

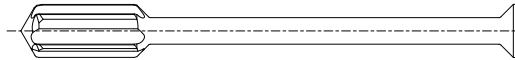
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# Deburring Tools

## NCC-60

### Chamfering milling cutters

P M K N



Unit: mm

Specification	Dimensions				
	d	D	L	L1	
NCC-D0460	4	4	50	3.5	4
NCC-D0660	6	6	57	5.2	4
NCC-D0860	8	8	63	7.0	4
NCC-D1060	10	10	72	8.7	4
NCC-D1260	12	12	83	10.4	4

### Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			Chamfering			ap/ae max = 0,25 x D			
P	≤ 850 N/mm <sup>2</sup>	192	0.018	0.036	0.048	0.06	0.08	0.10	0.13
	≥ 850 N/mm <sup>2</sup>	140	0.016	0.032	0.042	0.06	0.07	0.09	0.12
M	≤ 750 N/mm <sup>2</sup>	120	0.013	0.025	0.034	0.05	0.05	0.07	0.09
	≥ 750 N/mm <sup>2</sup>	80	0.009	0.019	0.025	0.04	0.04	0.06	0.07
K	≤ 240 HB	170	0.017	0.033	0.044	0.06	0.07	0.09	0.12
N	≥ 7% Si	250	0.023	0.047	0.062	0.08	0.10	0.13	0.17

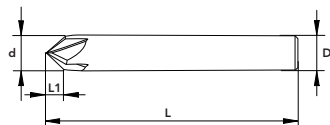
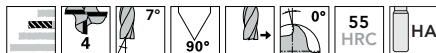
ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			De-burring			ap/ae max = 0,05 x D			
P	≤ 850 N/mm <sup>2</sup>	250	0.030	0.060	0.080	0.11	0.13	0.17	0.21
	≥ 850 N/mm <sup>2</sup>	180	0.026	0.053	0.070	0.10	0.12	0.16	0.20
M	≤ 750 N/mm <sup>2</sup>	160	0.021	0.042	0.056	0.08	0.09	0.12	0.15
	≥ 750 N/mm <sup>2</sup>	100	0.016	0.032	0.042	0.06	0.07	0.10	0.12
K	≤ 240 HB	230	0.028	0.056	0.074	0.10	0.12	0.16	0.20
N	≥ 7% Si	330	0.039	0.078	0.104	0.14	0.17	0.22	0.28



## NCC-90

### Chamfering milling cutters

P M K N



Unit: mm

Specification	Dimensions				
	d	D	L	L1	
NCC-D0490	4	4	50	2	4
NCC-D0690	6	6	57	3	4
NCC-D0890	8	8	63	4	4
NCC-D1090	10	10	72	5	4
NCC-D1290	12	12	83	6	4

### Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			Chamfering			ap/ae max = 0,25 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	192	0.018	0.036	0.048	0.06	0.08	0.10	0.13
	≥ 850 N/mm <sup>2</sup>	140	0.016	0.032	0.042	0.06	0.07	0.09	0.12
<b>M</b>	≤ 750 N/mm <sup>2</sup>	120	0.013	0.025	0.034	0.05	0.05	0.07	0.09
	≥ 750 N/mm <sup>2</sup>	80	0.009	0.019	0.025	0.04	0.04	0.06	0.07
<b>K</b>	≤ 240 HB	170	0.017	0.033	0.044	0.06	0.07	0.09	0.12
<b>N</b>	≥ 7% Si	250	0.023	0.047	0.062	0.08	0.10	0.13	0.17

ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			De-burring			ap/ae max = 0,05 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	250	0.030	0.060	0.080	0.11	0.13	0.17	0.21
	≥ 850 N/mm <sup>2</sup>	180	0.026	0.053	0.070	0.10	0.12	0.16	0.20
<b>M</b>	≤ 750 N/mm <sup>2</sup>	160	0.021	0.042	0.056	0.08	0.09	0.12	0.15
	≥ 750 N/mm <sup>2</sup>	100	0.016	0.032	0.042	0.06	0.07	0.10	0.12
<b>K</b>	≤ 240 HB	230	0.028	0.056	0.074	0.10	0.12	0.16	0.20
<b>N</b>	≥ 7% Si	330	0.039	0.078	0.104	0.14	0.17	0.22	0.28

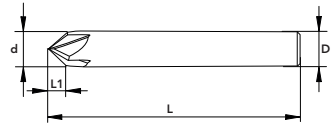
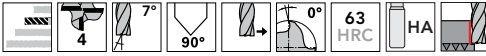


# Deburring Tools

## NCC-DH-90

### Chamfering milling cutters

**P K H**



Unit: mm

Specification	Dimensions				
	d	D	L	L1	
NCC-DH0490	4	4	50	2	4
NCC-DH0690	6	6	57	3	4
NCC-DH0890	8	8	63	4	4
NCC-DH1090	10	10	72	5	4
NCC-DH1290	12	12	83	6	4

### Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			Chamfering			ap/ae max = 0,25 x D			
<b>P</b>	≥ 850 N/mm <sup>2</sup>	140	0.016	0.032	0.042	0.06	0.07	0.09	0.12
<b>K</b>	≥ 240 HB	150	0.014	0.028	0.037	0.05	0.06	0.08	0.10
<b>H</b>	≤ 55 HRC	50	0.010	0.020	0.026	0.04	0.04	0.06	0.07
	55 - 63 HRC	40	0.013	0.025	0.034	0.05	0.05	0.07	0.09

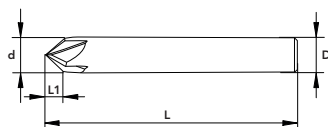
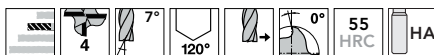
ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			De-burring			ap/ae max = 0,05 x D			
<b>P</b>	≥ 850 N/mm <sup>2</sup>	180	0.026	0.053	0.070	0.10	0.12	0.16	0.20
<b>K</b>	≥ 240 HB	190	0.023	0.047	0.062	0.08	0.10	0.13	0.17
<b>H</b>	≤ 55 HRC	70	0.017	0.033	0.044	0.06	0.07	0.10	0.12
	55 - 63 HRC	60	0.021	0.042	0.056	0.08	0.09	0.12	0.15



## NCC-120

### Chamfering milling cutters

**P M K N**



Unit: mm

Specification	Dimensions				
	d	D	L	L1	
NCC-D04120	4	4	50	1.2	4
NCC-D06120	6	6	57	1.8	4
NCC-D08120	8	8	63	2.4	4
NCC-D10120	10	10	72	2.9	4
NCC-D12120	12	12	83	3.5	4

### Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			Chamfering			ap/ae max = 0,25 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	192	0.018	0.036	0.048	0.06	0.08	0.10	0.13
	≥ 850 N/mm <sup>2</sup>	140	0.016	0.032	0.042	0.06	0.07	0.09	0.12
<b>M</b>	≤ 750 N/mm <sup>2</sup>	120	0.013	0.025	0.034	0.05	0.05	0.07	0.09
	≥ 750 N/mm <sup>2</sup>	80	0.009	0.019	0.025	0.04	0.04	0.06	0.07
<b>K</b>	≤ 240 HB	170	0.017	0.033	0.044	0.06	0.07	0.09	0.12
<b>N</b>	≥ 7% Si	250	0.023	0.047	0.062	0.08	0.10	0.13	0.17

ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			De-burring			ap/ae max = 0,05 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	250	0.030	0.060	0.080	0.11	0.13	0.17	0.21
	≥ 850 N/mm <sup>2</sup>	180	0.026	0.053	0.070	0.10	0.12	0.16	0.20
<b>M</b>	≤ 750 N/mm <sup>2</sup>	160	0.021	0.042	0.056	0.08	0.09	0.12	0.15
	≥ 750 N/mm <sup>2</sup>	100	0.016	0.032	0.042	0.06	0.07	0.10	0.12
<b>K</b>	≤ 240 HB	230	0.028	0.056	0.074	0.10	0.12	0.16	0.20
<b>N</b>	≥ 7% Si	330	0.039	0.078	0.104	0.14	0.17	0.22	0.28

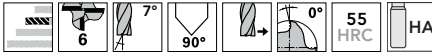


# Deburring Tools

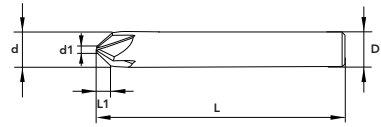
## NCC-E-90

### Chamfering milling cutters

**P M K N**



•Face cutting  
•Without centre cutting



Unit: mm

Specification	Dimensions					
	d	d1	D	L	L1	
NCC-E0690	6	1.5	6	57	2.25	6
NCC-E0890	8	2.0	8	63	3.00	6
NCC-E1090	10	3.0	10	72	3.50	6
NCC-E1290	12	3.0	12	83	4.50	6
NCC-E1690	16	4.0	16	92	6.00	6
NCC-E2090	20	6.0	20	92	7.00	6

### Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			Chamfering			ap/ae max = 0,25 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	192	0.018	0.036	0.048	0.06	0.08	0.10	0.13
	≥ 850 N/mm <sup>2</sup>	140	0.016	0.032	0.042	0.06	0.07	0.09	0.12
<b>M</b>	≤ 750 N/mm <sup>2</sup>	120	0.013	0.025	0.034	0.05	0.05	0.07	0.09
	≥ 750 N/mm <sup>2</sup>	80	0.009	0.019	0.025	0.04	0.04	0.06	0.07
<b>K</b>	≤ 240 HB	170	0.017	0.033	0.044	0.06	0.07	0.09	0.12
<b>N</b>	≥ 7% Si	250	0.023	0.047	0.062	0.08	0.10	0.13	0.17

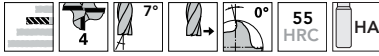
ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
			De-burring			ap/ae max = 0,05 x D			
<b>P</b>	≤ 850 N/mm <sup>2</sup>	250	0.030	0.060	0.080	0.11	0.13	0.17	0.21
	≥ 850 N/mm <sup>2</sup>	180	0.026	0.053	0.070	0.10	0.12	0.16	0.20
<b>M</b>	≤ 750 N/mm <sup>2</sup>	160	0.021	0.042	0.056	0.08	0.09	0.12	0.15
	≥ 750 N/mm <sup>2</sup>	100	0.016	0.032	0.042	0.06	0.07	0.10	0.12
<b>K</b>	≤ 240 HB	230	0.028	0.056	0.074	0.10	0.12	0.16	0.20
<b>N</b>	≥ 7% Si	330	0.039	0.078	0.104	0.14	0.17	0.22	0.28



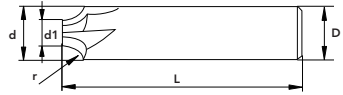
## QMC

### Quadrant milling cutters

P M K N



•Without centre cutting



Unit: mm

Specification	Dimensions					
	d	r	D	d1	L	
QMC-d6R05	6	0.5	6	5	50	4
QMC-d6R10	6	1.0	6	4	50	4
QMC-d8R15	8	1.5	8	5	58	4
QMC-d10R20	10	2.0	10	6	66	4
QMC-d10R25	10	2.5	10	5	66	4
QMC-d12R30	12	3.0	12	6	73	4
QMC-d14R35	14	3.5	14	7	75	4
QMC-d14R40	14	4.0	14	6	75	4
QMC-d16R45	16	4.5	16	7	76	4
QMC-d16R50	16	5.0	16	6	76	4
QMC-d20R55	20	5.5	20	9	92	4
QMC-d20R60	20	6.0	20	8	92	4

Recommended cutting data see next page



## Cutting Data



ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
<b>P</b>	≤ 850 N/mm <sup>2</sup>	140	0.014	0.028	0.037	0.048	0.06	0.08	0.10
	≥ 850 N/mm <sup>2</sup>	110	0.012	0.024	0.032	0.045	0.05	0.07	0.09
<b>M</b>	≤ 750 N/mm <sup>2</sup>	100	0.010	0.019	0.026	0.035	0.04	0.06	0.07
	≥ 750 N/mm <sup>2</sup>	70	0.008	0.015	0.020	0.029	0.03	0.05	0.06
<b>K</b>	≤ 240 HB	130	0.013	0.026	0.034	0.045	0.05	0.07	0.09
<b>N</b>	≥ 7% Si	190	0.018	0.036	0.048	0.064	0.08	0.10	0.13

## Cutting Data



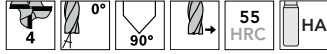
ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
<b>P</b>	≤ 850 N/mm <sup>2</sup>	240	0.013	0.026	0.035	0.046	0.06	0.07	0.09
	≥ 850 N/mm <sup>2</sup>	180	0.012	0.023	0.031	0.043	0.05	0.07	0.09
<b>M</b>	≤ 750 N/mm <sup>2</sup>	160	0.009	0.018	0.025	0.033	0.04	0.05	0.07
	≥ 750 N/mm <sup>2</sup>	100	0.006	0.013	0.017	0.024	0.03	0.04	0.05
<b>K</b>	≤ 240 HB	220	0.012	0.024	0.033	0.043	0.05	0.07	0.09
<b>N</b>	≥ 7% Si	320	0.017	0.034	0.046	0.062	0.07	0.10	0.12



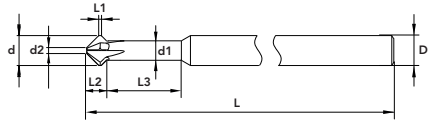
## FBD

### Front/back deburrer 90°

P M K N S H



- Neck clearance <math>\varnothing 6.0\text{ mm}</math>
- Without centre cutting



Unit: mm

Specification	Dimensions								
	d	D	d1	d2	L	L1	L2	L3	
FBD-d390	3	4	2.2	0.6	75	2.1	5	9.3	4
FBD-d490	4	4	2.9	0.8	75	2.7	6	12.3	4
FBD-d590	5	5	3.9	1.0	75	3.0	7	15.0	4
FBD-d690	6	6	3.9	1.2	100	3.9	8	14.3	4
FBD-d890	8	6	6.0	1.6	100	4.7	12	/	4
FBD-d1090	10	6	6.0	2.0	100	6.5	12	/	4
FBD-d1290	12	6	6.0	2.4	100	8.3	13	/	4

## Cutting Data

ISO	Hardness	VC	$f_z \text{ (mm/z) } / \varphi$						
			3	6	8	10	12	16	20
P	$\leq 850 \text{ N/mm}^2$	180	0.08	0.12	0.20	0.20	0.25	0.25	0.25
	$\geq 850 \text{ N/mm}^2$	150	0.06	0.10	0.15	0.15	0.20	0.20	0.20
M	$\leq 750 \text{ N/mm}^2$	100	0.06	0.10	0.15	0.15	0.20	0.20	0.20
	$\geq 750 \text{ N/mm}^2$	80	0.05	0.08	0.12	0.12	0.15	0.15	0.15
K	$\leq 350 \text{ HB}$	120	0.08	0.12	0.20	0.20	0.25	0.25	0.25
N	$\leq 3\% \text{ Si}$	200	0.10	0.15	0.25	0.25	0.30	0.30	0.30
	$> 3\% \text{ Si}$	150	0.08	0.12	0.20	0.20	0.25	0.25	0.25
S	$\leq 850 \text{ N/mm}^2$	60	0.05	0.08	0.12	0.12	0.15	0.15	0.15
	$\leq 1400 \text{ N/mm}^2$	40	0.04	0.06	0.10	0.10	0.12	0.12	0.12
H	$< 55 \text{ HRC}$	100	0.06	0.10	0.15	0.15	0.20	0.20	0.20
	$\leq 63 \text{ HRC}$	40	0.04	0.05	0.06	0.06	0.08	0.08	0.08



## NDR

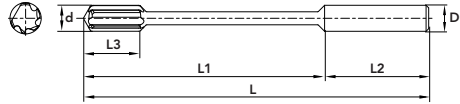
### Deburring reamers

**P M K N S**

DIN  
6535



- Deburring without damage to the bore surface
- Short process times due to low feed rate
- Minimum cooling pressure 15 bar



Unit: mm

Specification	Dimensions					
	d	D	L	L1	L2	L3
NDR-d2.97	2.97	4	101	73	28	12.7
NDR-d3.97	3.97	4	101	73	28	13.0
NDR-d4.97	4.97	6	121	85	36	13.3
NDR-d5.97	5.97	6	121	85	36	13.6
NDR-d7.97	7.97	8	132	96	36	18.1
NDR-d9.97	9.97	10	132	92	40	21.7
NDR-d11.97	11.97	12	133	88	45	19.0

### Cutting Data

ISO	Hardness	VC	fz (mm/z) / φ						
			3	6	8	10	12	16	20
<b>P</b>	≤ 850 N/mm <sup>2</sup>	150	0.03	0.05	0.05	0.05	0.05	0.05	0.05
	≥ 850 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.03	0.03	0.03	0.03
<b>M</b>	≤ 750 N/mm <sup>2</sup>	120	0.03	0.05	0.05	0.05	0.05	0.05	0.05
	≥ 750 N/mm <sup>2</sup>	100	0.03	0.03	0.03	0.03	0.03	0.03	0.03
<b>K</b>	≤ 350 HB	150	0.05	0.05	0.05	0.05	0.05	0.05	0.05
<b>N</b>	≤ 3% Si	150	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	> 3% Si	150	0.05	0.05	0.05	0.05	0.05	0.05	0.05
<b>S</b>	/	100	0.03	0.03	0.03	0.03	0.03	0.03	0.03





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