.19	RD..10T3.N
18R.3535.011	35	25	35	16	27	4	5.0	3°	yes	0.26	RD..10T3.N
18R.4035.011	40	30	35	16	30	5	5.0	3°	yes	0.29	RD..10T3.N

RO18 | Adaptation of f_z at different a_p values

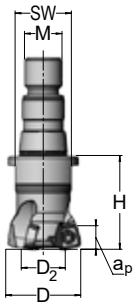
INS	a_p	0.5	1	1.5	2	2.5	3	3.5	4	5
RD..10T3...	f_z	2.00	1.50	1.25	1.10	1.00	0.95	0.90	0.85	0.90

TRILOC **UD90**

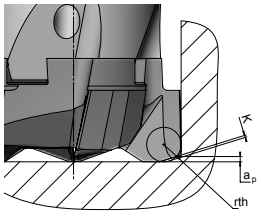


High feed milling cutters UD90 as TRILOC variant – particularly stable connection for long overhangs
Extremely high radial run out precision
Extremely precise change accuracy
Also available with vibration dampening

UD90



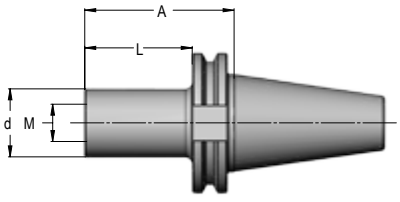
Detail



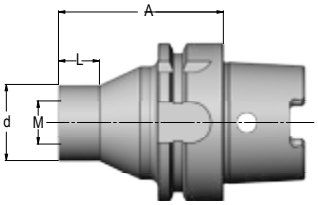
UD90 TRILOC
High feed milling cutters

Article	D	D_2	H	M	SW	z_{eff}	a_p	rth	K	Ramp	Ic	kg	INS
18U.3240.105	32	18.6	40	16	24	3	1.7	2.5	1.0	3.5°	yes	0.19	UD..10T3.R
18U.4040.105	40	26.6	40	16	30	4	1.7	2.5	1.0	2.5°	yes	0.27	UD..10T3.R

SK50



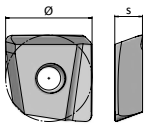
HSK63



Tool holders SK and HSK
for TRILOC HC90 | RO18 | UD90

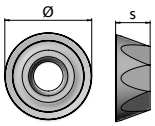
Tool holder	Article	d	L	M	A	kg
SK50	09C.5018.160	30	90	16	120	3.13
HSK63	09C.6314.125	30	95	12	130	1.20
	09C.6318.160	30	89	16	125	1.13
	09C.6318.165	30	114	16	150	1.26

INS SHAPE **MO | RD | UD**



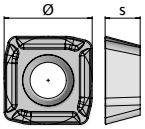
MO

AS	Ø	s
2	10	03
	10	3.6



RD

AS	Ø	s
8	10	T3
	10	3.97



UD

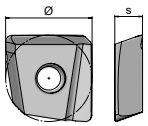
AS	Ø	s
4	10	T3
	10	3.97

Matching of machining parameters with the AV material groups

	Article	Designation		Steel						
				A22	A21	A20	A19	A18	A17	A16
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.18	0.16	0.15	0.13	0.12	0.11	0.08
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	MO.1003.031.04 AV1077	MOGU 100310 TR-28	h_{max}	–	–	–	–	0.12	0.11	0.08
			v_c	–	–	–	–	140-180	110-140	80-110
RD..10T3..	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30	f_z	–	–	–	–	–	0.30	0.25
			v_c	–	–	–	–	–	120-155	100-130
	RD.10T3.031.02 AV1055	RDKT 10T3M0 SN-28	f_z	0.65	0.60	0.55	0.50	0.45	0.35	0.25
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
	RD.10T3.031.01 SKY77	RDKT 10T3M0 SN-25	f_z	0.65	0.60	0.55	0.50	0.45	0.35	0.25
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	80-110
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	1.40	1.30	1.20	1.20	1.20	0.90	0.65
			v_c	280-320	240-280	210-240	180-210	140-180	110-140	70-110
	UD.10T3.002.01 AV1077	UDGT 10T325 SR-25	f_z	1.40	1.30	1.20	1.20	1.20	0.90	0.65
			v_c	290-340	260-300	220-250	190-230	150-210	130-170	80-120
	UD.10T3.002.02 AV1044	UDGT 10T325 SR-28	f_z	–	–	1.20	1.20	1.20	0.90	0.65
			v_c	–	–	230-290	190-240	170-200	140-180	90-130
	UD.10T3.002.02 AV1055	UDGT 10T325 SR-28	f_z	–	–	–	1.20	1.20	0.90	0.65
			v_c	–	–	–	190-240	170-200	140-180	90-130

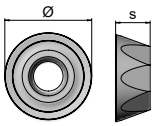
	Article	Designation		Cast iron					
				D21	D20	D19	D18	D17	D16
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.20	0.18	0.16	0.14	0.12	0.10
			v_c	240-280	200-240	170-200	150-190	120-160	120-150
RD..10T3..	RD.10T3.031.02 AV1055	RDKT 10T3M0 SN-28	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
	RD.10T3.031.01 SKY77	RDKT 10T3M0 SN-25	f_z	0.50	0.45	0.40	0.40	0.35	0.25
			v_c	280-310	260-290	230-270	210-240	180-210	140-180
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	1.50	1.40	1.20	1.20	1.00	0.75
			v_c	290-340	260-310	240-280	210-240	180-210	140-180

INS SHAPE **MO | RD | UD**



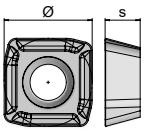
MO

AS	Ø	s
2	10	03
	10	3.6



RD

AS	Ø	s
8	10	T3
	10	3.97



UD

AS	Ø	s
4	10	T3
	10	3.97

Matching of machining parameters with the AV material groups

	Article	Designation		Stainless steels C12	Stainless steels C11	Stainless steels C10	Stainless steels C09	NF metals E82	NF metals E81	NF metals E80
MO..1003..	MO.1003.031.04 SKY77	MOGU 100310 TR-28	h_{max}	0.10	0.10	–	–	0.25	0.21	0.17
			v_c	120-200	100-150	–	–	650-1000	450-650	280-450
	MO.1003.031.04 AV1077	MOGU 100310 TR-28	h_{max}	0.10	0.10	–	–	–	–	–
			v_c	120-220	100-170	–	–	–	–	–
RD..10T3..	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30	f_z	0.50	0.35	0.30	0.25	0.85	0.70	0.45
			v_c	120-200	140-170	100-140	60-100	650-1000	450-650	280-450
	RD.10T3.031.01 SKY77	RDKT 10T3M0 SN-25	f_z	–	–	–	–	1.00	0.85	0.50
			v_c	–	–	–	–	650-1000	450-650	280-450
UD.10T3..	UD.10T3.002.01 SKY77	UDGT 10T325 SR-25	f_z	0.90	–	–	–	–	–	–
			v_c	100-150	–	–	–	–	–	–
	UD.10T3.002.01 AV1077	UDGT 10T325 SR-25	f_z	0.90	0.80	–	–	–	–	–
			v_c	100-150	100-150	–	–	–	–	–
	UD.10T3.002.02 AV1044	UDGT 10T325 SR-28	f_z	0.90	0.80	0.75	–	–	–	–
			v_c	100-170	100-170	100-140	–	–	–	–
	UD.10T3.002.02 AV1055	UDGT 10T325 SR-28	f_z	0.90	0.80	0.75	0.60	–	–	–
			v_c	100-200	100-170	100-140	60-100	–	–	–

	Article	Designation		Titanium S10	Titanium S09	Titanium S08
RD..10T3..	RD.10T3.031.03 AV1055	RDKT 10T3M0 SN-30	f_z	0.35	0.30	0.25
			v_c	60-80	40-70	20-50
UD.10T3..	UD.10T3.002.02 AV1055	UDGT 10T325 SR-28	f_z	0.70	0.60	0.45
			v_c	60-80	40-70	20-50

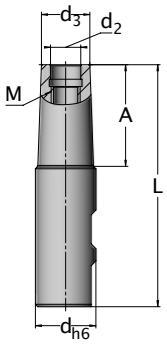
INS		
MO..1003...	08B.0309.001	TX208
RD..10T3...	08B.0375.7991	TX208
UD..10T3...	08B.3509.7991	TX215

Theoretical corner radius page 143
Technical information ramp page 144
Adaptation of f_z at different a_p values page 144

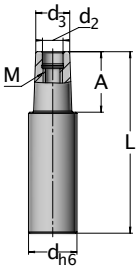
ADAPTERS FOR TOOLS
WITH DIN-TYPE SCREWED END

- Flexible and stable connection, especially for long overhangs
- Extremely high radial run out precision
- Process reliable and faster machining
- Also available with vibration dampening

DIN Weldon shank



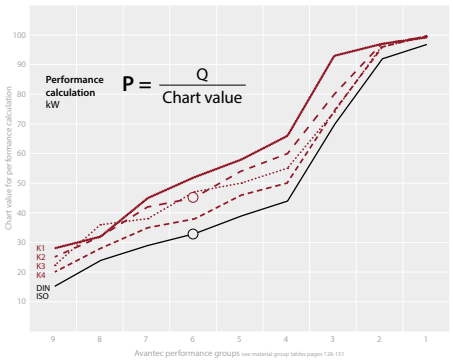
DIN Smooth shank



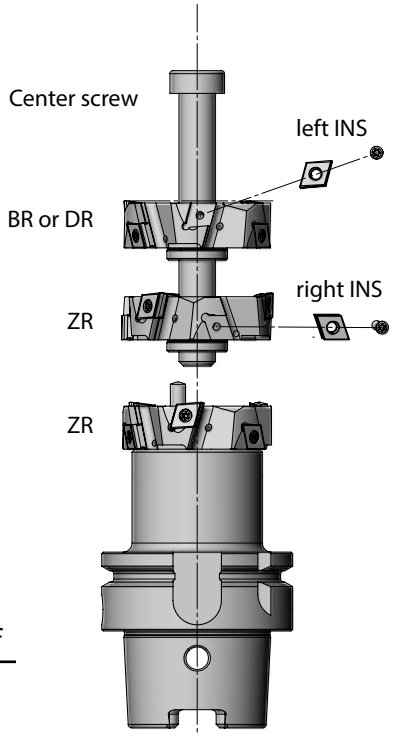
Tool holder adapters for CV90 | HC90 | RO18 | SP18 | TS90 | UD90

Article	d_{h6}	d_2	d_3	L	M	A	kg	DIN1835
09R.2016.001	20	8.5	14	75	8	25	0.14	B
09R.2016.002	20	8.5	14	75	8	25	0.14	A
09R.2020.001	20	10.5	18	75	10	25	0.16	B
09R.2020.003	20	10.5	18	75	10	25	0.16	A
09R.2032.001	20	17	29	81	16	30	0.22	B
09R.2032.002	20	17	29	81	16	30	0.22	A
09R.2524.003	25	12.5	24	128	12	67.5	0.43	A
09R.2524.004	25	12.5	20	100	12	42	0.30	B
09R.2524.005	25	12.5	24	128	12	67.5	0.43	B
09R.2524.006	25	12.5	20	100	12	42	0.30	A
09R.3232.006	32	17	29	100	16	42	0.54	B
09R.3232.007	32	17	29	100	16	42	0.54	A

KNOW HOW



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



The following pages provide you with important information and instructions for a targeted preparation of your Avantec tools for the tasks required in your manufacturing plant and production line – for optimal cutting results.

User and order information, formulas, material/ performance/cutting groups, mounting instructions …

TECHNICAL INFORMATION

MILLING
TERMINOLOGY AND FORMULAS

Maximum chip thickness
mm

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

Metal removal rate
cm^3/min

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

Spindle speed
rpm

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

Cutting speed
m/min

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

Feed rate
mm/min

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

Feed rate per tooth
mm

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

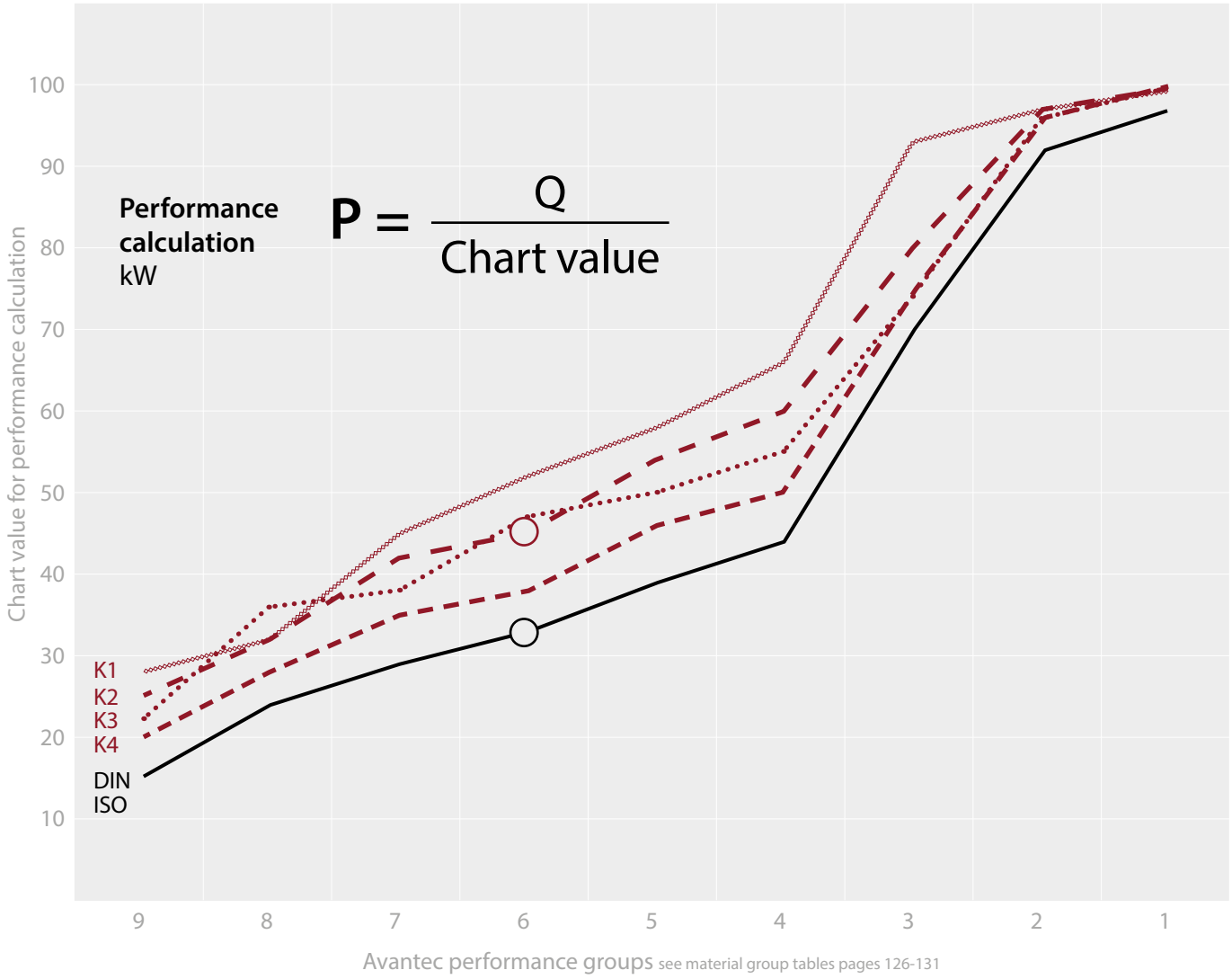
Feed rate per tooth
(at h_{max}) mm

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

a_e	Width of cut	mm
a_p	Depth of cut	mm
D	Tool diameter	mm
f_z	Feed rate per tooth	mm
h_{max}	Max. chip thickness	mm
n	Spindle speed	rpm
P	Power	kW
Q	Metal removal rate	cm^3/min
r	Tool radius	mm
v_c	Cutting speed	m/min
v_f	Feed rate	mm/min
z_{eff}	Number of effective teeth	
π	Coefficient of circumference = 3.14	

POWER CHART Q PER KW

DIN/ISO INSERTS VS. AVANTEC INSERTS



Example high feed milling of a rotary indexing table
Material GGG60 = Avantec performance group 6
UD90 with Avantec insert K3 and DIN/ISO insert
Achieved metal removal rate Q = 1899 cm³/min
(120 mm x 2,2 mm x 7194 mm/min) : 1000

Avantec indexable insert categories			
K1	K2	K3	K4
HD | OE | OF	TC | TN	CN | EC | EN	LN | SN
SE | SX | MO		FN | RD | UD	

Power consumption Avantec indexable insert K3
○ Chart value = 45 | **P** = 1899 : 45 = **42,2 kW**

Power consumption DIN/ISO indexable insert
○ Chart value = 33 | **P** = 1899 : 33 = **57,5 kW**

Result
For a metal removal rate Q of 1899 cm3/min, the Avantec indexable insert K3 requires 26.6% less power/energy than a DIN/ISO indexable insert.

MATERIAL P
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	AFNOR	UNI	BS	UNE	SS	(US) AISI/SAE	JIS	China	GOST
Machining steel													
A22	5	1.0737	9SMnPb36	11SMnPb37	S300Pb	CF9SMnPb36	–	F.2114-12SMnP35	1926	12L14	–	–	–
A22	4	1.0736	9SMn36	11SMn37	S300	CF9SMn36	240M07	F.2113- 12 SMn 35	–	1215	SUM 25	–	–
A22	6	1.0728	60S20	60S22	–	–	–	–	–	–	–	–	–
A22	5	1.0723	15S20	15S22	–	–	–	–	–	–	–	–	–
A22	4	1.0718	9SMnPb28	11SMnPb30	S250Pb	CF9SMnPb28	–	F.2112-11SMnPb28	1914	12L13	SUM22L	Y15Pb	–
A22	4	1.0715	9SMn28	11SMn30	S250	CF9Mn28	230M07	F.2111 - 11SMn28	1912	1213	JIS SUM22	–	–
Case-hardened steel													
A22	6	1.1141	Ck15	C15E	XC15; XC18	C15; C16	080M15	F.1511 - C16K	1370	1015, 1017	S 15 CK	–	–
A22	5	1.0401	C15	C15	CC12; C18RR; XC18	1C15, C15, C16	080M15	F.111	1350	M1015;1016;1017	S15C	–	–
A21	7	1.0301	C10	C10	C10RR	C10	En32A	F151A	–	1008	JIS S 10C	–	1050-10
A20/A18	7	1.7147	20MnCr5	20MnCr5	20MC5	20MnCr5	–	F.150	–	–	SMnC 420 H	20CrMn	–
A19/A18	7	1.7131	16MnCr5	16MnCr5	16MnCr5	16MnCr5	527M20	F.1515 - 16 MnCr 5	2127	5115	–	15CrMn	18ChG
A19	7	1.6587	17CrNiMo6	17CrNiMo6	18NCD6	18NiCrMo7	820A16	F.1560-14NiCrMo13	–	–	–	17Cr2Ni2Mo	–
A19	7	1.5752	14NiCr14	14NiCr14	12NC15	–	655M13	–	–	3415; 3310	SNC815(H)	–	–
Spring steel													
A21/A18	7	1.1274	Ck101	C101E	XC100	C100	060A96	–	1870	1095	SUP4	–	–
A21	6	1.1248	Ck75	C75E	–	–	–	–	–	–	–	–	–
A21/A18	7	1.1231	Ck67	C67E	–	–	–	–	–	–	–	–	–
A18/A17	7	1.8159	50CrV4	51CrV4	50CV4	50CrV4	735A50	F1430-51CrV4	2230	6150	SUP10	–	–
A18/A16	7	1.7176	55Cr3	55Cr3	55C3	55Cr3	525A60	F.1631-55 Cr3	2253	5155	SUP9(A)	–	–
A18	7	1.5029	71Si7	71Si7	–	–	–	–	–	–	–	–	–
Heat resistant cast steel													
A16	8	1.4710	GX30CrSi6	GX30CrSi6	–	–	–	–	–	–	–	–	–
A18	7	1.2312	40CrMnMoS86	40CrMnMoS8-6	–	–	–	–		P20	–	–	–
A18/A17	7	1.2311	40CrMnMo7	40CrMnMo7	40 CMD 8	–	–	–	–	–	–	5CrMnMo	–
A18/A17	7	1.2241	51CrV4	51CrMnV4	–	–	–	–	–	–	–	–	–
A18/A17	7	1.2210	115CrV3	115CrV3	–	–	–	–	–	–	–	–	–
A18/A17	7	1.2162	21MnCr5	21MnCr5	–	–	–	–	–	5120	SCR420H	–	–
A18/A17	8	1.2067	100Cr6	100Cr6	–	–	–	–	–	–	–	–	–
A17/A16	7	1.2767	X45NiCrMo4	X45NiCrMo4	–	–	–	–	–	–	–	–	–
A17	8	1.2436	X210CrW12	X210CrW12	X210CrW12-1	X215CrW121KU		X210CrW12	2312	(D6)	SKD2	Cr12W	
A17	7	1.2378	X220CrVMo122	X220CrVMo12-2	–	–	–	–	–	–	–	–	–
A17	7	1.2376	X96CrMoV12	X96CrMoV12	–	–	–	–	–	–	–	–	–
A17/A16	7	1.2080	X210Cr12	X210Cr12	Z200C12	X210Cr13KU	BD3	F.5212-X210Cr12	–	D3	SKD1	Cr12	CH 12
A16	8	1.2379	X155CrVMo121	X155CrMoV12-1	Z160CDV12	X155CrVMo121KU	BD2	F5211X160CrMoV12	2310	D2	SKD11	Cr12Mo1V	–
Cold extrusion steel													
A20	5	1.5919	15CrNi6	15CrNi6	16NC6	–	–	–	2511	4320	–	–	15ChGN2T
Nitriding steel													
A18/A17	7	1.8519	31CrMoV9	31CrMoV9	–	–	–	F.1721	–	–	–	–	–
A18	7	1.8509	41CrAlMo7	41CrAlMo7	40CAD6, 12	41CrAlMo7	905M39	F.1740-41CrAlMo7	2940	A355 Cl.A	–	–	–

MATERIAL P
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	AFNOR	UNI	BS	UNE	SS	(US) AISI/SAE	JIS	China	GOST
Rustproof steels													
A20	6	1.4113	X6CrMo171	X6CrMo17-1	Z8CD17.01	X8CrMo17	434S17	F3116-X6CrMo171	2325	434	SUS434	10Cr17Mo	–
A20	7	1.4016	X6Cr17	X6Cr17	Z6Cr17	X8Cr17	430S17	F.3113-X8 Cr17	2320	–	–	10Cr17	12Ch17
A20	7	1.4000	X7Cr13	X6Cr13	Z8C13	X6Cr13	403S17	F.3110-X6Cr13	2301	403	SUS403	06Cr13	–
A18	6	1.4313	X4CrNi134	X3CrNiMo13-4	Z4CND13.4M	(G)X6CrNi304	425C11	–	2385	F6NM	SCS5	–	–
A18	7	1.4125	X105CrMo17	X105CrMo17	Z100CD17	–	–	–	–	–	SUS 440 C	102Cr17Mo	95Ch18
A18	7	1.4112	X90CrMoV18	X90CrMoV18	–	–	–	–	–	440B	SUS440B	90Cr18MoV	–
A18	7	1.4031	X38Cr13	X39Cr13	Martensit	–	–	–	–	–	–	–	–
A18	6	1.4021	X20Cr13	X20Cr13	Z20C13, Z20Cr13	X20Cr13	S62	F.3402-X20 Cr 13	2303	420	JIS SUS 420J1	20Cr13	20Ch13
A18	6	1.4006	X10Cr13	X10Cr13	Z10C14	X12Cr13	410S21	F.3401	2302	410	SUS410	12Cr13	15Ch13L
A17		1.4548	–	–	Z6CNU17-04	–	–	–	–	630	SUS 630	05Cr17Ni4Cu4Nb	–
High-speed steel													
A16	8	1.3355	S18-0-1	HS18-0-1	–	–	–	–	–	–	–	–	–
A16	8	1.3348	S2-9-2	HS2-9-2	Z100WCWV	HS 2 9 2	–	HS 2-9-2	2782	M7	SKH58	W2Mo9Cr4V2	–
A16	8	1.3343	S6-5-2	HS6-5-2	Z85WDCV	X82WMo0605KU	BM2	HS 6-5-2	2722	M2 reg.C	SKH 51	–	–
A16	8	1.3255	S18-1-2-5	HS18-1-2-5	–	–	–	–	–	–	–	–	–
A16	8	1.3247	S2-10-1-8	HS2-10-1-8	–	HS2-9-1-8	BM42	F.5615 7-4-2-5	2716	M42	SKH 59	W2Mo9Cr4VCo8	
A16	8	1.3243	S6-5-2-5	HS6-5-2-5	Z85WDKCV	HS 6-5-2-5	BM35	HS 6-5-2-5	2723	M41	SKH55	–	–
Unalloyed structural steel													
A22	7	1.0570	St52-3	S355J0	–	–	–	–	–	–	–	–	–
A22	7	1.0144	St44-3	S275J2G3	E28-3; E28-4	Fe 430 B	4360 43 C	Fe 430 D1 FF	1412; 1414	A573-Gr.70	SM41C	–	St4sp
A22	7	1.0116	St37-3	S235J2G3	E24-4	Fe 360 D FF	4360 40D	Fe 360 D1 FF	1312	A573-Gr.58	SS 34	–	K16D
A22	5	1.0037	St37-2	S235JR	E24-2	–	1449 37/23HR	Fe360B	1311	1015 A36	STKM12A	–	–
High-temperature structural steel													
A21	7	1.5423	16Mo5	16Mo5	–	16Mo5 kg	1503-245-420	F.2602-16Mo5	–	4520	SB480M	–	–
A21	7	1.5415	15Mo3	16Mo3	15D3	16Mo3KW	1503-243 B	F.2601-16Mo3	2912	A204Gr.A	ASTM A20Gr.A	–	–
A21	5	1.1133	20Mn5	20Mn5	20M5	G22Mn3; 20Mn7	120M19	F.1515-20Mn6	1132	1022; 1518	SMnC420	20 Mn2	20GSL
A20	7	1.7380	10CrMo910	10CrMo9-10	–	–	–	–	–	–	–	–	–
A20	7	1.7337	16CrMo44	16CrMo4-4	15 CD 4.5	14 CrMo 4 5	1501-620 Gr.27	–	2216	A387Gr.12CL.2	–	–	–
A20	7	1.7335	13CrMo44	13CrMo4-5	15CD3.5	14CrMo4 5	1501-620Gr.27	F.2631-14CrMo45	2216	A182 F-11	ASTM A182	–	–
Fine-grained structural steel													
A22	7	1.0562	StE355	P355N	–	–	–	–	–	–	–	–	–
A19/A18	7	1.7149	20MnCrS5	20MnCrS5	–	–	–	–	–	–	–	–	–
A18	7	1.7139	16MnCrS5	16MnCr5	16MnCr5	16MnCr5	527M20	F.1515 - 16 MnCr 5	2127	5115	–	15CrMn	18ChG
Unalloyed tool steel													
A21	7	1.1740	C60W3	C60U	–	–	–	–	–	–	–	–	–
A21	7	1.1645	C105W2	C105W2	–	–	–	–	–	–	–	–	–
A21	6	1.1545	C105W1	C105U	–	–	–	–	–	–	–	–	–

MATERIAL P
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	AFNOR	UNI	BS	UNE	SS	(US) AISI/SAE	JIS	China	GOST
Cold extrusion steel													
A20/A18	7	1.2842	90MnCrV8	90MnCrV8	–	–	–	–	–	–	–	–	–
A19/A18	7	1.2550	60WCrV7	60WCrV7	–	–	–	–	–	–	–	–	–
A19/A18	8	1.2542	45WCrV7	45WCrV7	–	–	–	–	–	–	–	–	–
A19	7	1.2510	100MnCrW4	95MnWCr5	–	–	–	–	–	–	–	–	–
A18/A17	6	1.2713	55NiCrMoV6	55NiCrMoV6	–	–	BH224	F.528	–	L6	–	5CrNiMo	5 ChNM
A18	7	1.2601	X165CrMoV12	X165CrMoV12	–	X165CrMoW12KU	BD2	X160CrMoV12	2310	D2	–	Cr12MoV	–
Hot-work tool steel													
A18/A17	7	1.2714	56NiCrMoV7	55NiCrMoV7	55NCDV7	–	–	F.520.S	–	6F3	SKT4	–	–
A18/A16	7	1.2365	X32CrMoV33	32CrMoV12-28	–	–	–	–	–	–	–	–	–
A18/A16	7	1.2344	X40CrMoV51	X40CrMoV5-1	Z40CDV5	X35CrMoV05KU	BH13	X40CrMoV5	2242	H13	SKD61	4Cr5MoSiV1	4CH5MF1S
A18/A16	7	1.2343	X38CrMoV51	X37CrMoV5-1	–	–	–	–	–	–	–	–	–
Tempering steel													
A22/A20	6	1.1181	Ck35	C35E	XC32	–	080M36	F.1130 - C 35 k	1572	1035	S 35 C	–	–
A22/A19	7	1.1158	Ck25	C25E	2C25; XC25	C25	070M26	F.1120-C25k	1450	1025	S25C; S28C	–	–
A22	7	1.0402	C22	C22	AF42C20; XC25; 1C22	C20; C21; C25	055M15;070M20	F.112	1450	M1020;1023	S20C; S22C	–	–
A21/A20	7	1.1221	Ck60	C60E	XC60	C60	080A62	C60	1678	1060	S58C	–	–
A21/A20	7	1.1201	Cm45	C45R	–	–	–	–	–	–	–	–	–
A21/A19	6	1.1191	Ck45	C45E	XC42	C45	080M46	F-1140 - C45K	1672	1045	S45C	–	–
A21/A19	7	1.0535	C55	C55	C54	C55	070M55	F115	1655	1055	S55C	–	–
A21/A19	7	1.0511	C40	C40	–	–	–	–	–	–	–	–	–
A21/A19	7	1.0503	C45	C45	AF 65 C 45	C45	080M46	F.114	1650	1045	S45C	–	–
A21/A19	7	1.0501	C35	C35	AF 55 C 35	C35	060A35	F.113	1550	1035	S35C	–	–
A20/A21	6	1.0601	C60	C60	CC55	C60	080A62	–	–	1060	S58C	–	–
A19/A18	7	1.7361	32CrMo12	32CrMo12	30CD12	32CrMo12	722M24	F.124.A	2240	–	–	–	–
A19/A18	7	1.7225	42CrMo4	41CrMo4	42CD4	42CrMo4	708M40	F.8232-42CrMo4	2244	4140	SCM440(H)	–	–
A19/A18	8	1.7218	25CrMo4	25CrMo4	25CD4	25CrMo4(KB)	1717CDS110	F.8372-AM26CrMo4	2225	4130	SCM420/430	–	–
A19/A18	7	1.7033	34Cr4	34Cr4	32C4	34Cr4(KB)	530A32	F.8221-35Cr4	–	5132	SCr430(H)	–	–
A19/A17	7	1.3505	100Cr6	100Cr6	100C6	100Cr6	535A99	F.1310-100Cr6	2258	52100	SUJ2	–	–
A18	7	1.7035	41Cr4	41Cr4	42C4	41Cr4	530M40	F.1211-41Cr4DF	–	5140	SCr440(H)	–	–
A18/A17	7	1.6582	34CrNiMo6	34CrNiMo6	35NCD6	35NiCrMo6(KB)	817M40	F 1272-40NiCrMo7	2541	4340	SNCM447	–	–
A18	8	1.6511	36CrNiMo4	36CrNiMo4	40NCD3	36NiCrMo4(KB)	816M40	F1280-35NiCrMo4	–	9840	–	–	–
A18	7	1.5736	36NiCr10	36NiCr10	–	–	–	–	–	–	–	–	–
A18	7	1.5710	36NiCr6	36NiCr6	35NCD6	–	640A35	–	–	3135	SNC236	–	–
A18	7	1.5121	46MnSi4	46MnSi4	–	–	–	–	–	–	–	–	–
A18	7	1.3563	43CrMo4	43CrMo4	–	–	–	–	–	–	–	–	–
A18	7	1.1167	36Mn5	36Mn5	40M5	–	150M36	F.1203-36Mn5	2120	1335	SMn438(H)	–	–
A18	7	1.1157	40Mn4	40Mn4	35M5	–	150M36	–	–	1035	1039	–	–
Bearing steel													
A19	7	1.3520	100CrMn6	100CrMnSi6-4	–	–	–	–	–	–	–	–	–

MATERIAL K
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	AFNOR	UNI	BS	UNE	SS	(US) AISI/SAE	JIS	China	GOST
Gray cast iron													
D21	**3**	0.6030	GG30	EN-GJL-300	Ft 30 D	G30	Grade 300	FG30	01 30-00	A48 45 B	FC 30	HT300	SC 30
D21	**3**	0.6020	GG20	EN-GJL-200	Ft 20 D	G20	–	–	–	30B	FC 200, FC 20	HT200	SC 20
D21	**3**	0.6015	GG15	EN-GJL-150	Ft 15 D	G15	Grade 150	FG15	115	–	FC 150	HT150	SC 15
D21	**2**	0.6010	GG10	EN-GJL-100	–	–	–	–	–	–	–	–	–
D20	**4**	0.6035	GG35	EN-GJL-350	Ft 35 D	G35	Grade 350	FG35	01 35-00	A48 50 B	FC 35	–	SC 35
D20	**4**	0.6025	GG25	EN-GJL-250	Ft 25 D	G25	Grade 260	FG25	01 25-00	A48 40 B	FC 25	HT250	SC 25
D19	**3**	0.6040	GG40	EN-GJL-400	Ft 40 D	–	Grade 400	–	01 40-00	A48 60 B	–	–	SC 40
Nodular graphite													
D19	**3**	0.7043	GGG-40.3	EN-GJS-400-18-LT	–	–	–	–	–	–	–	–	–
D18	**4**	0.7033	GGG-35.3	EN-GJS-350-22-LT	–	–	–	–	–	–	–	–	–
D17	**6**	0.7060	GGG-60	EN-GJS-600-3	FGS 600-3	GS 600/3	SNG 600/3	–	07 32-0 3	A43D2	FCD 60	QT600-3	VC 60-2
D17	**3**	0.7050	GGG-50	EN-GJS-500-7	FGS 500-7	GS 500/7	SNG 500/7	FGE 50-7	07 27-02	80-55-06	FCD 50	QT500-7	VC 50-2
D17	**5**	0.7040	GGG-40	EN-GJS-400-15	FGS 400-12	GS 400-12	Grade 420/12	FGE 38-17	07 17-02	60-40-18	FCD 40	QT400	VC 40
D16	**4**	0.7080	GGG-80	EN-GJS-800-2	–	–	–	–	–	–	–	–	–
D16	**4**	0.7070	GGG-70	EN-GJS-700-2	FGS 700-2	GS 700/2	SNG 700/2	FGS 70-2	07 37-0 1	100-70-03	FCD 70	QT700-2	VC 70-2
Malleable cast iron													
D18	**4**	0.8135	GTS-35-10	EN-GJMB-350-10	MN 35-10	–	B 340/12	–	815	32510	FCMB 340	–	KC 35-10
D18	**4**	0.8040	GTW-40-05	GJMW-400-5	MB 40-10	–	W 410/4	–	–	–	FCMW 350	–	–
D18	**4**	0.8035	GTW-35-04	GJMW-350-4	MB 35-7	–	W 35-04	–	–	–	FCMW 330	–	–
D17	**4**	0.8145	GTS-45-06	EN-GJMB-450-6	MP 50-5, Mn 450	GMN 45	P 440/7	–	852	40010	FCMW 370	–	KC 45-7
D17	**4**	0.8045	GTW-45-07	GJMW-450-7	MB 45-7		45-07	–	–	–	FCMWP 440	–	–
D16	**4**	0.8055	GTW-55	GJMW-550	–	–	–	–	–	–	–	–	–
D16	**4**	0.8170	GTS-70-02	EN-GJMB-700-2	–	–	–	–	–	–	–	–	–
D16	**4**	0.8165	GTS-65-02	EN-GJMB-650-2	Mn 650-3	GMN 65	P570/3, P 65-02	–	–	A220-70003	FCMP 590	–	KC 63-2
D16	**4**	0.8155	GTS-55-04	EN-GJMB-550-4	MP 60-3	GMN 55	P 510/4, P540/5	–	856	50005	FCMP 490	–	KC 55-4
D16	**4**	0.8065	GTW-65	GJMW-650	–	–	–	–	–	–	–	–	–

MATERIAL N
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	Kc	AFNOR	UNI	BS	UNE	SS	AISI/SAE	JIS	China	GOST
Cast aluminum														
E82	1	3.2582	GD-AlSi12	AlSi12(Fe)	508	–	–	–	–	–s	–	–	–	–
E82	1	3.2383	G-AlSi10Mg(Cu)	AlSi10Mg(Cu)	508	A-S9GU	–	LM9	–	4253	A360.2	JIS ADC3 (AL 4)	–	–
E82	1	3.2382	GD-AlSi10Mg	AlSi10Mg(Fe)	508	–	–	–	–	–	–	–	–	–
E82	1	3.2381	G-AlSi10Mg	AlSi10Mg	508	A-S10G	3051	LM9	L-2560, L-2561	4253	–	JIS AC4 A (AL 4V)	ZL104	AL4V
E82	1	3.2371	G-AlSi7Mg	AlSi7Mg	481	A-S7G0.3	7257	2L99	L-2651	4244	4218 B	AC4C	–	AL9
E82	1	3.2341	G-AlSi5Mg	AlSi5Mg	508	A-S4G	3054	DTD716B	L-2570	–	–	–	–	–
Wrought aluminum alloy														
E82	1	3.3315	AlMg1	AlMg1C	496	–	5764	N41	L-3350	4106	5005A	A5005	–	1510
E81	2	3.3206	AlMgSi0.5	AlMgSi0.5	583	–	–	–	–	–	–	–	–	–
E81	2	3.2315	AlMgSi1	AlMgSi1	583	A-SGM0, A-SGM0.7	3571	H30	L-3451	4212	–	–	–	AD35
E81	2	3.1655	AlCuBiPb	AlCu6BiPb	583	A-U5PbBi	6362	FC1	L-3182	4355	–	A2011	–	–
E81	1	3.0515	AlMn1	AlMn1	496	–	3568	N3	L-3811	4054	–	–	LF12	AMc
E81	1	3.0255	Al99.5	Al99.5	496	A5	4507	1B	L-3051	4007	1050A	A1050, A1x1	L2	AD0
Copper-nickel alloy														
E82	1	2.0872	CuNi10Fe1Mn	CuNi10Fe1Mn	328	–	–	–	–	–	–	–	–	–
Copper-nickel-zinc alloy														
E80	3	2.0790	CuNi18Zn19Pb1	CuNi18Zn19Pb1	1120	–	–	–	–	–	–	–	–	–
Copper zinc alloy														
E82	1	2.0402	CuZn39Pb2	CuZn40Pb2	500	CuZn40Pb2	–	CZ 122	–	–	–	–	–	–
E82	1	2.0401	CuZn39Pb3	CuZn39Pb3	450	CuZn40Pb3	–	CZ 121	–	–	–	–	–	ЛС59-1
E81	2	2.0240	CuZn15	CuZn15	655	–	–	–	–	–	–	–	–	–
E80	4	2.0321	CuZn37	CuZn37	1180	CuZn37	–	–	–	–	–	C2720	H63	–
Copper tin alloy														
E80	4	2.1030	CuSn8	CuSn8	1180	–	–	–	–	–	–	–	–	БрОФ7-0.2
Continuous cast alloy														
E81	2	2.1176	G-CuPb10Sn	CuSn10Pb10-C	554	CuPb10Sn10	–	LB2	–	–	–	–	–	–
Cast brass														
E80	2	2.0591	GK-CuZn38Al	CuZn38Al-C	655	–	–	DCB 3, PCB1	–	–	–	–	–	–
E80	2	2.0590	G-CuZn40Fe	CuZn40Fe	655	–	–	–	–	–	–	–	–	–
Bronze														
E80	4	2.0966	CuAl10Ni5Fe4	CuAl10Ni5Fe4	1300	CuAl9Ni5Fe3Mn	–	CA 104	–	–	–	–	–	БрАЖН10-4-4
E80	1	2.0936	CuAl10Fe3Mn2	CuAl10Fe3Mn2	328	CuAl9Fe3Mn2	–	CA 105	–	–	–	–	–	БрАЖМц10-3-1.5
Red brass														
E81	2	2.1096	G-CuSn5ZnPb	CuSn5Zn5Pb5-C	756	CuPb5Sn5Zn5	–	LG2	–	–	–	–	–	–
E81	2	2.1098	G-CuSn2ZnPb	CuSn3Zn8Pb5-C	554	–	–	LG1	–	–	–	–	–	–

MATERIAL M + S
MACHINING AND PERFORMANCE GROUPS

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	Kc	AFNOR	UNI	BS	UNE	SS	AISI/SAE	JIS	China	GOST
Rust- and acid resistant steels austenitic														
C12	8	1.4876		X10CrNiAlTi32-21	–	Z10NC32-21	–	–	–	–	800	NCF800	–	–
C12	8	1.4845	X12CrNi2521	X8CrNi25-21	–	Z 12 CN 25-20	X6CrNi2520	310 S 24	–	2361	310 S	SUS310	–	–
C11	7	1.4878	X12CrNiTi189	X10CrNiTi18-10	1851	Z6CNT18-10	–s	–	F3523-X6CrNiTi1811	–	321 H	–	–	–
C11	8	1.4550	X6CrNiNb1810	X6CrNiNb18-10	1950	Z6CNNb18.10	X8CrNiNb1811	–	–	2338	347	US 347	–	–
C11	7	1.4529	X1NiCrMoCuN25206	X1NiCrMoCuN25-20-6	1851	–	–	–	–	–	–	–	–	–
C11	6	1.4401	X5CrNiMo17122	X4CrNiMo17-12-2	1540	Z7CND17-11-02	–	316S31	F.3534	2347	–	SUS316	–	–
C11	8	1.4311	X2CrNiN1810	X2CrNiN18-10	2450	–	–	304 S 61	–	–	–	–	–	–
C11	8	1.4310	X12CrNi177	X10CrNi18-8	1900	Z11CN18-08	X12CrNi17 07	301S21	F.3517	2331	–	SUS301	–	12Ch18N9
C10	8	1.4435	X2CrNiMo18143	X2CrNiMo18-14-3	2300	Z3CND17-12-03, Z3CND18-14-03	–	316S11,316S13,316S31	–	2353	316L	SUS316L	–	03Ch17N14M3
C10	8	1.4429	X2CrNiMoN17133	X2CrNiMoN17-13-3	2300	Z3CND17-12Az	–	316S63	F.3543	2375	–	SUS316LN	–	–
C10	8	1.4306	G-X2CrNi189	X2CrNi19-11	2450	Z2CN18.10	X2CrNi18.11	304S12	F.3503-X2CrNi19-10	2352	304L	SCS19	0Cr19Ni10	03 Ch 18N11
C10	8	1.4301	X5CrNi1810	X5CrNi18-10	1950	Z6CN18.09	X5CrNi1810	304S15	F.3551	2332	304	SUS304	06Cr19Ni10	08 Ch 18N10
Rust- and acid resistant steels austenitic/ferritic														
C10	6	1.4460	X4CrNiMoN2752	X3CrNiMoN27-5-2	1442	Z3CND25-07Az, Z5CND27-05Az	–	–	–	2324	329	SUS 329 J1	022Cr25Ni6Mo2N	–
C09	8	1.4462	X2CrNiMoN2253	X2CrNiMoN22-5-3	2450	Z2CND22	–	–	–	2377	–	SUS 329J3L	022Cr22Ni5Mo3N	–
C09	7	1.4410	G-X10CrNiMo189	X2CrNiMoN25-7-4	1851	Z3CND25.06Az	–	X2CrNiMoN25-7-4	X2CrNiMoN25-7-4	X2CrNiMoN25-7-4	–	–	–	–

Mach.Gr.	Perf.Gr.	DIN no. | Material		EN	Kc	AFNOR	UNI	BS	UNE	SS	(US) AISI/SAE	JIS	China	GOST
Titanium and nickel alloys														
S10	4	3.7064	Ti99.5	Ti99.5	1232	–	–	–	Ti-P04	–	4901, 4921	–	–	–
S10	4	3.7024	Ti99.8	Ti99.8	1232	T-35	–	TA.1	Ti-P01	–	–	–	–	BT1-00
S09	9	2.4819	NiMo16Cr15W	NiMo16Cr15W	2700	–	–	–	–	–	–	–	–	XH65MB
S09	9	2.4602	NiCr21Mo14W	NiCr17Mo17FeW	2678	–	–	–	–	–	–	–	–	–
S08	5	3.7185	TiAl4Mo4Sn2	TiAl4Mo4Sn2Si0.5	1384	–	–	–	–	–	–	–	–	–
S08	5	3.7164	TiAl6V4	Ti6Al4V	1384	T-A6V	–	–	Ti-P63	–	–	–	–	BT6
S08	8	2.4668	NiCr19FeNbMo	NiCr19Nb5Mo3	2309	NC19FeNb	–	HR 8	–	–	5383	–	–	–
S08	7	2.4631	NiCr20TiAl	NiCr20TiAl	1752	NC20TA	–	–	–	–	–	NCF80A	–	–
S08	9	1.4944	A286	X5NiCrTi26-15	2678	Z6NCTDV25-15B	–	HR51	–	–	J467	–	–	–

INDEXABLE INSERTS
TYPE CODE

Article	E	N.			12	06		029.13					SKY77
Key	1	2	3	4	5	6	7	8	9	10	11	12	13
Designation	E	N	H	Q	12	06	10		S	L	28	W	

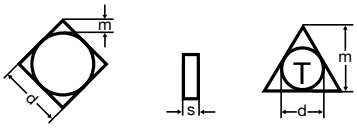
1 Insert shape

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

2 Clearance angle

C 7° D 15° E 20° F 25° N 0° O Drawing/ description required

3 Tolerances (excerpt)



Admissible deviations in mm

	d	m	s
A	± 0.025	± 0.005	± 0.025
E	± 0.025	± 0.025	± 0.025
F	± 0.013	± 0.005	± 0.025

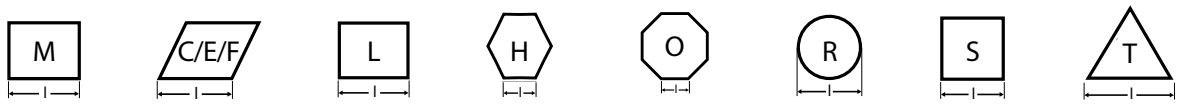
Admissible deviations in mm

	d	m	s
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

4 Machining and mounting characteristics

Q W R N T U X Drawing/ description required

5 Length of cutting edge/diameter



6 Insert thickness

7 Corner radius (excerpt)

04 R = 0.4
08 R = 0.8
10 R = 1.0
25 R = 2.5

Clearance angle
on face cutting edge
F = 25°
Z = other clearance angles

00 for diameter with inch
dimensions converted to mm
M0 for diameter
in metric dimensions

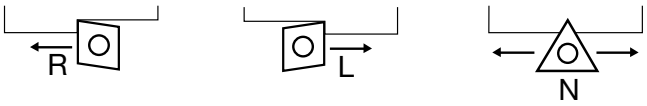
Setting angle **K**
A = 45°
E = 75°
P = 90°

8 Document number

Is issued by the manufacturer for internal document control.

9 Cutting edge shape

10 Cutting direction



11 AVANTEC geometry

-20 Roughing geometry | heavy-duty machining | medium depths of cut | high tooth feed rates | cast iron machining
-23 Roughing geometry | heavy-duty machining | large depths of cut | high tooth feed rates
-25 Roughing geometry | heavy-duty machining | medium depths of cut | high tooth feed rates
-28 Roughing/finishing geometry | medium depths of cut | medium tooth feed rates
-30 Roughing/finishing geometry for low tooth feed rates
-33 Finishing geometry

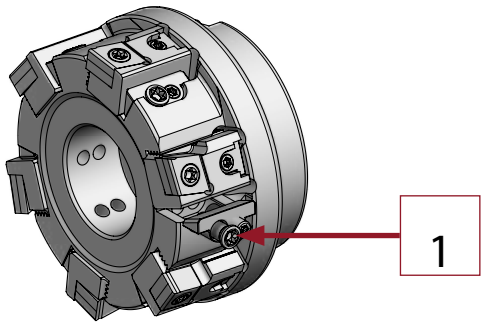
12 Additional special purpose geometries

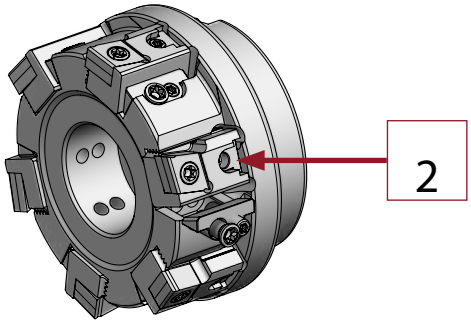
S Finishing
V Low vibration machining
W Combination of S and V geometries

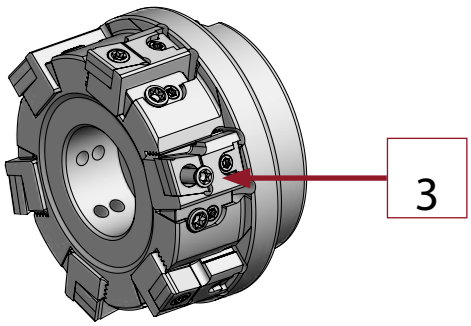
13 AVANTEC Qualities

AV1044 | AV1055 | AV1077 (TiAlSiN) CAN²26 | CAN²77 (Al_2O_3) NERO26 | NERO²77 (TiAlN) SKY26 | SKY77 (AlTiN)

MOUNTING | FINISHING CUTTERS
EK90 | SK90 CARTRIDGE | REPLACING INS







1. **Loosen lock screw (double threaded) and clamp bolt**

2. **Reset cartridges in axial direction by using setting screw (double threaded)**, therefore screw back the adjustment wedge to its initial position.

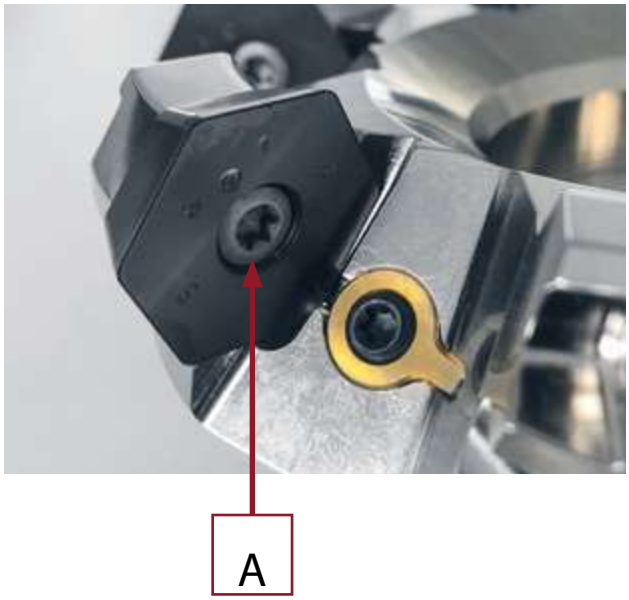
3. **Replace indexable inserts**
   Tighten new indexable inserts with matching Torx screwdriver. Also tighten all other screws and/or fix by locknut until the required tightening torque has been reached, see table on page 142.

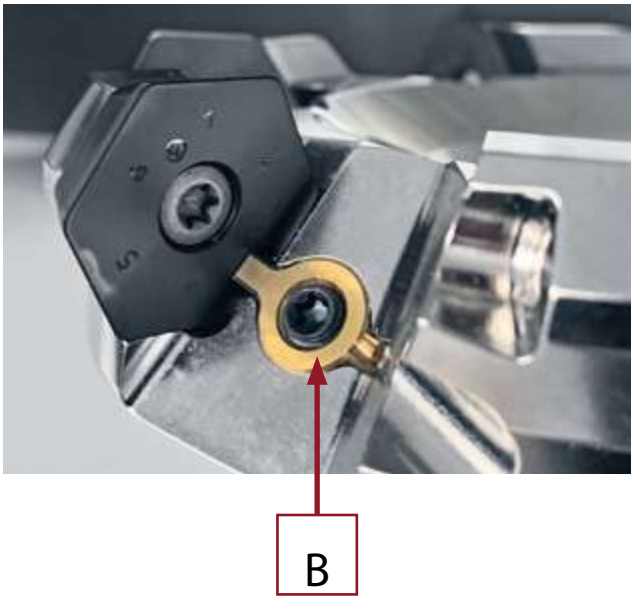
4. **Set by using a pre-setting device or on the measuring device**
   Identify the highest cutting edge by using a pre-setting device (when using a measuring device, individually pull through each cutting edge). In both cases, reference on the highest cutting edge and set to zero. Next, set all other cutting edges to the reference dimension from 0 up to ± 0.003 mm by using the adjustment element.

   No further cutting edge fixation required. Replacing the inserts and setting the indexable inserts takes 15-20 min.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MOUNTING | FACE MILLING CUTTERS
HD60 CLAMPING WEDGE | INS REPLACEM.





VARIANT A
Fixation of indexable insert with fixing screw

1. The clamping wedge is recessed in the base. Loosen the indexable insert's fixing screw.
2. Place the new indexable insert into the insert seat. The exact fit is achieved by pushing the insert against the side walls of the insert seat.
3. Screw in fixing screw until the required tightening torque has been reached, see table on page 142.

NOTE
If not sure, check the gap width between insert seat and indexable insert by using a 0.02 mm spacer foil – everything is ok if the gap is too narrow for the foil.

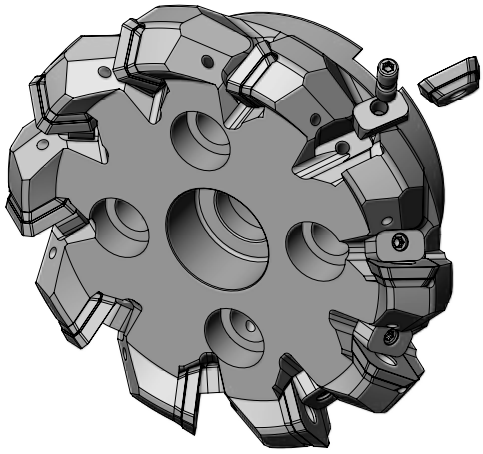
VARIANT B
Fixation of indexable insert with additional clamping

1. Follow the instructions of VARIANT A
2. First, completely unscrew the fixing screw.
3. Rotate clamping wedge by 180° – the clamping nose points in the direction of the indexable insert.
4. Screw in the clamping wedge's double-threaded screw until the required tightening torque has been reached, see table on page 142.

NOTE
First loosen clamping wedge when replacing the indexable insert with additional clamping, the indexable insert might break otherwise.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MOUNTING | WEDGE-MOUNTED INDEXABLE INSERT



Mounting a wedge-mounted indexable insert

1. Release wedge by a half turn of the double-threaded screw.

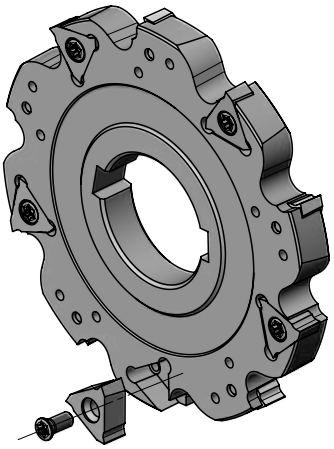
2. Place indexable insert on the insert seat, lock in place by pushing the insert to the side walls from the insert seat.

3. Tighten double-threaded screw until the clamping wedge is in firm contact with the indexable insert and the required tightening torque has been reached, see table on page 142.

   These instructions also apply to face milling cutters SE60 and SX45 and finishing cutters EK90 and SK90.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MOUNTING | TC/TN INDEXABLE INSERT



Mounting a TC/TN indexable insert

The 3-side imbedding of the TC/TN indexable insert creates a snug fit for the indexable insert.

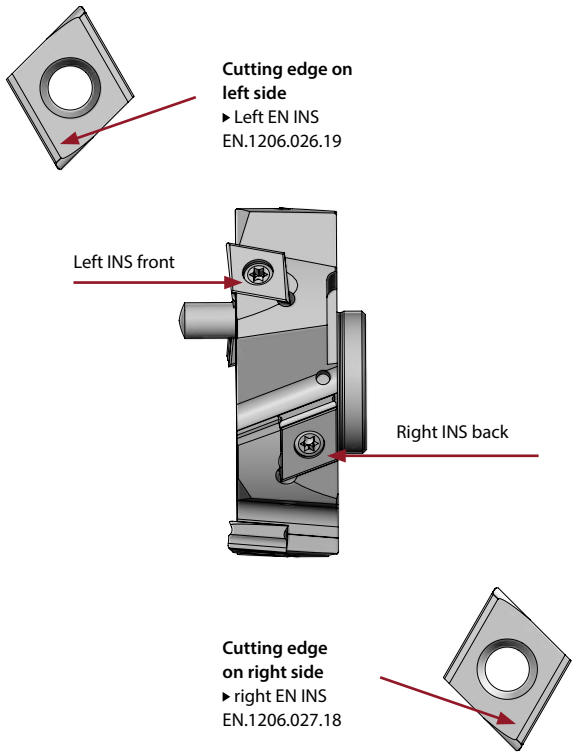
1. Do not tilt the indexable insert when placing it.
2. Insert the indexable insert in its seat by exerting slight pressure.
3. Screw down the screw until the specified tightening torque has been reached, see table on page 142.

Reversing or replacing a TC/TN indexable insert

1. First, completely unscrew the fixing screw.
2. Using the torque screwdriver handle, tap lightly on the side milling cutter side on which the indexable insert is to be replaced. Please make sure not to tap on the side opposite of the indexable insert to be replaced.
3. Caused by the "inertia" effect, the indexable insert moves upwards by itself from its seat and can be replaced or reversed.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MOUNTING | CN/EN/FN INDEXABLE INSERT



Mounting a CN/EN/FN indexable insert

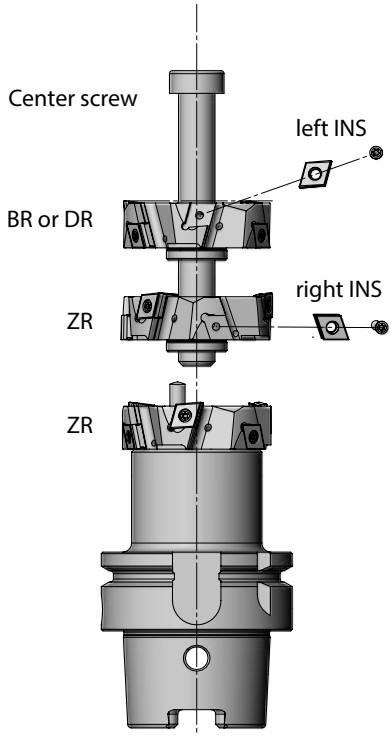
1. Place the indexable insert on the seat. Make sure to mount left- and/or right-cutting CN/EN/FN indexable inserts in the correct seats.

2. Screw down the fixing screw, this may cause the indexable insert to rise. This is corrected by pressing the CN/EN/FN indexable insert back into place while screwing down the screw.

3. Override the tightening and continue screwing down the screw until the specified tightening torque has been reached, see table on page 142.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MOUNTING | MULTIRING | INTERM./ /BOTTOM/DOUBLE CUTTING RINGS



Mounting the Multirings

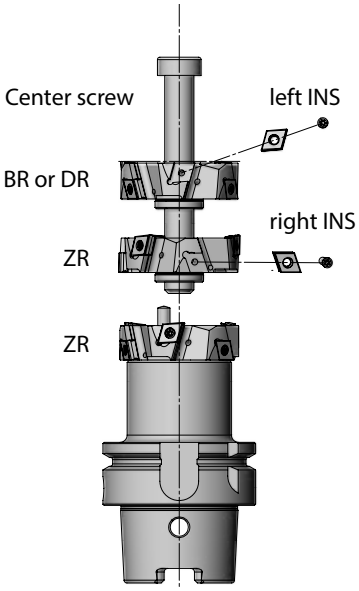
1. Place the intermediate rings tipped with indexable inserts on the shank one after the other. A dowel pin is used for correct positioning. The intermediate rings are interchangeable with each other.

2. The cutting edge stack is completed by the bottom resp. double cutting ring.

3. Pass the matching fixing screw through the complete cutting edge stack and screw in until the required tightening torque has been reached, see table on page 142.

Always make sure to keep everything clean during mounting. We recommend using our screw lubricant for an easy replacement and/or release of indexable insert and screw: order no. 08F.0050.001

MULTIRING | COMPONENTS AND CENTER SCREW CALCULATION



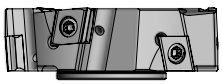
When ordering a Multiring, the minimum components required are:

- Tool holder
- Center screw
- Intermediate ring
- Bottom and/or double cutting ring

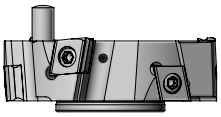
The different Multiring lengths result from depth of cut a_p and the respective selection of

- Intermediate ring
- Bottom and/or double cutting ring

Center screw
Article
08Z.16_ _.6912



Height BR = 23.2 mm



Height ZR = 22 mm

Center screw
Article
08Z.1611.6912

How to calculate the overall length and order size of the center screw.
Example: Your milling tool is a Multiring EM90.
Tool Ø = 80 mm and depth of cut a_p = 85 mm
You need: 1 bottom ring (BR) and
3 intermediate rings (ZR)

1 BR x 23.2 mm	23.2 mm
3 ZR x 22.0 mm	+ 66.0 mm
Total height rings	= 89.2 mm
X dimension*	+ 24.0 mm
Total length center screw	=113.2 mm
Always round up or off result	– 3.2 mm
Order length center screw	=110.0 mm

Always replace the two blanks in the article no. of the center screw matching the tool Ø (see table on the right) with the first two digits of the rounded total length – here 110 mm. The article number in this example is: 08Z.1611.6912

*Empirical value for optimal Multiring mounting

MULTIRING | CALCULATE TOTAL LENGTH **CM90 | EM90 | FM90** AND **MM90**

Assign diameter D to center screw and X dimension to calculate the total length of Multiring **CM90 | EM90 | FM90**

Tool Ø D in mm	Center screw Thread	Center screw Article	Tool length max. mm	Rings max. number	X-dimen. mm	1/2" inserts DIN6912	Allen tool DIN6912
32	M8	08Z.08_ _.6912	79	7	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

*Double cutting ring

Assign diameter D to center screw and X dimension to calculate the total length of Multiring **MM90**

Tool Ø D in mm	Center screw Thread	Center screw Article	Tool length max. mm	Rings max. number	X-dimen. mm	1/2" inserts DIN6912	Allen tool DIN6912
66	M12	08Z.12_ _.6912	174	9	20	GN 10-3	G 10
80	M14	08Z.14_ _.6912	193	10	21	GN 12-3	G 12
100	M16	08Z.16_ _.6912	193	10	24	GN 14-3	G 14

SCREWS | SCREWDRIVERS
TIGHTENING TORQUES

Torx fixing screws

Thread	Screw Article	Screw length mm	Screwdriver	Tightening torque Nm
M2.5	08B.25__.7991	up to 3.5	TX208	1.0
	08B.25__.7991	from 3.6	TX208	1.2
	08TP.25__.500	up to 3.5	TP7I1	1.2
	08TP.25__.501	from 3.6	TP7I1	1.2
M3.0	08B.03__.7991	up to 3.5	TX208	1.4
	08B.03__.7991	from 3.6	TX208	2.2
M3.5	08B.35__.7991	up to 4.0	TX215	2.2
	08B.35__.7991	from 4.1	TX215	3.3
M4.0	08B.04__.7991	–	TX215	5.0
M4.5	08B.45__.7991	–	TX220	7.0
M5.0	08B.05__.7991	–	TX220	8.5
M6.0	08B.06__.7991	up to 24	TX225	10.0
	08B.06__.7991	from 25	TX225	12.0

Double-threaded screws

Thread	Screw Article	Special feature	Screwdriver	Tightening torque Nm
M6	08Z.0000.093	Left-hand thread	TX215	4.5
M8	08Z.0000.242	–	TX225	8.0

Center screws

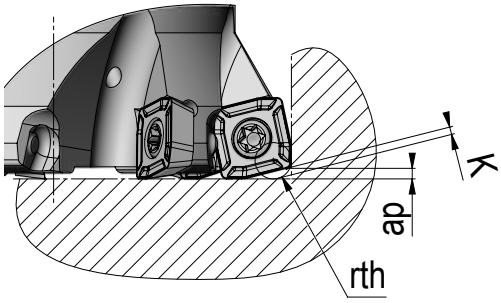
Thread	Screw Article	1/2" inserts DIN6912	Allen tool DIN6912	Tightening torque Nm
M8	08Z.08_ _.6912	GN 6-3	G 6	50
M12	08Z.12_ _.6912	GN 10-3	G 10	90
M14	08Z.14_ _.6912	GN 12-3	G 12	115
M16	08Z.16_ _.6912	GN 14-3	G 14	170
M20	08Z.20_ _.6912	GN 17-3	G 17	250
M24	08Z.24_ _.6912	–	G 19	580

Max. tightening torque for Torx screwdriver

Screwdriver	Tightening torque Nm	Screwdriver	Tightening torque Nm
TP7I1	max. 1.6	TX215	max. 8.5
TX208	max. 1.6	TX225	max. 12.0
TX220	max. 5.5		

USER INFORMATION
THEORETICAL CORNER RADIUS

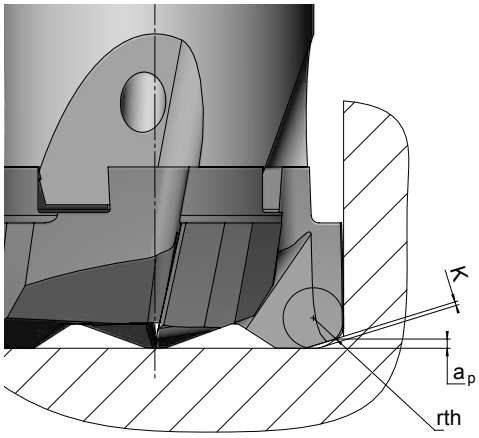
UD90



A **deviation from the final contour** occurs when **programming the theoretical corner radius**.

INS	Theoretical corner radius rth	Depth of cut a_p	Non-machined amount K
UD.0602..	1.5	1.0	0.7
UD.0803..	2.1	1.3	0.8
UD.10T3..	2.5	1.7	1.0
UD.1204..	2.5	2.0	1.3
UD.1606..	3.8	3.0	2.0

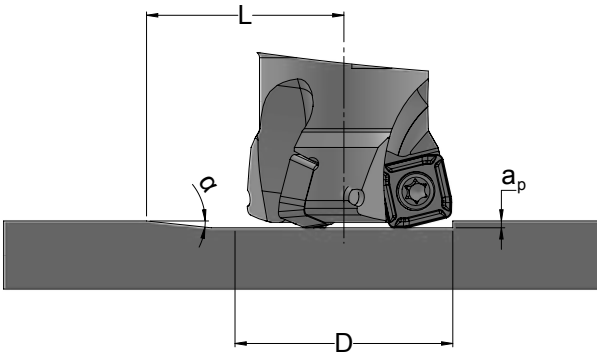
SP18



INS	Theoretical corner radius rth	Depth of cut a_p	Non-machined amount K
ECK 161210 TR-25	2.0	0.8	0.26
ECK 201210 TR-28	2.5	0.75	0.29
ECK 251210 TR-25	2.0	0.8	0.26
ECK 251210 TR-28	2.5	0.8	0.41

USER INFORMATION
RAMP

Dependence of ramp angle α and maximum depth of cut a_p



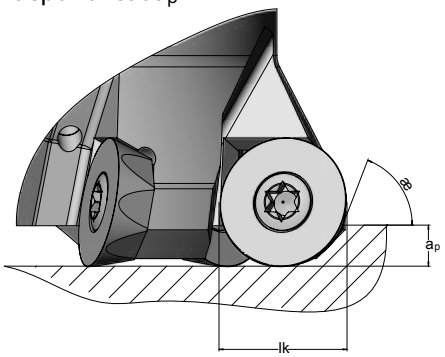
Maximum ramp angle α depends on the tool system's maximum depth of cut a_p.

Use max. 60% of the calculated feed rate when machining the ramp. Always start machining with a lower value.

In case of helical milling, the feed rate per revolution must not exceed the tool system's maximum depth of cut a_p.

ADAPTATION OF f_z AT DIFFERENT a_p VALUES

Dependence of setting angle æ and depth of cut a_p



When increasing depth of cut ap for milling cutters with round indexable inserts, please make sure to adjust feed rate f_z accordingly.

In case of round indexable inserts, chip thickness h_{max} and the resulting setting angle æ both depend on depth of cut a_p.

Adaptation of f_z at different a_p values

INS	a_p	0.5	1	1.5	2	2.5	3	3.5	4	5	6	7	8
RD..10T3...	f_z	2.00	1.50	1.25	1.10	1.00	0.95	0.90	0.85	0.90	–	–	–
RD..1204...	f_z	2.10	1.50	1.30	1.15	1.10	1.00	0.95	0.90	0.85	0.85	–	–
RD..1605...	f_z	2.40	1.80	1.50	1.30	1.20	1.10	1.05	1.00	0.95	0.90	0.85	0.85

USER INFORMATION
PROBLEM – RECOMMENDATION

Problems during cutting	Recommendations
Built-up edges	Increase cutting speed
	Use a more positive geometry
	Use cooling lubricant
Chipping at the cutting edge	Increase cutting speed
	Use a tougher grade
	Use a stronger and more stable cutting edge
	Adjust parameters
	Increase stability
Fatigue cracks along the flank	Use tougher hard metal grades
	Reduce feed rate
	Use different grade geometries
	Change the tool's entering and leaving of the material
Flank wear	Use more wear-resistant hard metal grades
	Reduce cutting speed
	Increase feed rate per tooth
Thermal cracks	Do not use cooling lubricants
	Use tougher material grades
	Reduce feed rate
Plastic deformation	Reduce cutting speed
	Reduce feed rate
	Use more wear-resistant hard metal grades
Poor surface quality	Choose additional special purpose geometry – W/S
	Increase cutting speed
	Reduce feed rate
Vibrations	Choose additional special purpose geometry – W
	Increase feed rate
	Alter milling position

INDEX
TOOLS

INDEX
TOOLS

INDEX
TOOLS

INDEX
INDEXABLE INSERTS

INDEX
INDEXABLE INSERTS

INDEX
INDEXABLE INSERTS

AVANTEC

First comes the solution.
Then our tool.
And then your success.

AVANTEC Zerspantechnik GmbH
Wilhelmstraße 123 | 75428 Illingen | Deutschland
T +49 7042 8222-0 | info@avantec.de | avantec.de

Italy AVANTEC Italy S.r.l.
Via Gramsci 157 | 24069 Trescore Balneario (BG)
T +39 035 4258369 | avantec-italy@avantec.de

USA AVANTEC USA, LLC
50 South Chestnut Street | Boyertown, PA 19512
T +1 610 473 2872 | avantec-usa@avantec.de

Austria AVANTEC Austria GmbH
Knoppen 93 | 8984 Bad Mitterndorf
T +43 3624 27915 | avantec-austria@avantec.de

China AVANTEC (Shanghai) Trading Co., Ltd.
Room 753A, Tower 3, German Centre
No. 88 Keyuan Rd. | Pudong 201203 Shanghai
T +86 21 68782268 | avantec-china@avantec.de

Indexable Inserts | Broaching tools | Shell End Mills | Face Milling Cutters Side Milling Cutters | Copy Milling Cutters | High Feed Cutters | Shoulder Milling Cutters | Shank End Mills | T-Slot Milling Cutters | Circular Milling Cutters | Programs Avant Easy Change and Triloc