



Counterboring, countersinking, chamfering and facing

# HY-PRO-CARB

Volume 1.1



# KEY FEATURES: HY-PRO-CARB



**1** Indexable tool for a variety of applications and work materials.

**2** For boring pre-drilled holes, chamfering, countersinking, facing, etc.

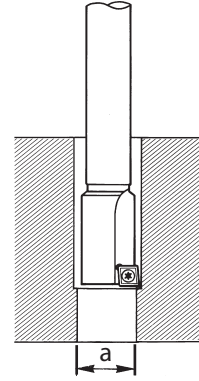
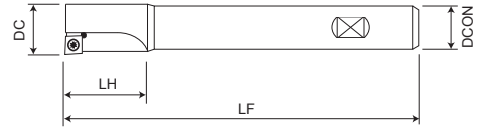
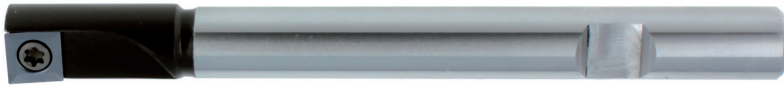
**3** Straight steel shank with Weldon flat, DIN 1835B.

**4** Also with internal coolant supply.



# HY-PRO-CARB

## Drilling | Boring Tool



- With steel shank, Weldon flat, DIN 1835B
- For boring pre-drilled and precast holes

EDP	DC	a (min)	LF	LH	ZFFP	DCON	Price
490300980	9,8	9,3	85	20	1	8	
490301080	10,8	10,3	95	20	1	10	
490301180	11,8	11,3	100	25	1	10	
490301280	12,8	12,3	105	30	1	10	
490301380	13,8	13,3	110	35	1	10	
490301480	14,8	14,3	120	30	1	12	
490301580	15,8	15,3	125	35	1	12	
490301680	16,8	15,8	133	30	1	16	
490301780	17,8	16,8	138	35	1	16	
490301880	18,8	17,8	143	40	1	16	
490301980	19,8	18,8	148	45	1	16	
490302080	20,8	19,8	153	50	1	16	
490302180	21,8	20,8	158	55	1	16	

Note: Insert screws included with cutter body. Torx driver to be purchased separately.

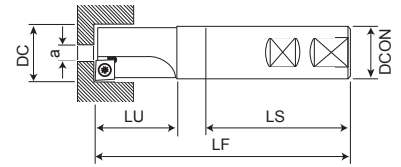


EDP	Designation	Material	Grade	P		M		K		N		S		H	
				dry	water	dry	water	GG	GGG	dry	water	dry	water	dry	water
413200013	MPHT 060202.N12	Carbide	PMK92	●	●	○	○	○	○						
413200014	MPHT 060202.N13	Carbide	CH1	●	●	○	○	○	○	●					
413200015	MPHT 060202.N14	Carbide	PMK92	●	●	●	●	○	○						
413200016	MPHW 060202.N15	Cermet	CT50	○	○	○	○	○	○						
413200017	MPHW 060202.N15	Cermet	CT53	○	○	○	○	○	○						

matching cutter body Ø	Torx® screwdriver	Replacement screw
Ø 9,8 - 21,8	7808205	T8
		423300002
		M2,5 x 4,5

# HY-PRO-CARB

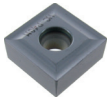
## Drilling | Counterbore «mono»



- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B

EDP	DC	a (min)	LF	LU	LS	ZEFP	DCON	Price
490370800	8	4	80	23	45	1	12	
490370900	9	4	80	23	45	1	12	
490371000	10	4	80	23	45	1	12	
490371100	11	4	80	23	45	1	12	
490371200	12	4	80	26	45	1	12	
490371300	13	5	80	26	45	1	12	
490371400	14	5	80	26	45	1	12	
490371500	15	5	80	26	45	1	12	
490371600	16	5	90	31	48	1	16	
490371700	17	6	90	31	48	1	16	
490371800	18	8	90	31	48	1	16	
490371900	19	8	90	31	48	1	16	
490372000	20	5	100	36	50	1	20	

Note: Insert screws included with cutter body. Torx driver to be purchased separately.

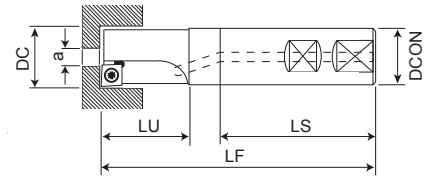


EDP	matching cutter body Ø	Designation	Material	Grade	P		M		K		N		S		H	
					dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
413200013	Ø 8 - 19	MPHT 060202.N12	Carbide	PMK92	●	●	○	○	○	○						
413200014		MPHT 060202.N13	Carbide	CH1			○	○			●					
413200015		MPHT 060202.N14	Carbide	PMK92	●	●	○	○								
413200016		MPHW 060202.N15	Cermet	CT50	○	○			●	○						
413200017		MPHW 060202.N15	Cermet	CT53	○	○			○	●						
413200020		MPMT 060204.N12	Carbide	PMK92	●	●										
413200018		MPMT 060204.N12	Carbide	CH1					●	○						
413200019		MPMT 060204.N12	Carbide	KM22					○	●						
413200007		MCHT 09T304.N12	Carbide	PMK92	●	●	○	○	○	○						
413200008		MCHT 09T304.N13	Carbide	CH1			○	○			●					
413200009	MCHT 09T304.N14	Carbide	PMK92			●	●									
413200012	MCMT 09T308.N12	Carbide	PMK92	●	●											
413200010	MCMT 09T308.N12	Carbide	CH1					●	○							
413200011	MCMT 09T308.N12	Carbide	KM22					○	●							

matching cutter body Ø	Torx® screwdriver	Replacement screw
Ø 8 - 19	7808205 T8	423300002 M2,5 x 4,5
Ø 20	7808208 T15	423300003 M4x 7,5

# HY-PRO-CARB

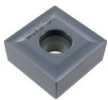
## Drilling | Counterbore «mono»



- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B.
- With internal coolant supply

EDP	DC	a (min)	LF	LU	LS	ZEFP	DCON	Price
490381000	10	4	80	23	45	1	12	
490381100	11	4	80	23	45	1	12	
490381200	12	4	80	26	45	1	12	
490381300	13	5	80	26	45	1	12	
490381400	14	5	80	26	45	1	12	
490381500	15	5	80	26	45	1	12	
490381600	16	5	90	31	48	1	16	
490381700	17	6	90	31	48	1	16	
490381800	18	8	90	31	48	1	16	
490381900	19	8	90	31	48	1	16	
490382000	20	5	100	36	50	1	20	
490382100	21	5	100	36	50	1	20	
490382200	22	6	100	36	50	1	20	
490382300	23	6	100	36	50	1	20	
490382400	24	8	100	36	50	1	20	
490382500	25	8	120	43	56	1	25	
490382600	26	10	120	43	56	1	25	
490382700	27	10	120	43	56	1	25	
490382800	28	12	120	43	56	1	25	
490382900	29	12	120	43	56	1	25	
490383000	30	14	120	43	56	1	25	

Note: Insert screws included with cutter body. Torx driver to be purchased separately.

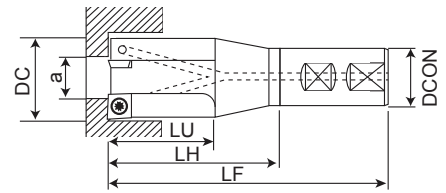


EDP	matching cutter body Ø	Designation	Material	Grade	P		M		K		N		S		H
					dry	water	dry	water	GG	GGG	dry	water	dry	water	dry
413200013	Ø 10 - 19	MPHT 060202.N12	Carbide	PMK92	●	●	○	○	○	○	○	○	○	○	○
413200014		MPHT 060202.N13	Carbide	CH1	○	○	○	○	○	○	○	○	○	○	○
413200015		MPHT 060202.N14	Carbide	PMK92	●	●	○	○	○	○	○	○	○	○	○
413200016		MPHW 060202.N15	Cermet	CT50	○	○	○	○	○	○	○	○	○	○	○
413200017		MPHW 060202.N15	Cermet	CT53	○	○	○	○	○	○	○	○	○	○	○
413200020		MPMT 060204.N12	Carbide	PMK92	●	●	○	○	○	○	○	○	○	○	○
413200018		MPMT 060204.N12	Carbide	CH1	○	○	○	○	○	○	○	○	○	○	○
413200019		MPMT 060204.N12	Carbide	KM22	○	○	○	○	○	○	○	○	○	○	○
413200007		MCHT 09T304.N12	Carbide	PMK92	●	●	○	○	○	○	○	○	○	○	○
413200008		MCHT 09T304.N13	Carbide	CH1	○	○	○	○	○	○	○	○	○	○	○
413200009	MCHT 09T304.N14	Carbide	PMK92	○	○	○	○	○	○	○	○	○	○	○	
413200012	Ø 20 - 30	MCMT 09T308.N12	Carbide	PMK92	●	●	○	○	○	○	○	○	○	○	○
413200010		MCMT 09T308.N12	Carbide	CH1	○	○	○	○	○	○	○	○	○	○	○
413200011		MCMT 09T308.N12	Carbide	KM22	○	○	○	○	○	○	○	○	○	○	○

matching cutter body Ø	Torx® screwdriver	Replacement screw
Ø 10 - 19	7808205	T8
Ø 20 - 30	7808208	T15

# HY-PRO-CARB

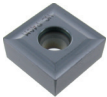
## Drilling | Counterbore «multi»





- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B.
- With internal coolant supply

EDP	DC	a (min)	LF	LH	LU	ZEFP	DCON	Price
490391500	15	4	100	40	30	2	20	
490391800	18	6	100	40	30	2	20	
490392000	20	8	100	40	30	2	20	
490392200	22	10	100	40	30	2	20	
490392400	24	6	136	68	50	2	25	
490392600	26	8	136	68	50	2	25	
490392800	28	10	136	68	50	2	25	
490393000	30	12	136	66	50	3	32	
490393300	33	15	136	66	50	3	32	
490393600	36	18	136	66	50	2	32	
490394000	40	16	136	66	50	3	32	

Note: Insert screws included with cutter body. Torx driver to be purchased separately.

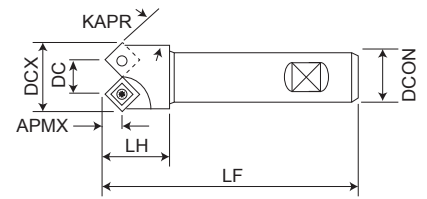
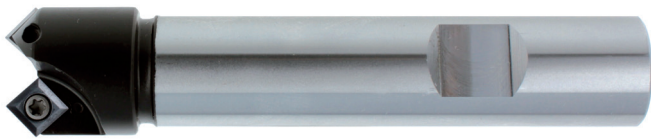


EDP	matching cutter body Ø	Designation	Material	Grade	P		M		K		N		S		H	
					dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
413200013	Ø 15 -22	MPHT 060202.N12	Carbide	PMK92	●	☉	☉	☉	☉	☉						
413200014		MPHT 060202.N13	Carbide	CH1			☉	☉			☉					
413200015		MPHT 060202.N14	Carbide	PMK92	●	☉	☉	☉								
413200016		MPHW 060202.N15	Cermet	CT50	☉	☉			☉	☉						
413200017		MPHW 060202.N15	Cermet	CT53	☉	☉			☉	☉						
413200020		MPMT 060204.N12	Carbide	PMK92	●	☉										
413200018		MPMT 060204.N12	Carbide	CH1					☉	☉						
413200019	MPMT 060204.N12	Carbide	KM22					☉	☉							
413200007	Ø 24 - 36	MCHT 09T304.N12	Carbide	PMK92	●	☉	☉	☉	☉	☉						
413200008		MCHT 09T304.N13	Carbide	CH1			☉	☉			☉					
413200009		MCHT 09T304.N14	Carbide	PMK92	●	☉	☉	☉								
413200012		MCMT 09T308.N12	Carbide	PMK92	●	☉										
413200010		MCMT 09T308.N12	Carbide	CH1					☉	☉						
413200011		MCMT 09T308.N12	Carbide	KM22					☉	☉						
413200001		Ø 40	MBHT 120404.N12	Carbide	PMK92	●	☉	☉	☉	☉	☉					
413200002	MBHT 120404.N13		Carbide	CH1			☉	☉			☉					
413200003	MBHT 120404.N14		Carbide	PMK92	●	☉	☉	☉								
413200006	MBMT 120408.N12		Carbide	PMK92	●	☉										
413200004	MBMT 120408.N12		Carbide	CH1					☉	☉						
413200005	MBMT 120408.N12		Carbide	KM22					☉	☉						

matching cutter body Ø	 Torx® screwdriver		 Replacement screw	
Ø 15 -22	7808205	T8	423300002	M2,5 x 4,5
Ø 24 - 36	7808208	T15	423300003	M4x 7,5
Ø 40	7808208	T15	423300004	M4x 9,5

# HY-PRO-CARB

Drilling | Chamfer and Face Milling Tool



- For chamfering, countersinking, facing, etc.
- Straight shank with Weldon flat, DIN 1835B

EDP	DCX	KAPR	DC	LF	APMX	LH	ZEFP	DCON	Price
491001345	13	45°	6	80	4	16	1	10	
491001915	19	15°	16	90	6	19	2	16	
491001930	19	30°	13	90	5,5	18	2	16	
491001945	19	45°	11	90	4	18	2	16	
491002645	26	45°	15	100	6	26	2	20	
491003260	32	60°	17,5	100	4	30	2	20	
491003275	32	75°	15,5	100	2	30	2	20	
491004015	40	15°	34	120	10	36	2	25	
491004030	40	30°	28	120	10,5	38	2	25	
491004045	40	45°	25	120	8	38	2	25	

Note: Insert screws included with cutter body. Torx driver to be purchased separately.

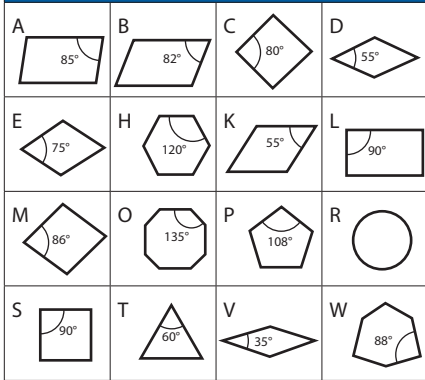


EDP	matching cutter body Ø	Designation	Material	Grade	P		M		K		N		S		H	
					dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
413200013	Ø 13 -19	MPHT 060202.N12	Carbide	PMK92	●	●	○	○	○	○						
413200014		MPHT 060202.N13	Carbide	CH1			○	○			●					
413200015		MPHT 060202.N14	Carbide	PMK92	●	●	●	●								
413200016		MPHW 060202.N15	Cermet	CT50	○	○			●	●						
413200017		MPHW 060202.N15	Cermet	CT53	○	○			○	○						
413200020		MPMT 060204.N12	Carbide	PMK92	●	●										
413200018		MPMT 060204.N12	Carbide	CH1					●	●						
413200019	MPMT 060204.N12	Carbide	KM22					●	●							
413200007	Ø 26 -32	MCHT 09T304.N12	Carbide	PMK92	●	●	○	○	○	○						
413200008		MCHT 09T304.N13	Carbide	CH1			○	○			●					
413200009		MCHT 09T304.N14	Carbide	PMK92			●	●								
413200012		MCMT 09T308.N12	Carbide	PMK92	●	●										
413200010		MCMT 09T308.N12	Carbide	CH1					●	●						
413200011		MCMT 09T308.N12	Carbide	KM22					●	●						
413200001		Ø 40	MBHT 120404.N12	Carbide	PMK92	●	●	○	○	○	○					
413200002	MBHT 120404.N13		Carbide	CH1			○	○			●					
413200003	MBHT 120404.N14		Carbide	PMK92			●	●								
413200006	MBMT 120408.N12		Carbide	PMK92	●	●										
413200004	MBMT 120408.N12		Carbide	CH1					●	●						
413200005	MBMT 120408.N12		Carbide	KM22					○	○						

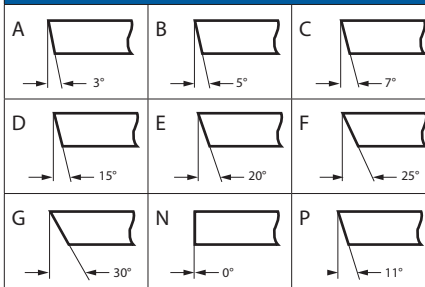
matching cutter body Ø	Torx® screwdriver	Replacement screw
Ø 13 -19	7808205	T8
Ø 26 -32	7808208	T15
Ø 40	7808208	T15

# ISO REFERENCE CODES FOR INSERTS

## 1 Insert shape



## 2 Clearance angle

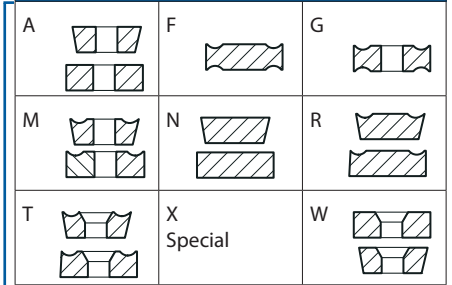


Sm	s	d
0,025	0,005	0,025
0,025	0,013	0,025
0,025	0,025	0,025
0,025	0,005	0,013
0,13	0,025	0,025
0,025	0,013	0,013
0,025	0,005	0,05-0,15*
0,025	0,013	0,05-0,15*
0,025	0,025	0,05-0,15*
0,08-0,20*	0,13	0,05-0,15*
0,13-0,38*	0,13	0,08-0,25*

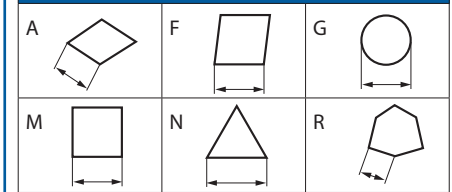
## Inserts Tolerances +/-

d	Class M		Class U	
	m	d	m	d
6,35	0,08	0,05	0,13	0,08
9,52	0,08	0,05	0,13	0,08
12,70	0,13	0,08	0,20	0,13
15,88	0,15	0,10	0,27	0,18
19,05	0,15	0,10	0,27	0,18

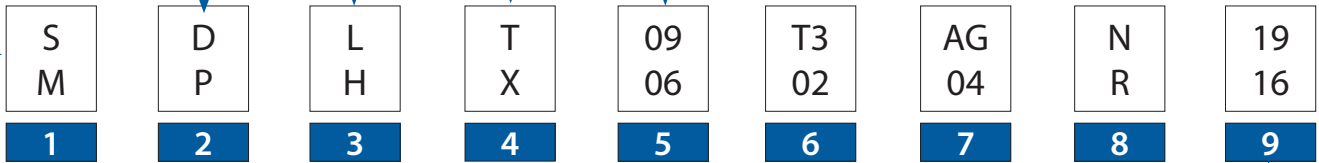
## 4 Fixing and geometry



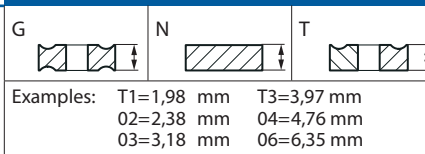
## 5 Length of main cutting edge



Examples: 04=4,760 mm 11=11,0 mm  
 06=6,350 mm 12=12,7 mm  
 07=7,0 mm 15=15,5 mm  
 08=7,940 mm 16=16,5 mm  
 09=9,525 mm 22=22,0 mm  
 etc.



## 6 Insert thickness



## 7 Corner radii

Radii	Chamfers first letter = \ between chamfer and cutting edge
	second letter = \ clearance at the chamfer
Examples 00=r 0 02=r 0,2mm 04=r 0,4mm 08=r 0,8mm 12=r 1,2mm 16=r 1,6mm 20=r 2,0mm	A=45° F=85° C= 7° F=25° D=60° P=90° D=15° G=30° E=75° E=20°

## 8 Direction of cut



## 8+9 Turning

N 50		N 56	
N 51		N 58	
L/R/N 52			
L/R 53			
L/R/N 54			
N 55			

## 9 Chip breaker

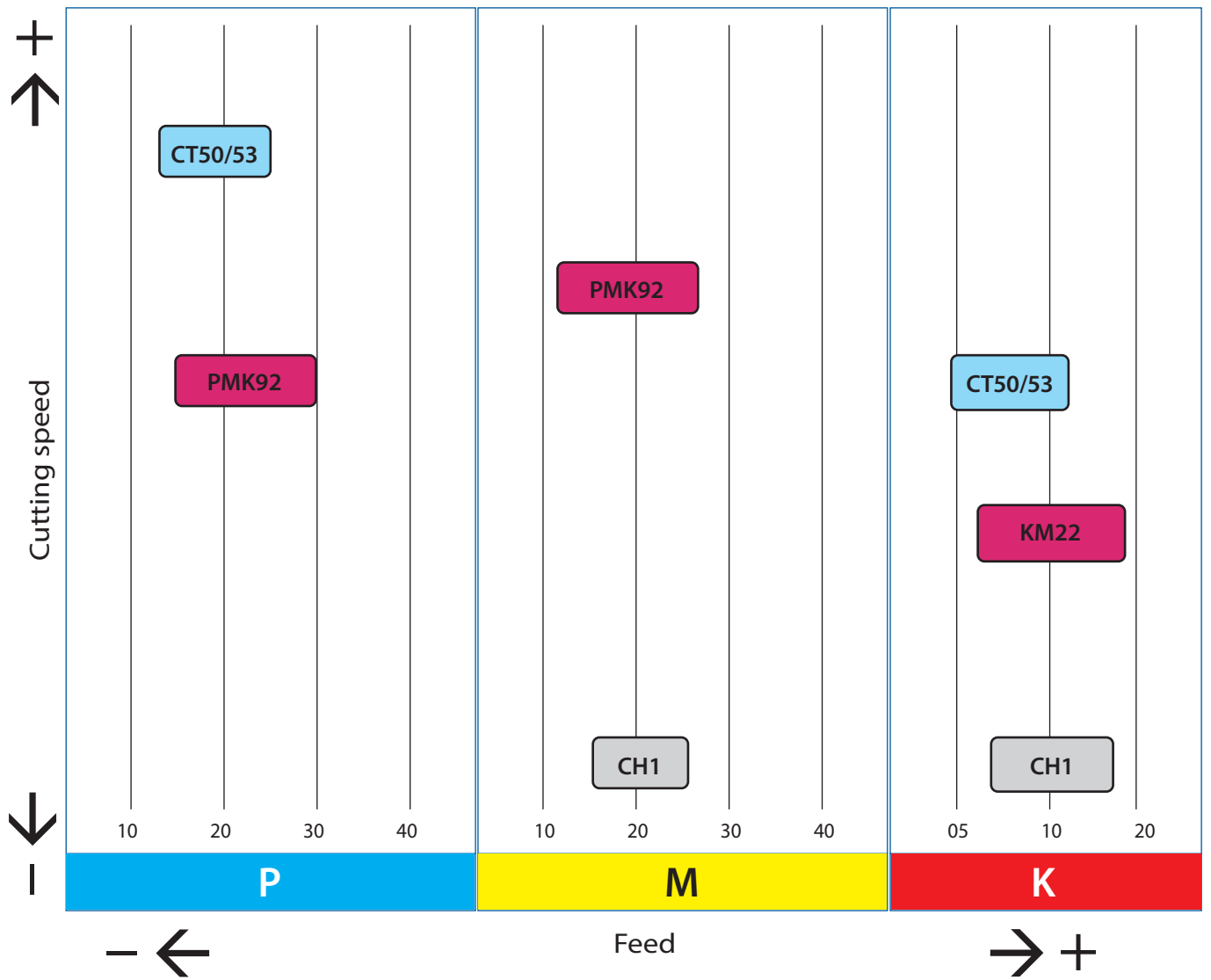
Manufacturer specific

## 8+9 Milling

R 10		R 16	
R 11		N 17	
N 12		N/R 18	
N 13		N/R 19	
N 14		N 20	
N 15			



## Carbide and Cermet Grades



Grade	Carbide	Ceramic	CERMET	TiAlN	TiN	TiCN	Al <sub>2</sub> O <sub>3</sub>	Steel <800	Steel >800	Inox Titan	Ni-Co Alloys	Cast Iron	Aluminium
CH1	●											●	●
KM22	●			●						●	○	●	
PMK92	●			●				●	●	○		○	
CT50			●					●	●			●	
CT53			●	●				●	●			●	

● excellent  
○ good

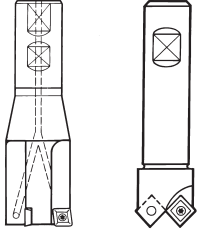
## Recommendations for 49030 series

49030	Projection	
	6 x d	3 x d
	Steel shank $f_z \sim 0,1$	Steel shank $f_z \sim 0,1$
Working Material	Vc m/min.	Vc m/min.
Free Cutting Steels General Purpose Steels Case hardening Steels unalloyed, C < 0,2%	50 - 60	150 - 250
Free Cutting Steels General Purpose Steels Tempering Steels alloyed, C < 0,45%	50 - 60	150 - 250
Tempering Steels Tool Steels alloyed, C < 0,8%	50 - 60	150 - 200
Highly Alloyed Steels Tool Steels for Cold / Hot Forming C > 0,8%	50 - 60	150 - 200
Stainless Steels, martensitic Stainless Castings	50 - 60	150 - 200
Stainless Steels, austenitic	50 - 60	150 - 200
High Temperature Alloys on Ni + Co Basis	40 - 60	40 - 90
Titanium Alloys	40 - 60	40 - 90
Grey Cast Iron	50 - 60	150 - 200
Malleable and Nodular Castings	50 - 60	150 - 200
Aluminium	50 - 60	150 - 200
Copper / Brass Bronze	50 - 60	150 - 200



## Recommendations

For cutting speeds  $V_c$  m/min. and feeds per tooth  $f_z$  mm for Milling-, Boring- and Chamfering Tools with indexable carbide and Cermet Inserts

Tool:			
Type.:	49037 49038 49039	49100	
Inserts	MPHT MPHW MPMT*	MCHT MCMT*	MBHT MBHW MBMT*
Dimensions	060202 060204*	09T304 09T308*	120404 120408*
$f_z$ :	0,03–0,1 0,03–0,12*	0,05–0,15 0,05–0,25*	0,05–0,15 0,05–0,25*

Working Material	Type	PMK92	CH1	KM22	CT50 CT53	CH1	CT50
		Vc m/min.					
Free Cutting Steel General Purpose Steels Case hardening Steels unalloyed, C < 0,2%	HB 150–200 < 600 mm <sup>2</sup>	180–350	–	–	300–500	–	300–500
Free Cutting Steel General Purpose Steels Tempering Steels unalloyed, C < 0,45%	HB 175–225 < 800 mm <sup>2</sup>	160–300	–	–	250–400	–	250–400
Tempering Steels Tool Steels alloyed, C < 0,8%	HB 200–300 < 1000 mm <sup>2</sup>	140–220	–	–	200–350	–	200–350
Highly Alloyed Steels Tool Steels for Cold / Hot Forming C > 0,8%	HB 200–300 < 1000 mm <sup>2</sup>	90–150	–	–	180–250	–	180–250
Stainless Steels, austenitic	HB 140–190 < 700 mm <sup>2</sup>	–	100–180	150–300	150–300	100–180	150–300
Stainless Steels, martensitic Stainless Castings	HB 175–245 < 1000 mm <sup>2</sup>	90–180	–	–	150–240	–	150–240
High Temperature Alloys on Ni + Cr Basis	HB 200–400 < 1200 mm <sup>2</sup>	–	15–60	15–70	15–70	15–60	15–70
Titanium Alloys	HB 215–500 < 1000 mm <sup>2</sup>	–	40–60	40–70	–	40–60	15–70
Grey Cast Iron	HB < 200	180–300	160–200	180–300	250–400	160–200	250–400
Malleable and Nodular Castings	HB > 200	170–280	150–190	170–280	250–400	150–190	250–400
Aluminum	HB < 160	–	300–1000	300–1000	–	300–1000	300–1000
Copper / Brass Bronze	HB < 120	–	180–200	180–270	–	190–240	200–300

\* in function of stability of tool and workpiece



shaping your dreams

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