

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/filigrée work pieces.

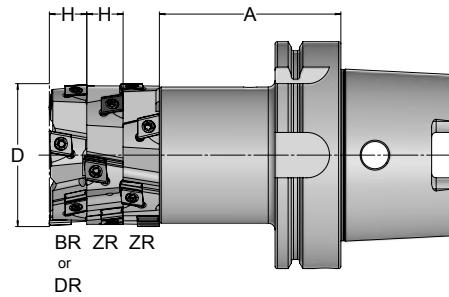
The AVANTEC Original

# 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	-	-	-	-	-	-

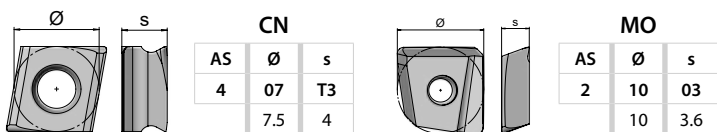
Tool holders CM90 Ø 40 mm not compatible with tool holders EM90 Ø 40 mm. Other dimensions upon request

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

D	ZR Article	H	Z <sub>eff</sub>	BR Article	H	Z <sub>eff</sub>	INS Designation	Qty.	DR Article	H	Z <sub>eff</sub>	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





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 100310TR-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 NERO <sup>2</sup> 77	$h_{max}$	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 NERO <sup>2</sup> 77	$h_{max}$	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 100310TR-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

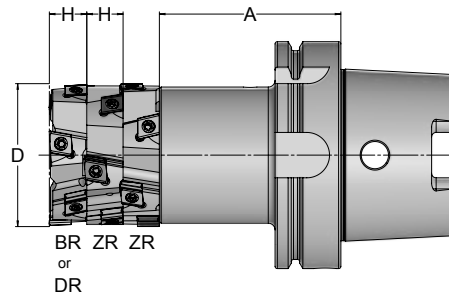
INS		
CN..07T3...	08B.0375.7991	TX208
MO..1003...	08B.0375.001	TX208

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	-	-	-

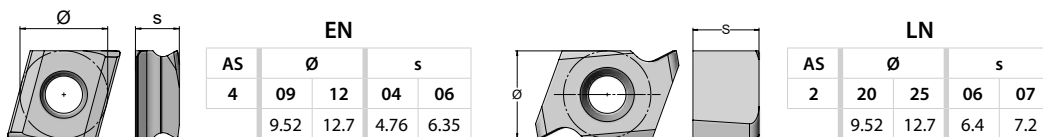
### Intermediate rings ZR | bottom rings BR | double cutting rings DR EM90

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

Other dimensions upon request

Mounting | ZR/BR/DR page 139  
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# INS SHAPE EN | LN

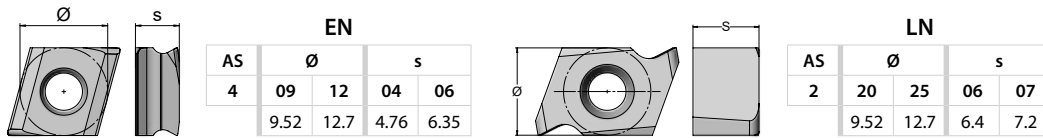


Matching of machining parameters  
with the AV material groups

Article	Designation	Recomm. $a_e$ $0.2 \times D$	Steel						
			A22	A21	A20	A19	A18	A17	A16
EN..0904..	EN.0904.017.26 SKY77	$h_{max}$	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	$h_{max}$	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	$h_{max}$	-	-	-	-	0.12	0.11	0.10
		$v_c$	-	-	-	-	140-180	110-140	80-110
	EN.0904.002.55 SKY77	$h_{max}$	-	-	-	-	0.12	0.11	0.10
		$v_c$	-	-	-	-	140-180	110-140	80-110
EN..1206..	EN.1206.027.18 SKY77	$h_{max}$	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	$h_{max}$	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	$h_{max}$	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	$h_{max}$	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	$h_{max}$	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	$h_{max}$	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	$h_{max}$	-	-	-	-	0.12	0.11	0.10
		$v_c$	-	-	-	-	140-180	110-140	80-110
EN.1206.002.55 SKY77	$h_{max}$	-	-	-	-	0.12	0.11	0.10	
	$v_c$	-	-	-	-	140-180	110-140	80-110	
LN..2007..	LN.2007.009.03 SKY77	$h_{max}$	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	$h_{max}$	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

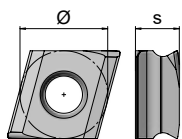


Matching of machining parameters with the AV material groups

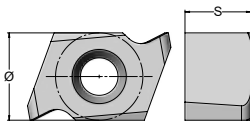
Article	Designation	Recomm. $a_e$ 0.2 x D	Cast iron						
			D21	D20	D19	D18	D17	D16	
EN..0904..	EN.0904.017.26 SKY77 ENHQ 090408 SL-28V	$h_{max}$	0.18	0.18	0.16	0.14	0.11	0.10	
		$v_c$	200-280	200-260	180-230	170-210	160-190	140-180	
	EN.0904.017.26 NERO26 ENHQ 090408 SL-28V	$h_{max}$	0.18	0.18	0.16	0.14	0.11	0.10	
		$v_c$	240-300	240-300	220-260	200-240	180-210	140-180	
EN..0904..	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..	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..	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..	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. $a_e$ $0.2 \times D$	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

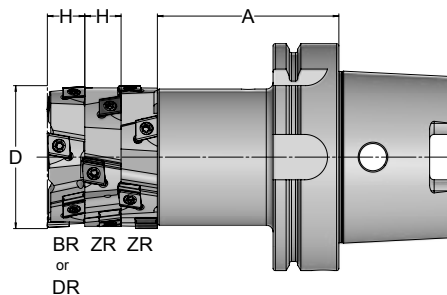
EN..0904...	08B.3511.7991	TX215
EN..1206...	08B.0513.7991	TX220
LN..2007...	08B.3511.7991	TX215
LN..2506...	08B.4511.7991	TX220

Mounting | CN/EN/FN  
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# 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

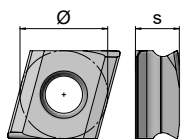
D	ZR Article	H	Z <sub>eff</sub>	BR Article	H	Z <sub>eff</sub>	INS Article	Qty.	DR Article	H	Z <sub>eff</sub>	INS Article	Qty.	Weight per ring in kg
45	12F.4513.021	13	3	12F.4513.022	13.5	3	FNHQ08T300.R FNHQ08T306.L	3 3	-	-	-	-	-	< 0.5
50	12F.5015.021	14.2	3	12F.5015.022	15.5	3	FNHQ08T300.R FNHQ08T306.L	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

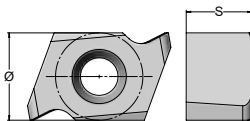
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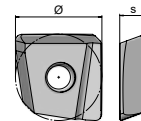
# INS SHAPE FN | LN | MO



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



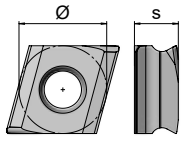
MO		
AS	Ø	s
2	10	03
	10	3.6

Matching of machining parameters  
with the AV material groups

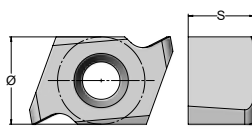
	Article	Designation	Recomm. $a_e$ $0.2 \times D$	Steel						
				A22	A21	A20	A19	A18	A17	A16
FN..08T3..	FN.08T3.004.09 SKY77	FNHQ 08T306 SL-28V	$h_{max}$	0.17	0.17	0.17	0.15	0.14	0.12	–
			$v_c$	200-280	190-230	180-220	160-210	140-180	110-140	–
	FN.08T3.005.10 SKY77	FNHQ 08T300 SR-28V	$h_{max}$	0.17	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

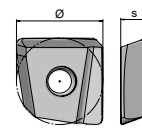
# INS SHAPE FN | LN | MO



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..	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

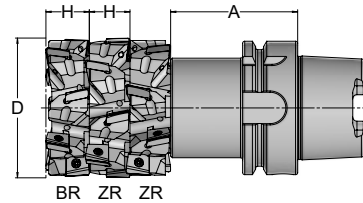
Mounting | CN/EN/FN  
indexable insert page 138



# 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		HSK-A63			HSK-A100		
	A	kg	A	kg	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
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
100	09A.5080.025	100	5.35	-	-	-	-	-

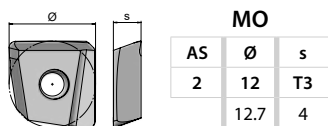
### Intermediate rings ZR | bottom rings BR MM90

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

Other dimensions upon request

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

# INS SHAPE MO



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..	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..	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

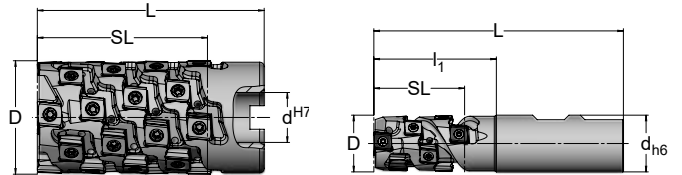
Article	Designation	Recomm. $a_e$ 0.2 x D	Stainless steels				NF metals		
			C12	C11	C10	C09	E82	E81	E80
MO..12T3..	MO.12T3.082.01 SKY77 MOGU 12T310 TL-28	$h_{max}$	-	-	-	-	0.25	0.23	0.20
		$v_c$	-	-	-	-	280-450	250-350	250-350
	MO.12T3.082.01 AV1077 MOGU 12T310 TL-28	$h_{max}$	0.12	0.10	0.08	-	0.25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

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	dh6	L	l <sub>1</sub>	SL	zz	z <sub>eff</sub>	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

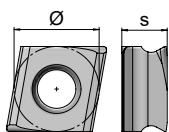
CW90 Plug-in milling cutters										
Article	D	dh7	L	SL	zz	z <sub>eff</sub>	lc	kg	INS	
02C.5010.001	50	22	100	75	32	4	yes	1.45	CN..1005.L	
02C.6313.001	63	32	130	94.5	40	4	yes	2.49	CN..1005.L	
02C.8011.001	80	32	110	85	45	5	yes	3.54	CN..1005.L	

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

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## 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

				Steel						
Article		Designation		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

				Cast iron					
Article		Designation		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 NERO <sup>2</sup> 77	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 CAN <sup>2</sup> 77	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

				Stainless steels				NF metals		
Article		Designation		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