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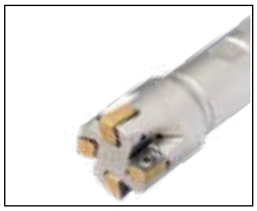

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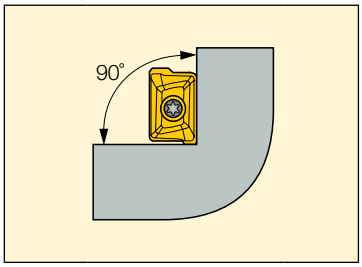

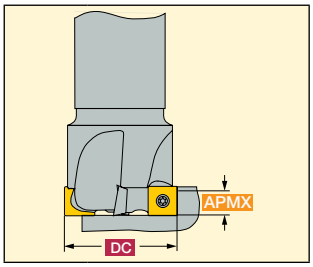

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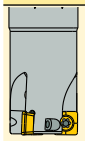
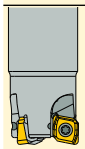
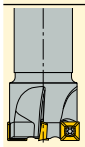
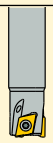
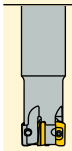
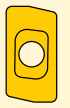
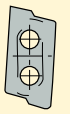
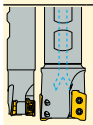
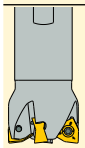
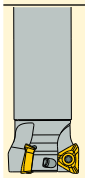
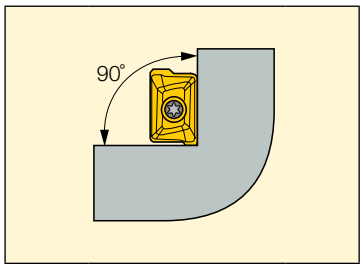
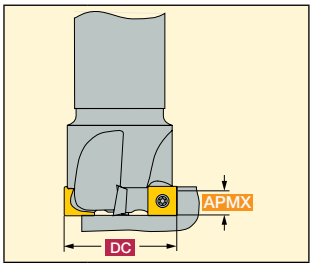
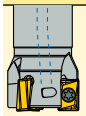
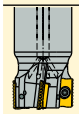
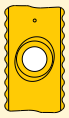
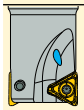
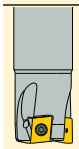
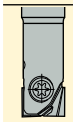
 E90SO-04 E90SO-MM-04	11 11	3.5	•	•	•	•	•	•				•												 SOMT/CT 0402
 E90CN-M E90CN	15 16	0.5		•	•	•	•	•				•												 CNHT/MT 07
 E90SP E90X	21 16	9.6 5.8		•	•	•	•	•		•		•			•			•		•				 SPMT 10.../ XPMT 10.../ QPMR 10.../ QPMT 10... SOMT 06.../ XOMT 06.../ SPCT 10.../ SPMR 10.../
 T290 ELN-05 T290 ELN-MM-05 T290 ELN-10	15 15 21	5 10		•	•	•	•	•				•			•			•		•				 T290 LNMT 05... T290 LNMT 1004
 HP E90AN-07 HP E90AN-M-07 HP E90AN-MM-07 HP E90AT-19	17 17 18 35	7.7 18			•	•	•	•				•			•	•		•						 HP ANKT 0702  HP AD..19
 HM90 E90A-10 HM90 E90A-MM-10 HM90 E90A-M-10 HM90 E90AD-15 HM90 E90AD-M-15	24-26 27 28 31 32	10 10 10 14.3 14.3			•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			 HM90 AP...10/ AP...10/ HM90 AD...15/ AD...15/
 H690 EWN-04 H690 EWN-07	12 16	4 7								•	•	•			•			•		•				 H690 WNMU 0403 H690 WNHU/ WNMU 0705
 HM390 ETP-04 HM390 ETP-MM-04 HM390 ETP-05 HM390 ETP-MM-05 HM390 ETC-07 HM390 ETC-MM HM390 ETP-10 HM390 ETP-M HM390 ETP-C#-10 HM390 ETD-15 HM390 ETD-M HM390 ETD-19	13 13 14 14 18 18 22 22 23 30 31 33	3 3.5 5 8 13 16			•	•	•	•		•		•		•	•	•		•		•	•			 HM390 TPKR 0401/ HM390 TPKT/CT 0502/ HM390 TCKT/CT 0703/ HM390 TPKT/CT 1003/ HM390 TDKT/CT 1505 HM390 TDKT 1907

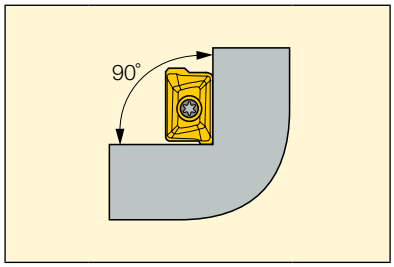
Endmills 90° Selection Guide

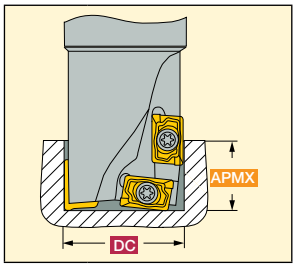


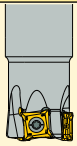
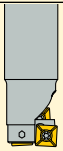
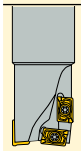


Tools	Pages	DC / APMX	6	8	10	12	14	16	17	18	19	20	21	22	25	28	30	32	38	40	50	63	80	Inserts
 H490 E90AX-09 H490 E90AX-M H490 E90AX-MM H490 E90AX-12 H490 E90AX-17	20 20 21 30 33	8 12 16.3						•		•		•		•	•			•		•	•	•	•	 HM490 ANKX/ANCX -09/ HM490 ANKX/ANCX -12/ HM490 ANKX/ANCX -17
 P290 EPW P290 EPW-M	34 35	12 18										•			•			•		•				 P290 ACKT 1204 P290 ACKT 1806
 H690 E90AX-10	28	8										•			•			•		•				 HM690 TNKX/ TNCX 1005
 T490 ELN-08 T490 ELN-M-08 T490 ELN-MM..-08 T490 ELN-11 T490 ELN-13 T490 ELN-16	19 19 20 29 30 33	8 9 12.5 16						•		•		•		•	•			•		•	•			 T490 LN..0804 T490 LN..1106 T490 LN..1306 T490 LN..1607
 HCE HCE-MM	23 23	8.1- 14.7				•		•				•			•									 HTR HCC

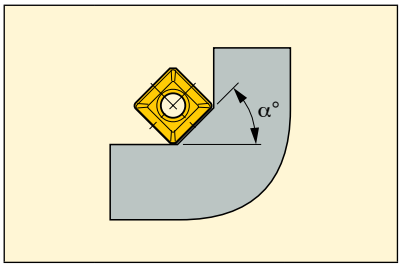
Center Cutting Endmills

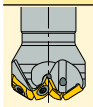
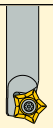
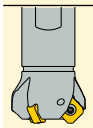
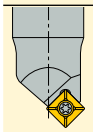
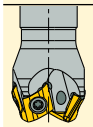
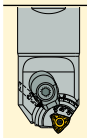




Tools	Pages	DC / APMX	8	10	12	14	16	17	18	19	20	21	22	25	28	30	32	38	40	50	63	80	Inserts
 T890HT ELN-R13	29	9.5															•		•				 T890 LN.T 1306
 E90XC	36	5.8-22			•		•				•												 SOMT-HQ XOMT-HQ
 E90AC	36	19-38												•			•	•					 ADCT 1505.../ ADKT 1505.../ FDKT 1505...

Endmills 30°, 45°, 60° Selection Guide

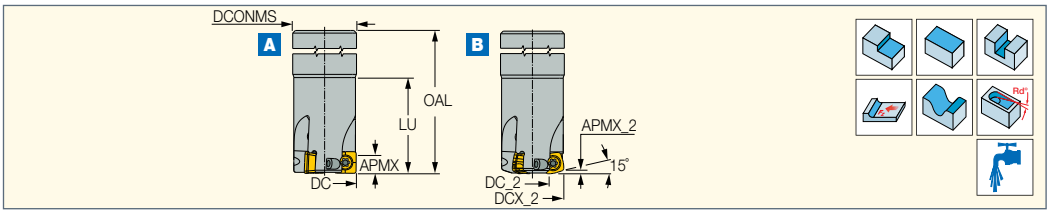


Tools	Pages	DC / APMX	6	8	12	16	20	25	30	32	40	Inserts
			Number of Teeth (Effective)									
 E30 T230	36 36	2.5 7 α=30°			4	3						 T290 LNMT 05...  TPMT
 CH45-PN06 CH45-MM-PN06	37 37	1.5 α=45°			1	1						 PNMT 0602-TN
 SOE 45 8/16	38	3.5-6 α=45°						2		3	4	 S845 SNMU/ SNHU 1306  ONMU/ ONHU 0505
 E45X	38	4 α=45°	1	1								 SOMT 06... XOMT 06.. QOMT 06..
 E45 T245	38 38	3.6-9.7 α=45°			1-4	2			3			 SCMT 12 SDMT 09 T290 LNMT 05... TPMT
 HCM	262-265	5 - 12 α=45°			2	2	2	2				 HCD
 E60 T260	39 39	4.5 12.3 α=60°			4			2				 T290 LNMT 05...TPMT
 HM390 E10-80-07	39	0.35-1.97 α=10°-80°						1				 HM390 TCK/CT 0703

HELI4MILL HM490 LINE

E90SO-04

Endmills Carrying Inserts for Shouldering and Fast Feed Applications



Designation	DC	APMX	DC_2	DCX_2	APMX_2	LU	OAL	DCONMS	Shank(1)	CICT(2)	RMPX°(3)	MIID(4)	MIID_2(5)	kg
E90SO D06-1-C06-04-C	6.00	3.50	-	6.17	0.50	15.00	57.00	6.00	C	1	-	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.06
E90SO D08-1-C08-04-C	8.00	3.50	1.90	8.17	0.50	15.30	60.00	8.00	C	1	8.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.01
E90SO D10-2-C10-04-C	10.00	3.50	3.90	10.17	0.50	18.00	70.00	10.00	C	2	6.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.04
E90SO D12-2-C12-04-C	12.00	3.50	5.90	12.17	0.50	18.00	70.00	12.00	C	2	3.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.05
E90SO D12-3-C12-04-C	12.00	3.50	5.90	12.17	0.50	18.00	70.00	12.00	C	3	3.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.05
E90SO D14-4-C14-04-C	14.00	3.50	7.90	14.17	0.50	20.00	80.00	14.00	C	4	2.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.08
E90SO D16-4-C16-04-C	16.00	3.50	9.90	16.17	0.50	20.00	90.00	16.00	C	4	2.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.12
E90SO D16-5-C16-04-C	16.00	3.50	9.90	16.17	0.50	20.00	90.00	16.00	C	5	2.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.12
E90SO D20-6-C20-04-C	20.00	3.50	13.90	20.17	0.50	25.00	110.00	20.00	C	6	1.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.23

• A - with SOMT/CT 0402 insert • B - with SOMT 0402-FF insert • Tightening torque 0.5 Nxm

(1) C-Cylindrical

(2) Number of inserts

(3) Maximum ramping angle - valid only with SOMT 040208 PNR-FF insert

(4) Master insert identification

(5) Master insert identification 2

For inserts, see pages: SOMT 0402-FF (500) • SOMT/CT 0402 (500)

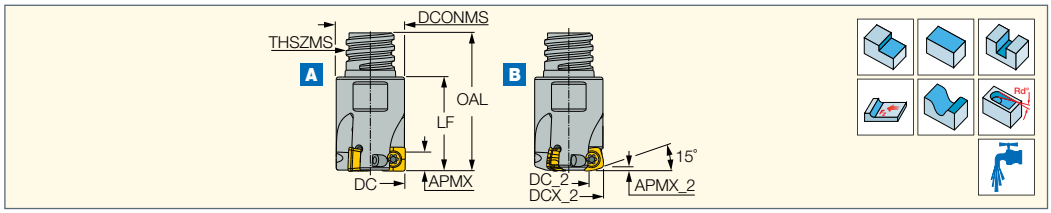
Spare Parts

Designation		
E90SO D06-1-C06-04-C	TS 18041I/HG/S	T-6IP/51
E90SO D08-1-C08-04-C	TS 18041I/HG/S	T-6IP/51
E90SO D10-2-C10-04-C	TS 18041I/HG	T-6IP/51
E90SO D12-2-C12-04-C	TS 18041I/HG	T-6IP/51
E90SO D12-3-C12-04-C	TS 18041I/HG	T-6IP/51
E90SO D14-4-C14-04-C	TS 18041I/HG	T-6IP/51
E90SO D16-4-C16-04-C	TS 18041I/HG	T-6IP/51
E90SO D16-5-C16-04-C	TS 18041I/HG	T-6IP/51
E90SO D20-6-C20-04-C	TS 18041I/HG	T-6IP/51

HELI4MILL HM490 LINE MULTI-MASTER

E90SO-MM-04

Endmills with a MULTI-MASTER Connection Carrying Inserts for Shouldering and Fast Feed Applications



Designation	DC	APMX	DC_2	DCX_2	APMX_2	LF	OAL	CICT(1)	DCONMS	THSZMS	DRVS(2)	RMPX°(3)	MIID(4)	MIID_2(5)	kg
E90SO D10-2-MMT06-04	10.00	3.50	3.90	10.17	0.50	15.00	21.30	2	9.70	T06	8.0	6.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.05
E90SO D12-3-MMT08-04	12.00	3.50	5.90	12.17	0.50	16.00	23.50	3	11.60	T08	10.0	3.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.15
E90SO D14-4-MMT08-04	14.00	3.50	7.90	14.17	0.50	16.00	23.50	4	13.60	T08	10.0	2.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.01
E90SO D16-5-MMT10-04	16.00	3.50	9.90	16.17	0.50	18.00	29.30	5	15.60	T10	13.0	2.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.03
E90SO D20-6-MMT12-04	20.00	3.50	13.90	20.17	0.50	25.00	38.80	6	19.60	T12	16.0	1.0	SOMT 040204 PNTR	SOMT 040208 PNR-FF	0.08

• A - with SOMT/CT 0402 insert • B - with SOMT 0402-FF insert • Tightening torque 0.5 Nxm

(1) Number of inserts

(2) Torque key size

(3) Maximum ramping angle - valid only with SOMT 040208 PNR-FF insert

(4) Master insert identification

(5) Master insert identification 2

For inserts, see pages: SOMT 0402-FF (500) • SOMT/CT 0402 (500)

For holders, see pages: MM CAB (667) • MM CAB-T-T (91) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

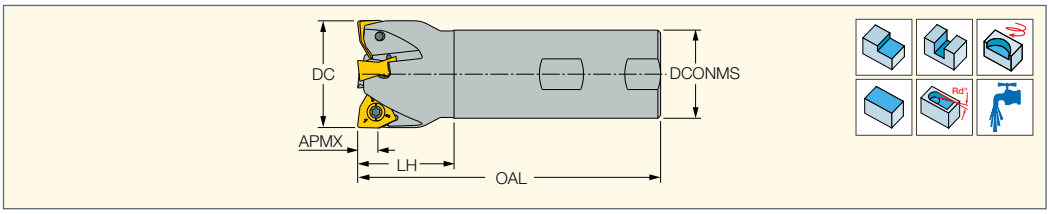
Spare Parts

Designation		
E90SO-MM-04	TS 18041I/HG	T-6IP/51

HELIDO TRIGON LINE

H690 EWN-04

90° Endmills Carrying H690 WNMU 0403 Double-Sided Trigonal Inserts with 6 Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg
H690 EWN D18-2-C16-R04	18.00	2	4.00	100.00	24.0	16.00	C	1.7	0.14
H690 EWN D18-2-C16-R04-B	18.00	2	4.00	160.00	24.0	16.00	C	1.7	0.21
H690 EWN D20-2-C19-R04-B	20.00	2	4.00	160.00	26.0	19.00	C	1.5	0.31
H690 EWN D20-2-C20-R04	20.00	2	4.00	110.00	26.0	20.00	C	1.5	0.42
H690 EWN D20-3-C19-R04-B	20.00	3	4.00	160.00	26.0	19.00	C	1.5	0.30
H690 EWN D20-3-C20-R04	20.00	3	4.00	110.00	26.0	20.00	C	1.5	0.24
H690 EWN D20-3-C20-R04-B	20.00	3	4.00	160.00	26.0	20.00	C	1.5	0.31
H690 EWN D20-3-W20-R04	20.00	3	4.00	85.00	26.0	20.00	W	1.5	0.16
H690 EWN D25-4-C25-R04	25.00	4	4.00	120.00	30.0	25.00	C	1.1	0.36
H690 EWN D25-5-C25-R04	25.00	5	4.00	120.00	30.0	25.00	C	1.1	0.37
H690 EWN D25-5-W25-R04	25.00	5	4.00	95.00	30.0	25.00	W	1.1	0.22
H690 EWN D32-5-C32-R04	32.00	5	4.00	130.00	35.0	32.00	C	0.8	0.68
H690 EWN D32-6-C32-R04	32.00	6	4.00	130.00	35.0	32.00	C	0.8	0.68
H690 EWN D32-6-W32-R04	32.00	6	4.00	110.00	35.0	32.00	W	0.8	0.56

• For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical , W-Weldon

(3) Maximum ramping angle

For inserts, see pages: H690 WNMU 0403 (468)

Spare Parts

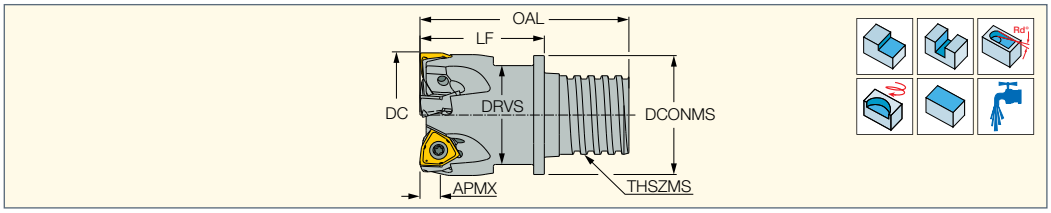
Designation		
H690 EWN-04	SR M2.5X6-T7-60	T-7/51

HELIDO TRIGON LINE

MULTI-MASTER

H690 EWN-MM-04

90° Endmills with a MULTI-MASTER Threaded Connection Carrying H690 WNMU 0403 Double-Sided Trigonal Inserts



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	TQ_3(4)	kg
H690 EWN D20-3-MMT12-R04	20.00	4.00	3	20.00	18.30	T12	33.00	16.0	1.5	28	0.07
H690 EWN D25-5-MMT15-R04	25.00	4.00	5	25.00	23.90	T15	42.00	20.0	1.1	40	0.12

• Insert clamping screw must be lubricated every indexing. • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

(4) Tool tightening torque (Nxm)

For inserts, see pages: H690 WNMU 0403 (468)

For holders, see pages: MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

Spare Parts

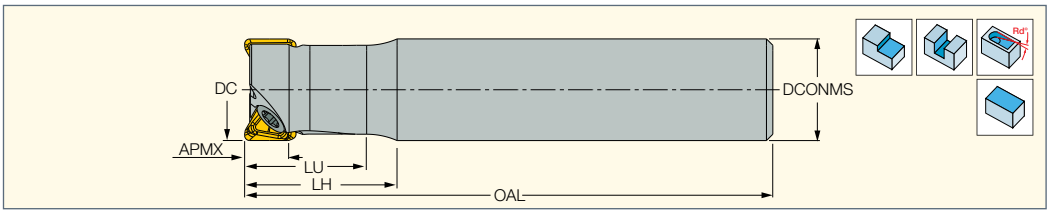
Designation		
H690 EWN-MM-04	SR M2.5X6-T7-60[a]	T-7/51

[a] Tightening torque 0.9 Nxm

NANMILL
NANO ENDMILL

HM390 ETP-04

90° Small Diameter Endmills Carrying HM390 TPKR 0401 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LU	LH	DCONMS	Shank(2)	RMPX°(3)	kg
HM390 ETP D08-2-C08-04	8.00	3.00	2	60.00	9.60	12.0	8.00	C	3.0	0.02
HM390 ETP D10-3-C10-04	10.00	3.00	3	80.00	12.60	15.0	10.00	C	2.5	0.05

• Tightening torque 0.5 Nxm
(1) Number of inserts
(2) C-Cylindrical
(3) Maximum ramping angle
For inserts, see pages: HM390 TPKR 0401 (446)

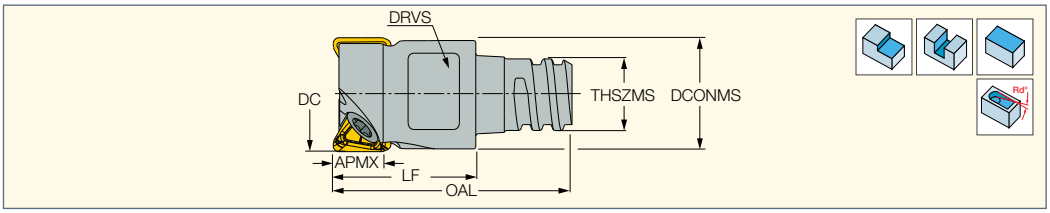
Spare Parts

Designation		
HM390 ETP D08-2-C08-04	SR M2X0.4-3 T6	T-6/5 MAGNET 3X3
HM390 ETP D10-3-C10-04	SR M2X0.4-3.5 T6	T-6/5 MAGNET 3X3

NANMILL
NANO ENDMILL
MULTI-MASTER

HM390 ETP-MM-04

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying HM390 TPKR 0401... Triangular Inserts



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	kg
HM390 ETP D08-2-MMT05-04	8.00	3.00	2	10.00	7.60	T05	16.75	5.5	3.0	0.00
HM390 ETP D10-3-MMT06-04	10.00	3.00	3	12.00	9.60	T06	18.30	8.0	2.5	0.00

• Insert tightening torque 0.5 N*m • For adaptation, see page 44 • For user guide, see pages 542-548
(1) Number of inserts
(2) Clamping wrench size
(3) Maximum ramping angle
For inserts, see pages: HM390 TPKR 0401 (446)
For holders, see pages: MM CAB (667) • MM CAB-T-T (91) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

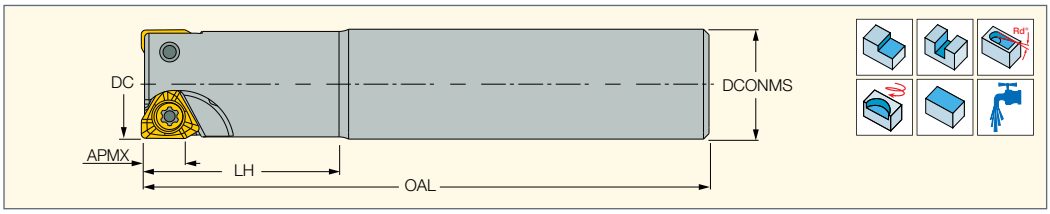
Spare Parts

Designation		
HM390 ETP D08-2-MMT05-04	SR M2X0.4-3 T6	T-6/5 MAGNET 3X3
HM390 ETP D10-3-MMT06-04	SR M2X0.4-3.5 T6	T-6/5 MAGNET 3X3

HELI3MILL HM390 LINE

HM390 ETP-05

90° Endmills Carrying HM390 TPKT 0502 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg
HM390 ETP D06-01-C06-05-C	6.00	3.50	1	57.00	15.0	6.00	C	1.0	0.06
HM390 ETP D08-01-C08-05-C	8.00	3.50	1	60.00	14.9	8.00	C	1.0	0.03
HM390 ETP D10-02-C10-05-C	10.00	3.50	2	70.00	18.0	10.00	C	2.0	0.03
HM390 ETP D12-03-C12-05-C	12.00	3.50	3	70.00	18.0	12.00	C	1.5	0.06
HM390 ETP D14-03-C14-05-C	14.00	3.50	3	80.00	20.0	14.00	C	1.5	0.08
HM390 ETP D16-04-C16-05-C	16.00	3.50	4	90.00	20.0	16.00	C	1.5	0.12

• Tightening torque 0.5 N*m • For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical

(3) Maximum ramping angle

For inserts, see pages: HM390 TPKT/CT 0502 (446)

Spare Parts

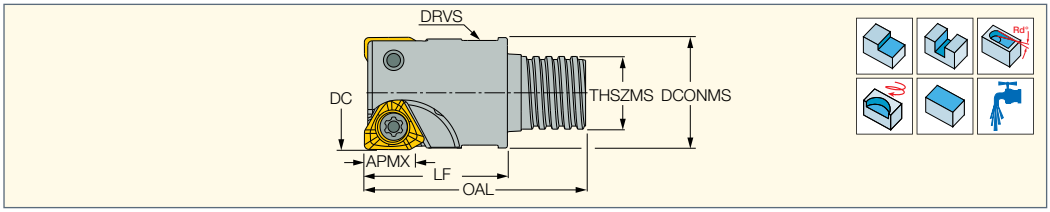
Designation		
HM390 ETP D06-01-C06-05-C	TS 18041I/HG/S	T-6IP/51
HM390 ETP D08-01-C08-05-C	TS 18041I/HG/S	T-6IP/51
HM390 ETP D10-02-C10-05-C	TS 18041I/HG	T-6IP/51
HM390 ETP D12-03-C12-05-C	TS 18041I/HG	T-6IP/51
HM390 ETP D14-03-C14-05-C	TS 18041I/HG	T-6IP/51
HM390 ETP D16-04-C16-05-C	TS 18041I/HG	T-6IP/51

HELI3MILL HM390 LINE

MULTI-MASTER

HM390 ETP-MM-05

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying HM390 TPKT 0502... Triangular Inserts



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	kg
HM390 ETP D10-02-MMT06-05	10.00	3.50	2	15.00	9.60	T06	21.60	8.0	2.0	0.01
HM390 ETP D12-03-MMT08-05	12.00	3.50	3	16.00	11.60	T08	24.20	10.0	1.5	0.01
HM390 ETP D14-03-MMT08-05	14.00	3.50	3	16.00	13.60	T08	22.90	10.0	1.5	0.01
HM390 ETP D16-04-MMT10-05	16.00	3.50	4	18.00	15.60	T10	29.80	13.0	1.5	0.03

• Insert tightening torque 0.5 N*m • For adaptation, see page 44 • For user guide, see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

For inserts, see pages: HM390 TPKT/CT 0502 (446)

For holders, see pages: MM CAB (667) • MM CAB-T-T (91) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

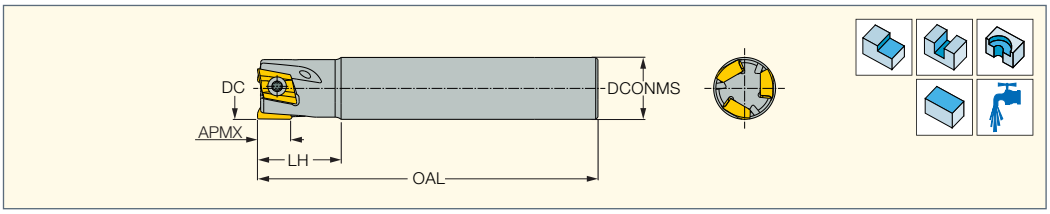
Spare Parts

Designation		
HM390 ETP-MM-05	TS 18041I/HG	T-6IP/51

SUMOMILL 290 LINE

T290 ELN-05

Endmills Carrying Tangentially Clamped Inserts



Designation	DC	CICT(1)	OAL	LH	APMX	DCONMS	Shank(2)	kg		
T290 ELN D08-01-C08-05	8.00	1	60.00	20.0	5.00	8.00	C	0.02	SR 10503833	T-7/51
T290 ELN D10-02-C10-05	10.00	2	80.00	20.0	5.00	10.00	C	0.04	SR 10503833-S	T-7/51
T290 ELN D12-02-C12-05	12.00	2	80.00	20.0	5.00	12.00	C	0.06	SR 10503833	T-7/51
T290 ELN D12-03-C12-05	12.00	3	80.00	20.0	5.00	12.00	C	0.07	SR 10503833	T-7/51
T290 ELN D14-03-C14-05	14.00	3	80.00	20.0	5.00	14.00	C	0.08	SR 10503833	T-7/51
T290 ELN D16-04-C16-05	16.00	4	80.00	22.0	5.00	16.00	C	0.10	SR 10503833	T-7/51
T290 ELN D16-05-C16-05	16.00	5	80.00	22.0	5.00	16.00	C	0.10	SR 10503833	T-7/51

• For user guide see pages 542-548

(1) Number of inserts

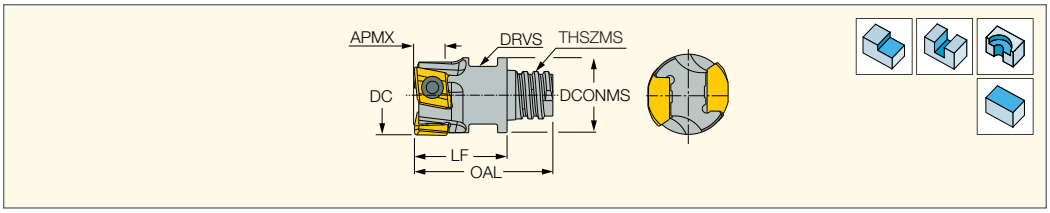
(2) C-Cylindrical

For inserts, see pages: T290 LNMT/LNHT 0502 (474)

SUMOMILL 290 LINE MULTI-MASTER

T290 ELN-MM-05

Endmills with a MULTI-MASTER Adaptation Carrying Tangentially Clamped Inserts



Designation	DC	CICT(1)	APMX	DCONMS	THSZMS	LF	OAL	DRVS(2)	kg		
T290 ELN D10-02-MMT06-05	10.00	2	5.00	9.20	T06	13.40	20.00	8.0	0.01	SR 10503833-S	T-7/51
T290 ELN D12-03-MMT08-05	12.00	3	5.00	11.00	T08	16.00	24.00	10.0	0.01	SR 10503833	T-7/51
T290 ELN D14-03-MMT08-05	14.00	3	5.00	13.00	T08	16.06	24.00	10.0	0.01	SR 10503833	T-7/51
T290 ELN D16-04-MMT10-05	16.00	4	5.00	14.95	T10	19.25	31.00	13.0	0.03	SR 10503833	T-7/51

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

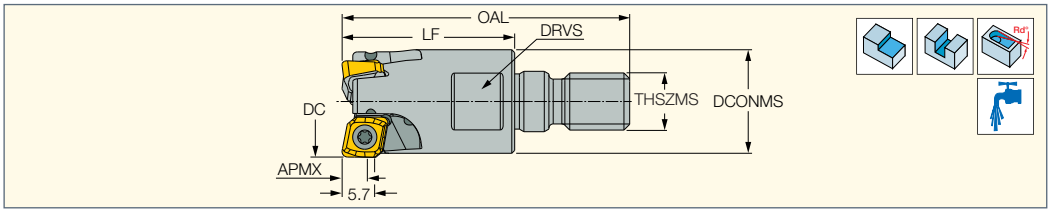
For inserts, see pages: T290 LNMT/LNHT 0502 (474)

For holders, see pages: MM CAB (667) • MM CAB-T-T (91) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

TORMILL FLEXFIT

E90CN-M

90° Endmills with a FLEXFIT Threaded Connection Carrying CNMT/HT 0703 Inserts



Designation	DC	CICT(1)	APMX(2)	LF	OAL	THSZMS	RMPX°(3)	DCONMS	DRVS(4)	TQ_3(5)	kg		
E90CN D16-2-M08-07-C	16.00	2	4.00	30.00	47.50	M08	5.0	13.00	13.0	20	0.03	SR 34-505/LHG	T-8/53
E90CN D20-3-M10-07-C	20.00	3	4.00	30.00	50.00	M10	3.5	18.00	16.0	29	0.05	SR 34-505/LHG	T-8/53
E90CN D25-4-M12-07-C	25.00	4	4.00	35.00	57.00	M12	2.5	21.00	17.0	33	0.09	SR 34-505/LHG	T-8/53

• For adaptation see page 44 • For user guide see pages 542-548

• When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Maximum recommended depth of cut for CNMT 070308-MM insert, APMX=2 mm for CNHT 070305 insert

(3) Maximum ramping angle

(4) Clamping wrench size

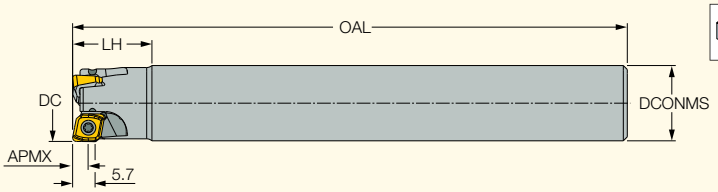
(5) Tool tightening torque Nxm (lbfxin)

For inserts, see pages: CNHT/MT 07 (538)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

TORMILL

E90CN
90° Endmills Carrying
CNMT/HT 0703 Inserts



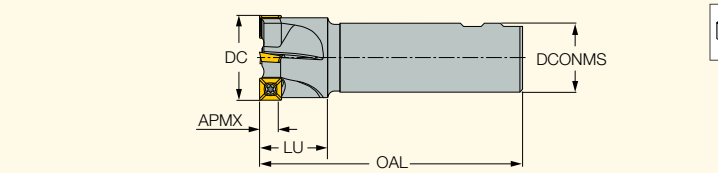
Designation	DC	CICT(1)	APMX(2)	LH	OAL	RMPX°(3)	DCONMS	kg		
E90CN D16-2-L100-C15-07-C	16.00	2	4.00	20.0	100.00	5.0	15.00	0.11	SR 34-505/LHG	T-8/53
E90CN D20-3-L140-C19-07-C	20.00	3	4.00	20.0	140.00	3.5	19.00	0.27	SR 34-505/LHG	T-8/53
E90CN D25-4-L160-C24-07-C	25.00	4	4.00	20.0	160.00	2.5	24.00	0.48	SR 34-505/LHG	T-8/53

- For user guide see pages 542-548

(1) Number of inserts
(2) Maximum recommended depth of cut for CNMT 070308-MM insert, for CNHT 070305 insert APMX=2 mm
(3) Maximum ramping angle
For inserts, see pages: CNHT/MT 07 (538)

HELiQUAD

E90X
Endmills Carrying Square
Q/S/XOMT Inserts



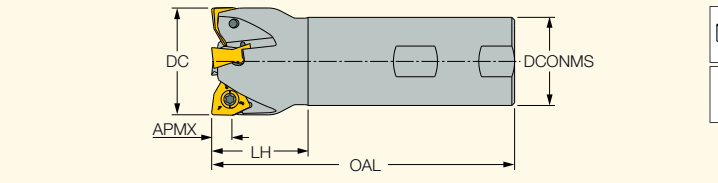
Designation	DC	CICT(1)	APMX	LU	OAL	DCONMS	Shank(2)	RMPX°(3)	kg		
E90X D08-C10-06	8.00	1	5.80	16.0	70.00	10.00	C	0.5	0.04	SR 34-508	T-7/51
E90X D10-C10-06	10.00	1	5.80	20.0	80.00	10.00	C	1.0	0.04	SR 34-508	T-7/51
E90X D12-C16-06	12.00	1	5.80	22.0	80.00	16.00	C	90.0	0.10	SR 34-508	T-7/51
E90X D14-C16-06	14.00	2	5.80	20.0	80.00	16.00	C	-	0.11	SR 34-508/L	T-7/51
E90X D14-W16-06	14.00	2	5.80	22.0	70.00	16.00	W	-	0.09	SR 34-508/L	T-7/51
E90X D16-C16-06	16.00	2	5.80	20.0	90.00	16.00	C	3.5	0.13	SR 34-508/L	T-7/51
E90X D20-C20-06	20.00	3	5.80	22.0	110.00	20.00	C	3.0	0.25	SR 34-508/L	T-7/51
E90X D25-C20-06	25.00	4	5.80	25.0	120.00	20.00	C	2.5	0.29	SR 34-508/L	T-7/51
E90X D32-W25-06	32.00	5	5.80	25.0	90.00	25.00	W	3.8	0.34	SR 34-508/L	T-7/51

- For user guide see pages 542-548

(1) Number of inserts
(2) C-Cylindrical, W-Weldon
(3) Maximum ramping angle
For inserts, see pages: QOMT-HQ (494) • SOMT-HQ (494) • XOMT-HQ (494)

HELiDO TRIGON LINE

H690 EWN-07
90° Endmills Carrying H690
WNMU 0704 Double-Sided
Trigonal Inserts with 6
Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg			
H690 EWN D032-03-W32-R07	32.00	3	7.00	110.00	48.0	32.00	W	2.0	0.56	SR M4X0.7IP15	BLD IP15/S7	SW6-T-SH
H690 EWN D040-04-W32-R07	40.00	4	7.00	110.00	35.0	32.00	W	1.5	0.64	SR M4X0.7IP15	BLD IP15/S7	SW6-T-SH

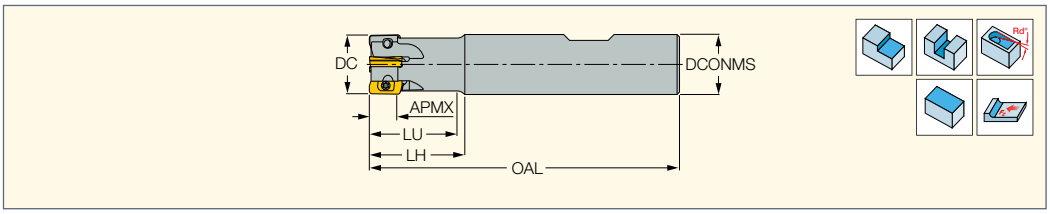
- Insert clamping screw must be lubricated every indexing. • Tightening torque 0.9 Nxm. • For user guide see pages 542-548

(1) Number of inserts
(2) C-cylindrical, W-Weldon
(3) Maximum ramping angle
For inserts, see pages: H690 WNHU/WNMU 0705 (469)

HELIPLUS

HP E90AN-07

Endmills with HELIPLUS
HP ANKT 0702.. Inserts



Designation	DC	CICT(2)	LH	LU	OAL	APMX	DCONMS	Shank(3)	RMPX°(4)	RMPX°_2(5)	CSP(6)	kg		
HP E90AN-D10-1-C10-07-C	10.00	1	20.0	18.0	80.00	7.70	10.00	C	2.5	-	1	0.04	SR 34-533	T-6/51
HP E90AN-D12-2-C12-07-C	12.00	2	18.0	16.2	80.00	7.70	12.00	C	2.7	3.5	1	0.06	SR 34-533/L/HG	T-6/51
HP E90AN-D14-2-C14-07-C	14.00	2	18.0	16.5	80.00	7.70	14.00	C	3.2	4.2	1	0.08	SR 34-533/L/HG	T-6/51
HP E90AN-D16-3-C15-07-C-B (1)	16.00	3	26.0	24.5	150.00	7.70	15.00	C	3.2	6.0	1	0.17	SR 34-533/L/HG	T-6/51
HP E90AN-D16-3-C16-07-C	16.00	3	26.0	24.5	90.00	7.70	16.00	C	3.2	6.0	1	0.11	SR 34-533/L/HG	T-6/51
HP E90AN-D16-3-W16-07	16.00	3	21.0	18.5	85.00	7.70	16.00	W	3.2	6.0	0	0.12	SR 34-533/L/HG	T-6/51
HP E90AN-D16-4-C16-07-C	16.00	4	26.0	24.5	90.00	7.70	16.00	C	3.2	6.0	1	0.11	SR 34-533/L/HG	T-6/51
HP E90AN-D16-4-W16-07	16.00	4	20.0	18.5	85.00	7.70	16.00	W	3.2	6.0	0	0.12	SR 34-533/L/HG	T-6/51
HP E90AN-D20-4-C19-07-C-B (1)	20.00	4	22.0	20.5	160.00	7.70	19.00	C	2.4	4.5	1	0.31	SR 34-533/L/HG	T-6/51
HP E90AN-D20-4-C20-07-C	20.00	4	22.0	20.5	110.00	7.70	20.00	C	2.4	4.5	1	0.23	SR 34-533/L/HG	T-6/51
HP E90AN-D20-5-C20-07-C	20.00	5	22.0	20.5	110.00	7.70	20.00	C	2.4	4.5	1	0.23	SR 34-533/L/HG	T-6/51
HP E90AN-D20-5-W20-07	20.00	5	22.0	20.5	90.00	7.70	20.00	W	2.4	4.5	0	0.20	SR 34-533/L/HG	T-6/51
HP E90AN-D25-5-C20-07-C	25.00	5	24.0	-	120.00	7.70	20.00	C	2.0	3.0	1	0.28	SR 34-533/L/HG	T-6/51
HP E90AN-D25-7-C20-07-C	25.00	7	24.0	-	120.00	7.70	20.00	C	2.0	3.0	1	0.27	SR 34-533/L/HG	T-6/51
HP E90AN-D32-8-C25-07-C	32.00	8	30.0	-	130.00	7.70	25.00	C	1.4	2.5	1	0.48	SR 34-533/L/HG	T-6/51

• Insert tightening torque: 62 Nxcm • For user guide see pages 542-548

(1) "B" suffix - cylindrical shank which may be shortened.

(2) Number of inserts

(3) C-Cylindrical, W-Weldon

(4) Maximum ramping angle

(5) Values only for HP ANKT 0702R12T-FF insert

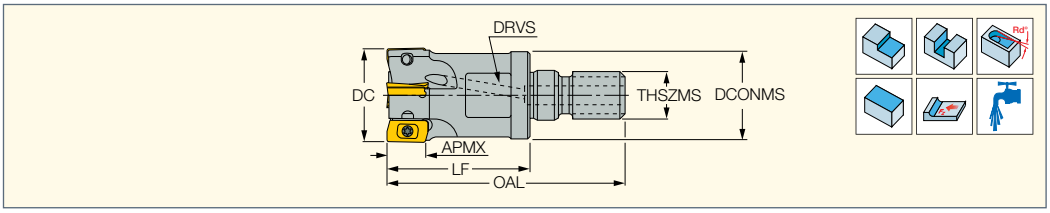
(6) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: HP ANCR 0702PNFR (444) • HP ANKT 0702...-FF (445) • HP ANKT/ANCT 0702..PN-R/PNTR (444) • HP ANKW 070204PNTR (444)

HELIPLUS FLEXFIT

HP E90AN-M-07

90° Endmills with a FLEXFIT
Threaded Adaptation
Carrying HELIPLUS HP
ANKT 0702.. Inserts



Designation	DC	CICT(1)	THSZMS	OAL	LF	APMX	DCONMS	RMPX°(2)	RMPX°_2(3)	DRVS(5)	TQ_3(4)	kg		
HP E90AN-D25-5-M12	25.00	5	M12	57.00	35.00	7.70	21.00	2.0	3.0	19.0	33	0.09	SR 34-533/L/HG	T-6/51

• Insert tightening torque: 62 Nxcm • For adaptation see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Maximum ramping angle

(3) Values only for HP ANKT 0702R12T-FF insert

(4) Torque key size

(5) Tool tightening torque Nxm (lbfxin)

For inserts, see pages: HP ANCR 0702PNFR (444) • HP ANKT 0702...-FF (445) • HP ANKT/ANCT 0702..PN-R/PNTR (444) • HP ANKW 070204PNTR (444)

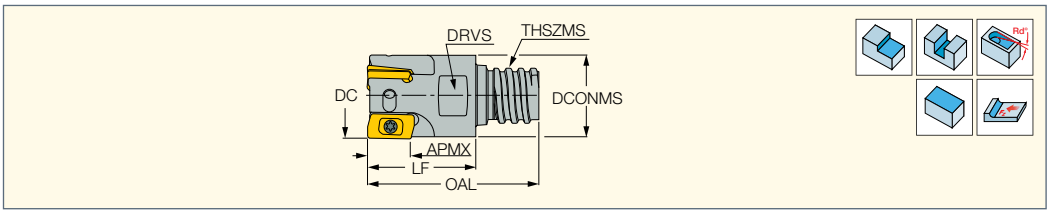
For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

HELIPLUS

MULTI-MASTER

HP E90AN-MM-07

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying HELIPLUS HP ANKT 0702.. Inserts



Designation	DC	CICT(1)	OAL	LF	APMX	THSZMS	DCONMS	DRVS(2)	RMPX°(3)	RMPX°_2(4)	kg		
HP E90AN-D12-2-MMT08	12.00	2	24.45	16.50	7.70	T08	10.60	10.0	2.7	3.5	0.01	SR 34-533/L/HG	T-6/51
HP E90AN-D16-3-MMT10	16.00	3	31.75	20.00	7.70	T10	14.95	13.0	3.2	6.0	0.03	SR 34-533/L/HG	T-6/51
HP E90AN-D16-4-MMT10	16.00	4	31.75	20.00	7.70	T10	14.95	13.0	3.2	6.0	0.03	SR 34-533/L/HG	T-6/51
HP E90AN-D20-5-MMT12	20.00	5	35.30	21.50	7.70	T12	18.40	16.0	2.4	4.5	0.05	SR 34-533/L/HG	T-6/51

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

(4) Values only for HP ANKT 0702R12T-FF insert

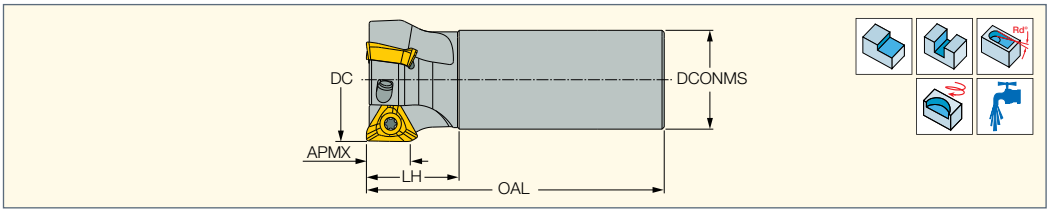
For inserts, see pages: HP ANCR 0702PNFR (444) • HP ANKT 0702...-FF (445) • HP ANKT/ANCT 0702..PN-R/PNTR (444) • HP ANKW 070204PNTR (444)

For holders, see pages: MM CAB (667) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

HELI3MILL HM390 LINE

HM390 ETC-07

90° Endmills Carrying HM390 TCKT 0703 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg		
HM390 ETC D14-1-C16-07	14.00	5.00	1	80.00	21.0	16.00	C	1.9	0.10	SR M2.5X5-T7-60	T-7/51
HM390 ETC D16-2-C15-07-B	16.00	5.00	2	150.00	26.0	15.00	C	1.9	0.17	SR M2.5X5-T7-60	T-7/51
HM390 ETC D16-2-C16-07	16.00	5.00	2	100.00	26.0	16.00	C	1.9	0.12	SR M2.5X5-T7-60	T-7/51
HM390 ETC D16-2-C16-07-B	16.00	5.00	2	150.00	40.0	16.00	C	1.9	0.19	SR M2.5X5-T7-60	T-7/51
HM390 ETC D16-2-W16-07	16.00	5.00	2	80.00	26.0	16.00	W	1.9	0.10	SR M2.5X5-T7-60	T-7/51
HM390 ETC D18-2-C16-07	18.00	5.00	2	100.00	30.0	16.00	C	1.4	0.13	SR M2.5X5-T7-60	T-7/51
HM390 ETC D18-2-C16-07-B	18.00	5.00	2	160.00	30.0	16.00	C	1.4	0.21	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-C16-07	20.00	5.00	3	55.00	20.0	16.00	C	1.4	0.07	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-C19-07-B	20.00	5.00	3	160.00	30.0	19.00	C	1.4	0.28	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-C20-07	20.00	5.00	3	110.00	30.0	20.00	C	1.4	0.21	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-C20-07-B	20.00	5.00	3	160.00	40.0	20.00	C	1.4	0.31	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-W20-07	20.00	5.00	3	85.00	30.0	20.00	W	1.4	0.16	SR M2.5X5-T7-60	T-7/51
HM390 ETC D22-3-C20-07	22.00	5.00	3	110.00	30.0	20.00	C	1.0	0.21	SR M2.5X5-T7-60	T-7/51
HM390 ETC D22-3-C20-07-B	22.00	5.00	3	180.00	30.0	20.00	C	1.0	0.37	SR M2.5X5-T7-60	T-7/51
HM390 ETC D25-4-C25-07	25.00	5.00	4	120.00	35.0	25.00	C	1.0	0.36	SR M2.5X6-T7-60	T-7/51
HM390 ETC D25-4-W25-07	25.00	5.00	4	95.00	35.0	25.00	W	1.0	0.28	SR M2.5X6-T7-60	T-7/51
HM390 ETC D28-4-C25-07-B	28.00	5.00	4	200.00	35.0	25.00	C	0.9	0.64	SR M2.5X6-T7-60	T-7/51
HM390 ETC D32-5-C32-07	32.00	5.00	5	130.00	45.0	32.00	C	0.8	0.68	SR M2.5X6-T7-60	T-7/51
HM390 ETC D32-5-W32-07	32.00	5.00	5	110.00	45.0	32.00	W	0.8	0.56	SR M2.5X6-T7-60	T-7/51

• Insert clamping screw must be lubricated every indexing. • Tightening torque 0.9 Nxm. • For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

(3) Maximum ramping angle

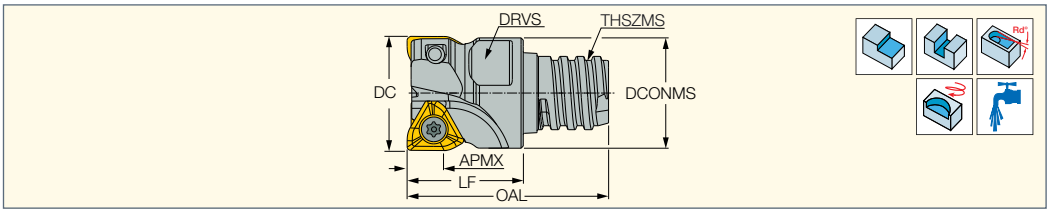
For inserts, see pages: HM390 TCKT/CT 0703 (446)

HELI3MILL HM390 LINE

MULTI-MASTER

HM390 ETC-MM

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying HM390 TCKT 0703 Triangular Inserts



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	kg		
HM390 ETC D16-2-MMT10-07	16.00	5.00	2	16.00	15.20	T10	27.30	13.0	1.9	0.02	SR M2.5X5-T7-60	T-7/51
HM390 ETC D20-3-MMT12-07	20.00	5.00	3	20.00	18.30	T12	33.30	16.0	1.4	0.04	SR M2.5X5-T7-60	T-7/51
HM390 ETC D25-4-MMT15-07	25.00	5.00	4	25.00	23.90	T15	42.00	20.0	1.0	0.08	SR M2.5X6-T7-60	T-7/51

• Insert clamping screw must be lubricated every indexing. • Tightening torque 0.9 Nxm. • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

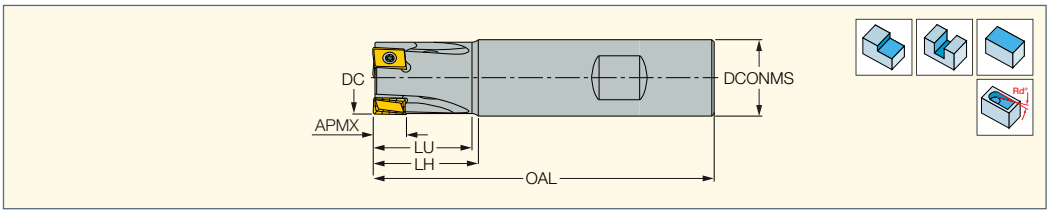
For inserts, see pages: HM390 TCKT/CT 0703 (446)

For holders, see pages: MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

HELITANG T490 LINE

T490 ELN-08

90° Endmills Carrying Tangentially Clamped Inserts with 4 Helical, 8 mm Long Cutting Edges



Designation	DC	CICT(1)	LH	LU	APMX	OAL	DCONMS	Shank(2)	CSP(3)	RMPX°(4)	RMPX°_2(5)	kg		
T490 ELN D16-2-C15-08B	16.00	2	41.0	40.0	8.00	150.00	15.00	C	1	2.0	1.1	0.18	SR 10502813-HGSM	IP-7/51
T490 ELN D16-2-C16-08	16.00	2	28.0	26.0	8.00	90.00	16.00	C	0	2.0	1.1	0.13	SR 10502813-HGSM	IP-7/51
T490 ELN D16-2-C16-08C	16.00	2	28.0	26.0	8.00	90.00	16.00	C	1	2.0	1.1	0.12	SR 10502813-HGSM	IP-7/51
T490 ELN D16-2-W16-08	16.00	2	28.0	26.0	8.00	85.00	16.00	W	0	2.0	1.1	0.12	SR 10502813-HGSM	IP-7/51
T490 ELN D16-2-W16-08C	16.00	2	28.0	26.0	8.00	85.00	16.00	W	1	2.0	1.1	0.11	SR 10502813-HGSM	IP-7/51
T490 ELN D18-2-C20-08C	18.00	2	28.0	26.0	8.00	90.00	20.00	C	1	1.8	1.0	0.18	SR 10502813-HGSM	IP-7/51
T490 ELN D20-2-C19-08B	20.00	2	41.0	40.0	8.00	160.00	19.00	C	1	1.7	0.8	0.31	SR 10502813-HG-M	IP-7/51
T490 ELN D20-2-C20-08C	20.00	2	28.0	26.0	8.00	110.00	20.00	C	1	1.7	0.8	0.23	SR 10502813-HG-M	IP-7/51
T490 ELN D20-2-W20-08C	20.00	2	28.0	26.0	8.00	90.00	20.00	W	1	1.7	0.8	0.19	SR 10502813-HG-M	IP-7/51
T490 ELN D20-3-C20-08	20.00	3	28.0	26.0	8.00	110.00	20.00	C	0	1.7	0.8	0.25	SR 10502813-HG-M	IP-7/51
T490 ELN D20-3-C20-08C	20.00	3	28.0	26.0	8.00	110.00	20.00	C	1	1.7	0.8	0.23	SR 10502813-HG-M	IP-7/51
T490 ELN D20-3-W20-08	20.00	3	28.0	26.0	8.00	90.00	20.00	W	0	1.7	0.8	0.20	SR 10502813-HG-M	IP-7/51
T490 ELN D20-3-W20-08C	20.00	3	28.0	26.0	8.00	90.00	20.00	W	1	1.7	0.8	0.18	SR 10502813-HG-M	IP-7/51
T490 ELN D22-3-C20-08C	22.00	3	28.0	30.0	8.00	110.00	20.00	C	1	-	-	0.24	SR 10502813-HG-M	IP-7/51
T490 ELN D25-3-C24-08B	25.00	3	41.0	40.0	8.00	200.00	24.00	C	1	-	-	0.61	SR 10502813-HG-M	IP-7/51
T490 ELN D25-3-C25-08C	25.00	3	28.0	26.0	8.00	120.00	25.00	C	1	-	-	0.39	SR 10502813-HG-M	IP-7/51
T490 ELN D25-3-W25-08C	25.00	3	28.0	26.0	8.00	95.00	25.00	W	1	-	-	0.30	SR 10502813-HG-M	IP-7/51
T490 ELN D25-4-C25-08	25.00	4	28.0	26.0	8.00	120.00	25.00	C	0	-	-	0.43	SR 10502813-HG-M	IP-7/51
T490 ELN D25-4-C25-08C	25.00	4	28.0	26.0	8.00	120.00	25.00	C	1	-	-	0.39	SR 10502813-HG-M	IP-7/51
T490 ELN D25-4-W25-08	25.00	4	28.0	26.0	8.00	95.00	25.00	W	0	-	-	0.33	SR 10502813-HG-M	IP-7/51
T490 ELN D25-4-W25-08C	25.00	4	28.0	26.0	8.00	95.00	25.00	W	1	-	-	0.30	SR 10502813-HG-M	IP-7/51
T490 ELN D32-3-C32-08C	32.00	3	32.0	30.0	8.00	130.00	32.00	C	1	-	-	0.72	SR 10502813-HG-M	IP-7/51
T490 ELN D32-3-W32-08C	32.00	3	32.0	30.0	8.00	110.00	32.00	W	1	-	-	0.60	SR 10502813-HG-M	IP-7/51
T490 ELN D32-4-C32-08B	32.00	4	32.0	30.0	8.00	200.00	32.00	C	1	-	-	1.14	SR 10502813-HG-M	IP-7/51
T490 ELN D32-5-C32-08C	32.00	5	32.0	30.0	8.00	130.00	32.00	C	1	-	-	0.73	SR 10502813-HG-M	IP-7/51
T490 ELN D32-5-W32-08C	32.00	5	32.0	30.0	8.00	110.00	32.00	W	1	-	-	0.60	SR 10502813-HG-M	IP-7/51
T490 ELN D40-4-C32-08C	40.00	4	-	30.0	8.00	130.00	32.00	C	1	-	-	0.81	SR 10502813-HG-M	IP-7/51
T490 ELN D40-6-C32-08C	40.00	6	-	30.0	8.00	130.00	32.00	C	1	-	-	0.82	SR 10502813-HG-M	IP-7/51
T490 ELN D40-6-W32-08C	40.00	6	-	30.0	8.00	110.00	32.00	W	1	-	-	0.69	SR 10502813-HG-M	IP-7/51

• "B" suffix with long cylindrical shank which may be shortened. • For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

(3) 0 - Without coolant supply, 1 - With coolant supply

(4) Maximum ramping angle - valid only with T490 LNHT 080404PNR-RD inserts

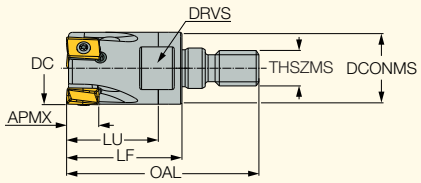
(5) Maximum ramping angle - valid only with T490 LNMT 080404PNR-RD inserts

For inserts, see pages: T490 LNAR-P (480) • T490 LNMT/LNHT 0804 (476)

HELITANG T490 LINE FLEXFIT

T490 ELN-M-08

90° Endmills with a FLEXFIT Threaded Adaptation Carrying Tangentially Clamped Inserts



Designation	DC	CICT(1)	APMX	DCONMS	LU	LF	OAL	THSZMS	DRVS(2)	RMPX°(3)	RMPX°_2(4)	Insert	TQ_3(5)	kg
T490 ELN D16-2-M10	16.00	2	8.00	18.00	22.0	30.00	50.00	M10	12.7	2.0	1.1	T490 LN.. 08	29	0.04
T490 ELN D20-3-M10	20.00	3	8.00	18.70	-	30.00	50.00	M10	15.0	1.7	0.8	T490 LN.. 08	29	0.06
T490 ELN D25-3-M12	25.00	3	8.00	21.00	-	28.00	50.00	M12	17.0	-	-	T490 LN.. 08	33	0.08
T490 ELN D25-4-M12	25.00	4	8.00	21.00	-	28.00	50.00	M12	17.0	-	-	T490 LN.. 08	33	0.08
T490 ELN D32-3-M16-13	32.00	3	12.50	29.00	-	45.00	70.00	M16	25.0	-	-	T490 LN.. 13	40	0.22
T490 ELN D32-5-M16	32.00	5	8.00	29.00	-	30.00	55.00	M16	25.0	-	-	T490 LN.. 08	40	0.16

• For adaptation see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle - valid only with T490 LNHT 080404PNR-RD inserts

(4) Maximum ramping angle - valid only with T490 LNMT 080404PNR-RD inserts

(5) Tool tightening torque Nxm (lbfxin)

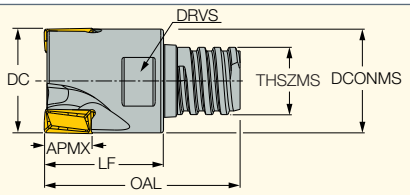
For inserts, see pages: T490 LNAR-P (480) • T490 LNMT/LNHT 0804 (476)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

HELITANG T490 LINE
MULTI-MASTER

T490 ELN-MM-08

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying Tangentially Clamped Inserts



Designation	DC	CICT(1)	APMX	DCONMS	LF	OAL	THSZMS	DRVS(2)	RMPX°(3)	RMPX°_2(4)	kg		
T490 ELN D16-2-MMT10	16.00	2	8.00	14.70	20.00	32.00	T10	13.0	2.0	1.1	0.03	SR 10502813-HGSM	IP-7/51
T490 ELN D20-2-MMT12	20.00	2	8.00	18.70	21.50	35.00	T12	16.0	1.7	0.8	0.05	SR 10502813-HG-M	IP-7/51
T490 ELN D20-3-MMT12	20.00	3	8.00	18.70	21.50	35.00	T12	16.0	1.7	0.8	0.05	SR 10502813-HG-M	IP-7/51

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle - valid only with T490 LNHT 080404PNR-RD inserts

(4) Maximum ramping angle - valid only with T490 LNMT 080404PNR-RD inserts

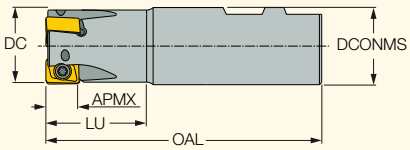
For inserts, see pages: T490 LNAR-P (480) • T490 LNMT/LNHT 0804 (476)

For holders, see pages: MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

HELIDO 490 LINE

H490 E90AX-09

90° Endmills Carrying H490 ANKX 09... Double-Sided Rectangular Inserts with 4 Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LU	DCONMS	Shank(2)	kg			
H490 E90AX D16-2-C15-09-B	16.00	2	8.00	150.00	40.0	15.00	C	0.18	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D16-2-C16-09	16.00	2	8.00	90.00	26.0	16.00	C	0.12	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D16-2-W16-09	16.00	2	8.00	85.00	26.0	16.00	W	0.11	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D18-2-C16-09	18.00	2	8.00	90.00	25.0	16.00	C	0.12	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D20-2-C19-09-B	20.00	2	8.00	160.00	40.0	19.00	C	0.31	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D20-2-C20-09	20.00	2	8.00	110.00	26.0	20.00	C	0.23	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D20-2-W20-09	20.00	2	8.00	90.00	26.0	20.00	W	0.18	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D20-3-C20-09	20.00	3	8.00	110.00	26.0	20.00	C	0.23	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D20-3-W20-09	20.00	3	8.00	90.00	26.0	20.00	W	0.18	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D22-3-C20-09	22.00	3	8.00	115.00	25.0	20.00	C	0.25	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D25-3-C24-09-B	25.00	3	8.00	200.00	40.0	24.00	C	0.61	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D25-3-C25-09	25.00	3	8.00	120.00	26.0	25.00	C	0.39	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D25-3-W25-09	25.00	3	8.00	95.00	26.0	25.00	W	0.30	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D25-4-C25-09	25.00	4	8.00	120.00	26.0	25.00	C	0.39	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D25-4-W25-09	25.00	4	8.00	95.00	26.0	25.00	W	0.30	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D32-4-W32-09	32.00	4	8.00	110.00	30.0	32.00	W	0.60	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D32-5-C32-09	32.00	5	8.00	130.00	30.0	32.00	C	0.72	SR 10508082-HG	SW4-SD	BLD T08/M7
H490 E90AX D32-5-W32-09	32.00	5	8.00	110.00	30.0	32.00	W	0.60	SR 10508082-HG	SW4-SD	BLD T08/M7

• For user guide see pages 542-548 • "B" Suffix cylindrical shank which may be shortened

(1) Number of inserts

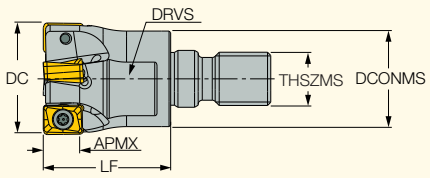
(2) C-Cylindrical, W-Weldon

For inserts, see pages: H490 ANKX 0904-FF (470) • H490 ANKX/ANCX-09 (469)

HELIDO 490 LINE FLEXFIT

H490 E90AX-M

90° Endmills with a FLEXFIT Threaded Connection Carrying H490 ANKX/ANCX 09... Double-Sided Rectangular Inserts



Designation	DC	CICT(1)	APMX	LF	DHUB	THSZMS	DRVS(2)	TQ_3(3)	kg			
H490 E90AX D20-3-M10-09	20.00	3	8.00	30.00	18.70	M10	16.0	29	0.06	SR 10508082-HG	BLD T08/M7	SW4-SD
H490 E90AX D25-4-M12-09	25.00	4	8.00	28.00	21.00	M12	17.0	33	0.07	SR 10508082-HG	BLD T08/M7	SW4-SD
H490 E90AX D32-5-M16-09	32.00	5	8.00	30.00	29.00	M16	25.0	40	0.16	SR 10508082-HG	BLD T08/M7	SW4-SD

• For adaptation see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Clamping wrench size

(3) Tool tightening torque Nxm (lbfxin)

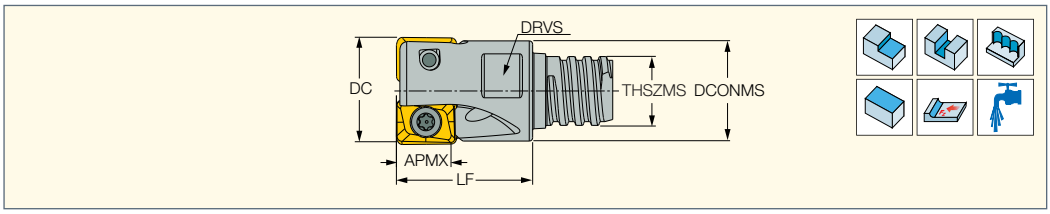
For inserts, see pages: H490 ANKX 0904-FF (470) • H490 ANKX/ANCX-09 (469)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

HELIDO 490 LINE
MULTI-MASTER

H490 E90AX-MM

90° Endmills with a MULTI-MASTER Threaded Connection Carrying H490 ANKX/ANCX 090... Double-Sided Rectangular Inserts



Designation	DC	CICT(1)	APMX	LF	DCONMS	THSZMS	DRVS(2)	kg			
H490 E90AX D20-3-MMT12-09	20.00	3	8.00	24.70	18.70	T12	16.0	0.05	SR 10508082-HG	BLD T08/M7	SW4-SD

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Clamping wrench size

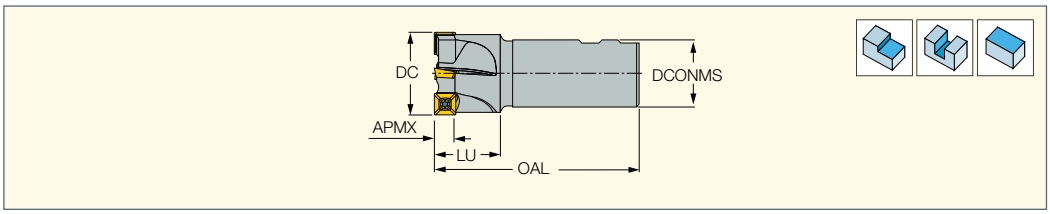
For inserts, see pages: H490 ANKX 0904-FF (470) • H490 ANKX/ANCX-09 (469)

For holders, see pages: MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

HELIQUAD

E90SP

Endmills Carrying Square S/XPMT Inserts



Designation	DC	CICT(1)	APMX	LU	OAL	DCONMS	Shank(2)	kg			
E90SP D25-02-C25-10	25.00	2	9.60	32.0	110.00	25.00	C	0.35	SR 10514114	SW6-T-SH	BLD IP15/M7
E90SP D25-02-W25-10	25.00	2	9.60	32.0	95.00	25.00	W	0.29	SR 10514114	BLD IP15/M7	SW6-T-SH
E90SP D25-03-C25-10	25.00	3	9.60	32.0	110.00	25.00	C	0.76	SR 10514114	SW6-T-SH	BLD IP15/M7
E90SP D25-03-W25-10	25.00	3	9.60	32.0	95.00	25.00	W	0.00	SR 10514114	BLD IP15/M7	SW6-T-SH
E90SP D32-03-C32-10	32.00	3	9.60	32.0	130.00	32.00	C	0.69	SR 10514114	SW6-T-SH	BLD IP15/M7
E90SP D32-03-W25-10	32.00	3	9.60	31.8	95.00	25.00	W	0.00	SR 10514114	BLD IP15/M7	SW6-T-SH
E90SP D40-04-C32-10	40.00	4	9.60	32.0	130.00	32.00	C	0.00	SR 10514114	SW6-T-SH	BLD IP15/M7
E90SP D40-04-W32-10	40.00	4	9.60	32.0	110.00	32.00	W	0.00	SR 10514114	BLD IP15/M7	SW6-T-SH
E90SP D50-06-C32-10	50.00	6	9.60	35.0	130.00	32.00	C	0.00	SW6-T-SH	BLD IP15/M7	SR 10514114

• For user guide see pages 542-548

(1) Number of inserts

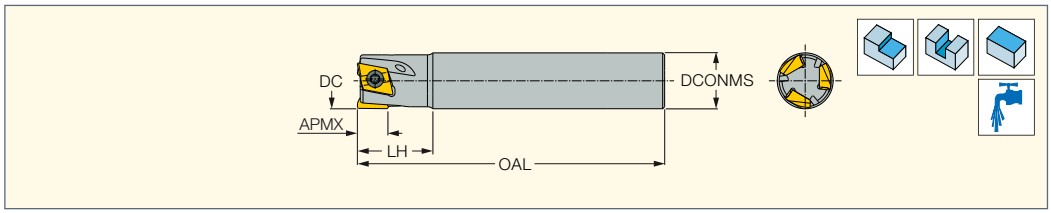
(2) C-Cylindrical, W-Weldon

For inserts, see pages: QPMR 1004-HQ-M (495) • QPMT 100408PDTN (495) • SPCT/SPMR PDR (496) • SPMT-HQ (495) • XPMT-HQ (496)

SUMOMILL 290 LINE

T290 ELN-10

Endmills Carrying Tangentially Clamped Inserts



Designation	DC	CICT(1)	OAL	LH	APMX	DCONMS	Shank(2)	kg			
T290 ELN D20-02-C20-10	20.00	2	110.00	27.0	10.00	20.00	C	0.22	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D20-03-C20-10	20.00	3	110.00	27.0	10.00	20.00	C	0.23	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D20-03-W20-10	20.00	3	90.00	28.0	10.00	20.00	W	0.18	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D25-03-C25-10-XL	25.00	3	150.00	30.0	10.00	25.00	C	0.51	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D25-04-C25-10	25.00	4	120.00	28.0	10.00	25.00	C	0.40	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D25-04-W25-10	25.00	4	95.00	30.0	10.00	25.00	W	0.30	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D32-04-C32-10-XL	32.00	4	150.00	30.0	10.00	32.00	C	0.85	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D32-05-C32-10	32.00	5	130.00	28.0	10.00	32.00	C	0.73	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D32-05-W32-10	32.00	5	110.00	30.0	10.00	32.00	W	0.60	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D40-05-C32-10-XL	40.00	5	150.00	30.0	10.00	32.00	C	0.88	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D40-06-C32-10	40.00	6	130.00	30.0	10.00	32.00	C	0.75	SR 10504970	BLD IP15/M7	SW6-T-SH
T290 ELN D40-06-W32-10	40.00	6	110.00	30.0	10.00	32.00	W	0.63	SR 10504970	BLD IP15/M7	SW6-T-SH

• For user guide see pages 542-548

(1) Number of inserts

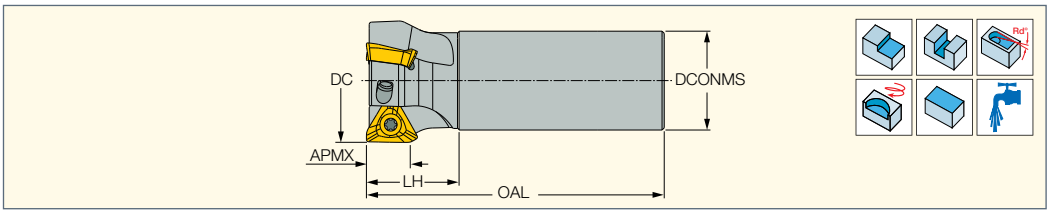
(2) C-Cylindrical, W-Weldon

For inserts, see pages: T290 LNMT/LNHT 1004 (474)

HELI3MILL HM390 LINE

HM390 ETP-10

90° Endmills Carrying HM390 TPKT 1003 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg			
HM390 ETP D25-2-C25-10	25.00	8.00	2	120.00	25.0	25.00	C	2.9	0.38	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-2-W25-10	25.00	8.00	2	95.00	25.0	25.00	W	2.9	0.30	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-3-C24-10-B	25.00	8.00	3	200.00	25.0	24.00	C	2.9	0.60	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-3-C25-10	25.00	8.00	3	120.00	25.0	25.00	C	2.9	0.38	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-3-C25-10-B	25.00	8.00	3	200.00	40.0	25.00	C	2.9	0.66	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-3-W25-10	25.00	8.00	3	95.00	25.0	25.00	W	2.9	0.30	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D25-4-C25-10	25.00	8.00	4	120.00	25.0	25.00	C	2.9	0.38	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D28-3-C25-10	28.00	8.00	3	120.00	25.0	25.00	C	2.5	0.40	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D28-3-C25-10-B	28.00	8.00	3	200.00	25.0	25.00	C	2.5	0.67	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-3-C31-10-B	32.00	8.00	3	250.00	30.0	31.00	C	2.1	1.33	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-3-C32-10	32.00	8.00	3	130.00	30.0	32.00	C	2.1	0.71	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-3-W32-10	32.00	8.00	3	110.00	30.0	32.00	W	2.1	0.58	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-4-C32-10	32.00	8.00	4	130.00	30.0	32.00	C	2.1	0.70	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-4-C32-10-B	32.00	8.00	4	200.00	40.0	32.00	C	2.1	1.11	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-4-W32-10	32.00	8.00	4	110.00	30.0	32.00	W	2.1	0.58	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D40-5-C32-10	40.00	8.00	5	130.00	30.0	32.00	C	1.6	0.76	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D40-5-W32-10	40.00	8.00	5	110.00	30.0	32.00	W	1.6	0.64	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D50-6-C32-10	50.00	8.00	6	130.00	38.0	32.00	C	1.2	0.86	SR 14-562/S	BLD T10/S7	SW6-SD

• For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

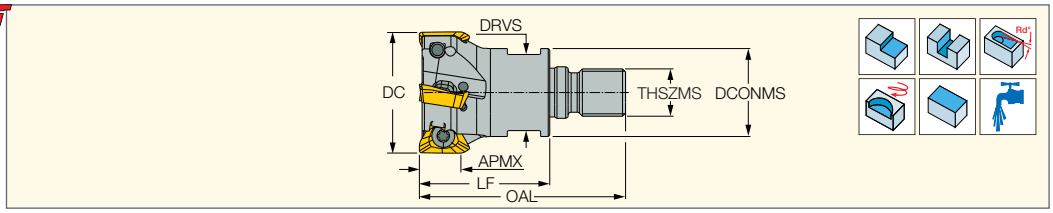
(3) Maximum ramping angle

For inserts, see pages: HM390 TPKT/CT 1003 (447)

HELI3MILL HM390 LINE FLEXFIT

HM390 ETP-M

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM90 TPKT 1003... Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	TQ_3(4)	kg			
HM390 ETP D25-3-M12	25.00	8.00	3	35.00	21.00	M12	57.00	18.0	2.9	33	0.08	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D32-4-M16	32.00	8.00	4	35.00	29.00	M16	60.00	25.0	2.1	40	0.16	SR 14-562/S	BLD T10/S7	SW6-SD

• For adaptation see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

(4) Tool tightening torque Nxm (lbfxin)

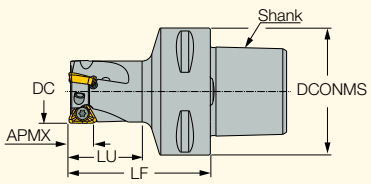
For inserts, see pages: HM390 TPKT/CT 1003 (447)

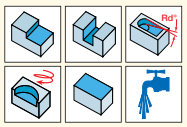
For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

HELI3MILL CAMFIX HM390 LINE

HM390 ETP-C#-10

90° Endmills Carrying HM390 TPKT 1003 Triangular Inserts with 3 Helical Cutting Edges





Designation	DCONMS	DC	APMX	CICT(1)	LU	LF	RMPX°(2)	Shank	CDI	kg			
HM390 ETP D25-3-L39-C3-10	32.00	25.00	8.00	3	39.0	55.00	2.9	CAMFIX	0	0.21	SR 14-562/S	BLD T10/S7	SW6-SD
HM390 ETP D66-7-L52-C6-10	63.00	66.00	8.00	7	52.0	75.00	0.8	CAMFIX	1	1.80	SR 14-562/S	BLD T10/S7	SW6-SD

• For user guide see pages 542-548

(1) Number of inserts

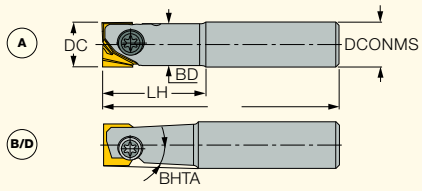
(2) Maximum ramping angle

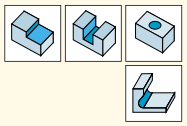
For inserts, see pages: HM390 TPKT/CT 1003 (447)

BALLPLUS

HCE

Multifunction Endmills that Can Carry Several Insert Geometries





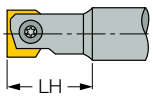
Designation	DC	LH	OAL	BD	DCONMS	Shank(1)	BHTA	Type	kg			
HCE D12-A-L120-C12	12.00	30.0	120.00	11.10	12.00	C	-	A	0.10	SR 34-540	BLD T15/S7	SW6-T
HCE D12-B-L160-C20	12.00	50.0	160.00	-	20.00	C	4.6	B	0.41	SR 34-540	BLD T15/S7	SW6-T
HCE D12-D-L160-C16	12.00	60.0	160.00	-	16.00	C	1.9	D	0.21	SR 34-540	BLD T15/S7	SW6-T
HCE D16-A-L130-C16	16.00	36.0	130.00	14.90	16.00	C	-	A	0.19	SR 105739	BLD T20/S7	SW6-T
HCE D16-B-L160-C25	16.00	60.0	160.00	-	25.00	C	4.3	B	0.50	SR 105739	BLD T20/S7	SW6-T
HCE D16-D-L160-C20	16.00	65.0	160.00	-	20.00	C	1.7	D	0.32	SR 105739	BLD T20/S7	SW6-T
HCE D20-A-L150-C20	20.00	60.0	150.00	18.80	20.00	C	-	A	0.33	SR 1052964	BLD T25/S7	SW6-T
HCE D20-D-L200-C25	20.00	90.0	200.00	-	25.00	C	1.6	D	0.62	SR 1052964	BLD T25/S7	SW6-T
HCE D25-A-L170-C25	25.00	70.0	170.00	23.00	25.00	C	-	A	0.57	SR 1051666	BLD T25/S7	SW6-T
HCE D25-D-L250-C32	25.00	125.0	250.00	-	32.00	C	1.6	D	1.20	SR 1051666	BLD T25/S7	SW6-T

• For undercutting, use HTR inserts only • The dimensions are for HCC inserts with RE=0.5 mm • For user guide see pages 542-548

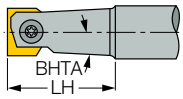
(1) C-Cylindrical

For inserts, see pages: HCC-QF (534)

Type A



Type B, D

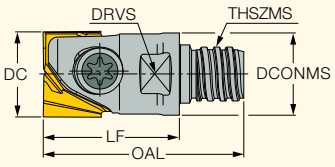


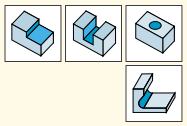
BALLPLUS

MULTI-MASTER

HCE-MM

Multifunction Endmills with a MULTI-MASTER Threaded Adaptation that Can Carry Several Insert Geometries





Designation	DC	OAL	LF	APMX	THSZMS	DCONMS	DRVS(1)	TQ	kg			
HCE D12/.50-MMT08	12.00	28.00	20.00	8.10	T08	11.50	10.0	15.0	0.01	SR 34-540	BLD T15/S7	SW6-T
HCE D16/.62-MMT10	16.00	36.75	25.00	10.30	T10	15.20	13.0	28.0	0.03	SR 105739	BLD T20/S7	SW6-T
HCE D20/.75-MMT12	20.00	48.80	35.00	12.80	T12	18.50	15.0	28.0	0.06	SR 1052964	BLD T25/S7	SW6-T

• For undercutting, use HTR inserts only • The dimensions are for HCC inserts with RE=0.5 mm • Do not apply lubricant to the MULTI-MASTER threaded connection

• For adaptation options, see page 44 • For user guide see pages 542-548

(1) Width across flats (wrench should be ordered separately)

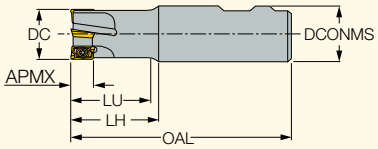
For inserts, see pages: HCC-QF (534)

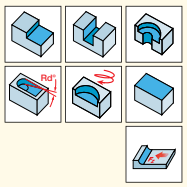
For holders, see pages: MM CAB (667) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

HELI2000

HM90 E90A-10

Endmills Carrying HM90
AP.. 1003... Inserts





Designation	DC	CICT[1]	APMX	OAL	LH	LU	RMPX°[2]	DCONMS	Shank[3]	CSP[4]	RPMX[5]	kg
HM90 E90A-D10-1-C10	10.00	1	10.00	80.00	20.0	13.8	5.0	10.00	C	0	132843	0.04
HM90 E90A-D10-1-C10-C	10.00	1	10.00	80.00	20.0	13.8	5.0	10.00	C	1	131850	0.04
HM90 E90A-D10-1-C16-LB	10.00	1	10.00	160.00	30.0	13.8	5.0	16.00	C	0	132843	0.22
HM90 E90A-D10-1-W16	10.00	1	10.00	80.00	20.0	10.6	5.0	16.00	W	0	132843	0.10
HM90 E90A-D12-1-C16	12.00	1	10.00	80.00	20.0	14.0	32.0	16.00	C	0	92536	0.11
HM90 E90A-D12-1-C16-C	12.00	1	10.00	80.00	20.0	14.0	32.0	16.00	C	1	92536	0.10
HM90 E90A-D12-1-C16-LB	12.00	1	10.00	160.00	30.0	16.0	32.0	16.00	C	0	92536	0.23
HM90 E90A-D12-1-W16	12.00	1	10.00	80.00	20.0	14.0	32.0	16.00	W	0	92536	0.11
HM90 E90A-D12-1-W16-C	12.00	1	10.00	80.00	20.0	14.0	32.0	16.00	W	1	92536	0.10
HM90 E90A-D14-1-C16	14.00	1	10.00	80.00	23.0	18.4	7.0	16.00	C	0	75930	0.11
HM90 E90A-D14-1-W16	14.00	1	10.00	80.00	23.0	18.4	7.0	16.00	W	0	75930	0.11
HM90 E90A-D16-2-C15-B	16.00	2	10.00	150.00	25.0	24.4	15.0	15.00	C	0	66712	0.19
HM90 E90A-D16-2-C15-B-C	16.00	2	10.00	150.00	25.0	24.4	15.0	15.00	C	1	66712	0.17
HM90 E90A-D16-2-C16	16.00	2	10.00	90.00	26.0	25.2	15.0	16.00	C	0	66712	0.12
HM90 E90A-D16-2-C16-B	16.00	2	10.00	150.00	40.0	38.2	15.0	16.00	C	0	66712	0.22
HM90 E90A-D16-2-C16-B-C	16.00	2	10.00	150.00	40.0	38.2	15.0	16.00	C	1	66712	0.20
HM90 E90A-D16-2-C16-C	16.00	2	10.00	90.00	26.0	25.2	15.0	16.00	C	1	66712	0.11
HM90 E90A-D16-2-C16-LB	16.00	2	10.00	180.00	40.0	38.1	15.0	16.00	C	0	66712	0.26
HM90 E90A-D16-2-W16	16.00	2	10.00	85.00	26.0	25.2	15.0	16.00	W	0	66712	0.12
HM90 E90A-D16-2-W16-C	16.00	2	10.00	85.00	26.0	25.2	15.0	16.00	W	1	66712	0.11
HM90 E90A-D17-2-C16	17.00	2	10.00	90.00	28.0	27.0	15.0	16.00	C	0	63393	0.13
HM90 E90A-D17-2-C16-L170	17.00	2	10.00	170.00	27.0	-	4.5	16.00	C	0	63393	0.25
HM90 E90A-D18-2-C16	18.00	2	10.00	90.00	26.0	-	7.5	16.00	C	0	60361	0.13
HM90 E90A-D18-2-C16-C	18.00	2	10.00	90.00	26.0	-	7.5	16.00	C	1	60361	0.12
HM90 E90A-D18-2-W20	18.00	2	10.00	90.00	30.0	26.4	7.5	20.00	W	0	60361	0.18
HM90 E90A-D18-2-W20-C	18.00	2	10.00	90.00	30.0	26.4	7.5	20.00	W	1	60361	0.17
HM90 E90A-D19-2-C20	19.00	2	10.00	90.00	26.0	25.0	7.5	20.00	C	0	57727	0.19
HM90 E90A-D20-2-C19-B	20.00	2	10.00	160.00	25.0	-	7.5	19.00	C	0	55578	0.33
HM90 E90A-D20-2-C19-B-C	20.00	2	10.00	160.00	25.0	-	7.5	19.00	C	1	55578	0.30
HM90 E90A-D20-2-C20	20.00	2	10.00	110.00	26.0	25.3	7.5	20.00	C	0	55578	0.24
HM90 E90A-D20-2-C20-B	20.00	2	10.00	160.00	40.0	38.0	7.5	20.00	C	0	55578	0.36
HM90 E90A-D20-2-C20-B-C	20.00	2	10.00	160.00	40.0	38.0	7.5	20.00	C	1	55578	0.33
HM90 E90A-D20-2-C20-C	20.00	2	10.00	110.00	26.0	25.3	7.5	20.00	C	1	55578	0.22
HM90 E90A-D20-2-C20-LB	20.00	2	10.00	200.00	40.0	38.0	7.5	20.00	C	0	55578	0.46
HM90 E90A-D20-2-C20-XL	20.00	2	10.00	130.00	60.0	59.0	7.5	20.00	C	0	55578	0.27
HM90 E90A-D20-2-W20	20.00	2	10.00	90.00	26.1	25.0	7.5	20.00	W	0	55578	0.19
HM90 E90A-D20-2-W20-C	20.00	2	10.00	90.00	26.1	25.0	7.5	20.00	W	1	55578	0.18
HM90 E90A-D20-2-W20-XL	20.00	2	10.00	130.00	60.0	59.0	7.5	20.00	W	0	55578	0.27
HM90 E90A-D20-3-C20	20.00	3	10.00	110.00	26.1	25.0	7.5	20.00	C	0	55578	0.24
HM90 E90A-D20-3-C20-C	20.00	3	10.00	110.00	26.1	25.0	7.5	20.00	C	1	55578	0.22
HM90 E90A-D20-3-W16	20.00	3	10.00	85.00	26.1	-	7.5	16.00	W	0	55578	0.13
HM90 E90A-D20-3-W16-C	20.00	3	10.00	85.00	26.1	-	7.5	16.00	W	1	55578	0.12
HM90 E90A-D20-3-W20	20.00	3	10.00	90.00	26.1	25.0	7.5	20.00	W	0	55578	0.19
HM90 E90A-D20-3-W20-C	20.00	3	10.00	90.00	26.1	25.0	7.5	20.00	W	1	55578	0.18
HM90 E90A-D21-2-C20-L270	21.00	2	10.00	270.00	26.0	-	2.8	20.00	C	0	53729	0.64
HM90 E90A-D21-3-C20	21.00	3	10.00	115.00	26.0	25.0	7.5	20.00	C	0	53729	0.26
HM90 E90A-D22-3-C20	22.00	3	10.00	115.00	26.0	-	7.5	20.00	C	0	51846	0.26
HM90 E90A-D22-3-C20-C	22.00	3	10.00	115.00	26.0	-	7.5	20.00	C	1	51846	0.25
HM90 E90A-D22-3-W25	22.00	3	10.00	95.00	26.0	21.0	7.5	25.00	W	0	51846	0.31
HM90 E90A-D22-3-W25-C	22.00	3	10.00	95.00	26.0	21.0	7.5	25.00	W	1	51846	0.29
HM90 E90A-D25-2-C25	25.00	2	10.00	120.00	26.1	25.0	2.5	25.00	C	0	47512	0.42
HM90 E90A-D25-2-W25	25.00	2	10.00	95.00	26.1	25.0	2.5	25.00	W	0	47512	0.32
HM90 E90A-D25-3-C24-B	25.00	3	10.00	200.00	25.0	-	2.5	24.00	C	0	47512	0.67
HM90 E90A-D25-3-C24-B-C	25.00	3	10.00	200.00	25.0	24.0	2.5	24.00	C	1	47512	0.64
HM90 E90A-D25-3-C25	25.00	3	10.00	120.00	26.1	25.0	2.5	25.00	C	0	47512	0.42

• For user guide see pages 542-548

[1] Number of inserts

[2] Maximum ramping angle

[3] C-Cylindrical, W-Weldon

[4] 0 - Without coolant supply, 1 - With coolant supply

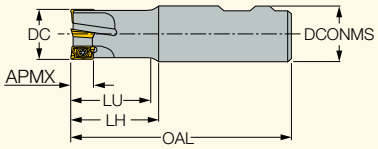
[5] Maximum RPM

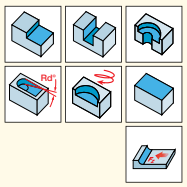
For inserts, see pages: APCR 1003PDFR-P (450) • APCT 1003PDR-HM (450) • APKR 1003PDR-HM (451) • APKT 1003..R (453) • APKT 1003..TR-RM (452) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • APKT 1003PDTR/L-RM (452) • APKT 1003R8T-FF (454) • APKW 100304 PDR (PCD) (450) • HM90 APCR 100304PDFR-P/DP (449) • HM90 APCT 1003 (448) • HM90 APKT 1003 (449) • HM90 APKT 1003PD-W (453) • HM90 APKW 1003PDR (453)

HELI2000

HM90 E90A-10 (continued)

Endmills Carrying HM90
AP.. 1003... Inserts





Designation	DC	CICT[1]	APMX	OAL	LH	LU	RMPX°[2]	DCONMS	Shank[3]	CSP[4]	RPMX[5]	kg
HM90 E90A-D25-3-C25-B	25.00	3	10.00	200.00	40.0	37.0	2.5	25.00	C	0	47512	0.72
HM90 E90A-D25-3-C25-B-C	25.00	3	10.00	200.00	40.0	37.0	2.5	25.00	C	1	47512	0.68
HM90 E90A-D25-3-C25-C	25.00	3	10.00	120.00	26.1	25.0	2.5	25.00	C	1	47512	0.39
HM90 E90A-D25-3-W25	25.00	3	10.00	95.00	26.1	25.0	2.5	25.00	W	0	47512	0.32
HM90 E90A-D25-3-W25-C	25.00	3	10.00	95.00	26.1	25.0	2.5	25.00	W	1	47512	0.30
HM90 E90A-D25-3-W25-XL	25.00	3	10.00	140.00	80.0	79.0	2.5	25.00	W	0	47512	0.47
HM90 E90A-D25-4-C25	25.00	4	10.00	120.00	26.0	25.0	2.5	25.00	C	0	47512	0.42
HM90 E90A-D25-4-C25-C	25.00	4	10.00	120.00	26.0	25.0	2.5	25.00	C	1	47512	0.39
HM90 E90A-D25-4-W25	25.00	4	10.00	95.00	26.0	25.0	2.5	25.00	W	0	47512	0.31
HM90 E90A-D25-4-W25-C	25.00	4	10.00	95.00	26.0	25.0	2.5	25.00	W	1	47512	0.30
HM90 E90A-D28-4-C25	28.00	4	10.00	120.00	26.0	-	2.0	25.00	C	0	44005	0.44
HM90 E90A-D28-4-C25-C	28.00	4	10.00	120.00	26.0	-	2.0	25.00	C	1	44005	0.41
HM90 E90A-D28-4-W25	28.00	4	10.00	95.00	26.0	-	2.0	25.00	W	0	44005	0.33
HM90 E90A-D30-4-C32	30.00	4	10.00	130.00	40.0	35.4	2.0	32.00	C	0	36782	0.72
HM90 E90A-D30-4-W25	30.00	4	10.00	95.00	30.0	-	2.0	25.00	W	0	36782	0.35
HM90 E90A-D30-4-W25-C	30.00	4	10.00	95.00	30.0	-	2.0	25.00	W	1	36782	0.33
HM90 E90A-D32-3-C32	32.00	3	10.00	130.00	30.0	28.5	3.0	32.00	C	0	35614	0.76
HM90 E90A-D32-3-W32	32.00	3	10.00	110.00	30.0	28.5	3.0	32.00	W	0	35614	0.63
HM90 E90A-D32-4-C32	32.00	4	10.00	130.00	30.0	28.5	3.0	32.00	C	0	35614	0.75
HM90 E90A-D32-4-C32-B	32.00	4	10.00	200.00	40.0	37.2	3.0	32.00	C	0	35614	1.18
HM90 E90A-D32-4-C32-LB	32.00	4	10.00	250.00	40.0	37.2	3.0	32.00	C	0	35614	1.50
HM90 E90A-D32-4-W25	32.00	4	10.00	95.00	30.0	-	3.0	25.00	W	0	35614	0.37
HM90 E90A-D32-4-W32-XL	32.00	4	10.00	160.00	100.0	28.5	3.0	32.00	W	0	35614	0.87
HM90 E90A-D32-5-C32	32.00	5	10.00	130.00	30.0	28.5	3.0	32.00	C	0	35614	0.75
HM90 E90A-D32-5-C32-C	32.00	5	10.00	130.00	30.0	28.5	3.0	32.00	C	1	35614	0.72
HM90 E90A-D32-5-W25	32.00	5	10.00	95.00	30.0	-	3.0	25.00	W	0	35614	0.37
HM90 E90A-D32-5-W25-C	32.00	5	10.00	95.00	30.0	-	3.0	25.00	W	1	35614	0.35
HM90 E90A-D32-5-W32-C	32.00	5	10.00	110.00	30.0	28.5	3.0	32.00	W	1	35614	0.60
HM90 E90A-D40-5-C32	40.00	5	10.00	130.00	30.0	-	2.7	32.00	C	0	31855	0.83
HM90 E90A-D40-5-W32-C	40.00	5	10.00	110.00	30.0	-	2.7	32.00	W	1	31855	0.68
HM90 E90A-D50-7-C32	50.00	7	10.00	130.00	41.6	-	2.7	32.00	C	0	28492	0.94

- For user guide see pages 542-548

[1] Number of inserts
[2] Maximum ramping angle
[3] C-Cylindrical, W-Weldon
[4] 0 - Without coolant supply, 1 - With coolant supply
[5] Maximum RPM

For inserts, see pages: APCR 1003PDFR-P (450) • APCT 1003PDR-HM (450) • APKR 1003PDR-HM (451) • APKT 1003..R (453) • APKT 1003..TR-RM (452) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • APKT 1003PDTR/L-RM (452) • APKT 1003R8T-FF (454) • APKW 100304 PDR (PCD) (450) • HM90 APCR 100304PDFR-P/DP (449) • HM90 APCT 1003 (448) • HM90 APKT 1003 (449) • HM90 APKT 1003PD-W (453) • HM90 APKW 1003PDR (453)

Spare Parts

Designation			
HM90 E90A-D10-1-C10	SR 34-505/HG	T-8/53	
HM90 E90A-D10-1-C10-C	SR 34-505/HG	T-8/53	
HM90 E90A-D10-1-C16-LB	SR 34-505/HG	T-8/53	
HM90 E90A-D10-1-W16	SR 34-505/HG	T-8/53	
HM90 E90A-D12-1-C16	SR 34-505/HG	T-8/53	
HM90 E90A-D12-1-C16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D12-1-C16-LB	SR 34-505/HG	T-8/53	
HM90 E90A-D12-1-W16	SR 34-505/HG	T-8/53	
HM90 E90A-D12-1-W16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D14-1-C16	SR 34-505/HG	T-8/53	
HM90 E90A-D14-1-W16	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D16-2-C15-B	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-C15-B-C	SR 34-505/HG	T-8/53	

Spare Parts

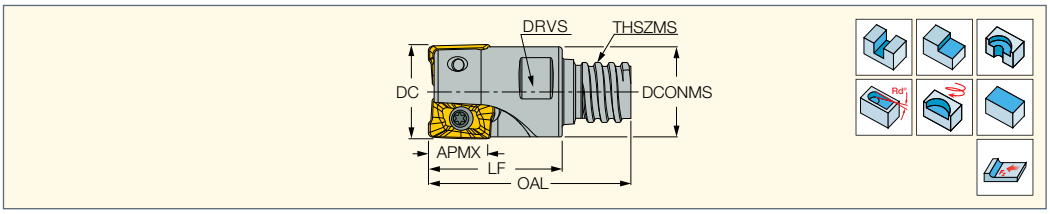
Designation			
HM90 E90A-D16-2-C16	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D16-2-C16-B	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-C16-B-C	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-C16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-C16-LB	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-W16	SR 34-505/HG	T-8/53	
HM90 E90A-D16-2-W16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D17-2-C16	SR 34-505/HG	T-8/53	
HM90 E90A-D17-2-C16-L170	SR 34-505/HG	T-8/53	
HM90 E90A-D18-2-C16	SR 34-505/HG	T-8/53	
HM90 E90A-D18-2-C16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D18-2-W20	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D18-2-W20-C	SR 34-505/HG	T-8/53	
HM90 E90A-D19-2-C20	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C19-B	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C19-B-C	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C20	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D20-2-C20-B	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C20-B-C	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C20-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D20-2-C20-LB	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-C20-XL	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-W20	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-W20-C	SR 34-505/HG	T-8/53	
HM90 E90A-D20-2-W20-XL	SR 34-505/HG	T-8/53	
HM90 E90A-D20-3-C20	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D20-3-C20-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D20-3-W16	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D20-3-W16-C	SR 34-505/HG	T-8/53	
HM90 E90A-D20-3-W20	SR 34-505/HG	T-8/53	
HM90 E90A-D20-3-W20-C	SR 34-505/HG	T-8/53	
HM90 E90A-D21-2-C20-L270	SR 34-505/HG	T-8/53	
HM90 E90A-D21-3-C20	SR 34-505/HG	T-8/53	
HM90 E90A-D22-3-C20	SR 34-505/HG	T-8/53	
HM90 E90A-D22-3-C20-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D22-3-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D22-3-W25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D25-2-C25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-2-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C24-B	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C24-B-C	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C25-B	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C25-B-C	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-C25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-W25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D25-3-W25-XL	SR 34-505/HG	T-8/53	
HM90 E90A-D25-4-C25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-4-C25-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D25-4-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D25-4-W25-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D28-4-C25	SR 34-505/HG	T-8/53	
HM90 E90A-D28-4-C25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D28-4-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D30-4-C32	SR 34-505/HG	T-8/53	
HM90 E90A-D30-4-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D30-4-W25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D32-3-C32	SR 34-505/HG	T-8/53	
HM90 E90A-D32-3-W32	SR 34-505/HG	T-8/53	
HM90 E90A-D32-4-C32	SR 34-505/HG	T-8/53	
HM90 E90A-D32-4-C32-B	SR 34-505/HG	T-8/53	
HM90 E90A-D32-4-C32-LB	SR 34-505/HG	T-8/53	
HM90 E90A-D32-4-W25	SR 34-505/HG	T-8/53	
HM90 E90A-D32-4-W32-XL	SR 34-505/HG	T-8/53	
HM90 E90A-D32-5-C32	SR 34-505/HG	T-8/53	
HM90 E90A-D32-5-C32-C	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D32-5-W25	SR 34-505/HG	SW4-SD	BLD T08/M7
HM90 E90A-D32-5-W25-C	SR 34-505/HG	T-8/53	
HM90 E90A-D32-5-W32-C	SR 34-505/HG	T-8/53	
HM90 E90A-D40-5-C32	SR 34-505/HG	T-8/53	
HM90 E90A-D40-5-W32-C	SR 34-505/HG	T-8/53	
HM90 E90A-D50-7-C32	SR 34-505/HG	T-8/53	

HELI2000

MULTI-MASTER

HM90 E90A-MM-10

90° Endmills with a MULTI-MASTER Threaded Adaptation Carrying HM90 AP.. 1003... Inserts



Designation	DC	CICT(1)	APMX	OAL	RMPX°(2)	LF	THSZMS	DRVS(3)	DCONMS	kg		
HM90 E90A-D16-2-MMT10	16.00	2	10.00	34.75	15.0	23.00	T10	13.0	15.30	0.03	SR 34-505/HG	T-8/53
HM90 E90A-D20-2-MMT12	20.00	2	10.00	38.30	7.5	24.60	T12	16.0	19.20	0.05	SR 34-505/HG	T-8/53
HM90 E90A-D20-3-MMT12	20.00	3	10.00	38.30	7.5	24.60	T12	16.0	19.20	0.05	SR 34-505/HG	T-8/53

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Maximum ramping angle

(3) Clamping wrench size

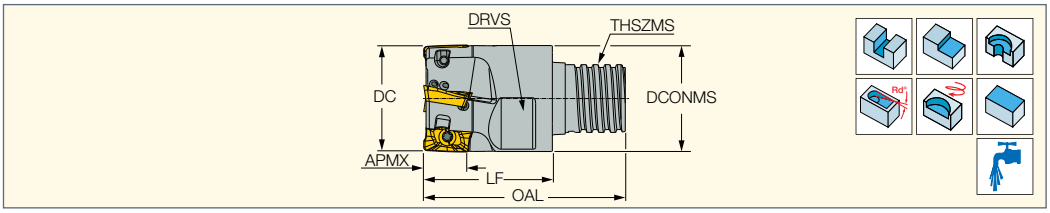
For inserts, see pages: APCR 1003PDFR-P (450) • APCT 1003PDR-HM (450) • APKR 1003PDR-HM (451) • APKT 1003..R (453) • APKT 1003..TR-RM (452) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • APKT 1003PDTR/L-RM (452) • APKT 1003R8T-FF (454) • APKW 100304 PDR (PCD) (450) • HM90 APCR 100304PDFR-P/DP (449) • HM90 APCT 1003 (448) • HM90 APKT 1003 (449) • HM90 APKT 1003PD-W (453) • HM90 APKW 1003PDR (453)

For holders, see pages: MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

MULTI-MASTER

HM90 E90A-MM-10-JHP

90° JHP Endmills with a MULTI-MASTER Threaded Adaptation Carrying HELI2000 and HELIMILL Inserts



Designation	DC	CICT(1)	APMX	OAL	RMPX°(2)	LF	THSZMS	TQ_3(3)	DRVS(4)	DCONMS	MIID(5)	kg
HM90 E90A D16-2-MMT10-JHP	16.00	2	10.00	34.80	15.0	23.40	T10	28	13.0	15.60	APKT 1003PDR-HM	0.10
HM90 E90A D20-3-MMT12-JHP	20.00	3	10.00	38.50	7.5	25.50	T12	28	16.0	19.70	APKT 1003PDR-HM	0.15
HM90 E90A D25-4-MMT15-JHP	25.00	4	10.00	47.00	7.5	30.00	T15	40	20.0	24.70	APKT 1003PDR-HM	0.05

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation see page 44 • For user guide see pages 542-548

(1) Number of inserts

(2) Maximum ramping angle

(3) Tool tightening torque Nxm (lbfxin)

(4) Torque key size

(5) Master insert identification

For inserts, see pages: APCR 1003PDFR-P (450) • APCT 1003PDR-HM (450) • APKR 1003PDR-HM (451) • APKT 1003..R (453) • APKT 1003..TR-RM (452) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • APKT 1003PDTR/L-RM (452) • APKT 1003R8T-FF (454) • APKW 100304 PDR (PCD) (450) • HM90 APCR 100304PDFR-P/DP (449) • HM90 APCT 1003 (448) • HM90 APKT 1003 (449) • HM90 APKT 1003PD-W (453) • HM90 APKW 1003PDR (453)

For holders, see pages: MM CAB (667) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

Spare Parts

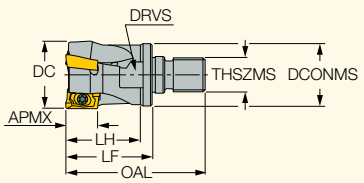
Designation			
HM90 E90A-MM-10-JHP	SR 34-505/HG(a)	BLD T08/M7	SW4-SD

(a) Recommended tightening torque for this item: 1.2 Nxm

FLEXFIT HELI2000

HM90 E90A-M-10

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM90 AP.. 1003... Inserts



Designation	DC	CICT(1)	DCONMS	THSZMS	LH	LF	OAL	APMX	RMPX°(2)	CSP(3)	DRVS(4)	TQ_3(5)	kg
HM90 E90A-D16-2-M08	16.00	2	14.75	M08	24.0	30.00	47.50	10.00	15.0	0	20	10.0	0.03
HM90 E90A-D20-3-M10	20.00	3	18.00	M10	30.0	30.00	50.00	10.00	7.5	1	15.0	29	0.05
HM90 E90A-D20-3-M12	20.00	3	21.00	M12	24.0	30.00	52.00	10.00	7.5	1	33	19.0	0.06
HM90 E90A-D25-3-M12	25.00	3	21.00	M12	35.0	35.00	57.00	10.00	2.5	1	19.0	33	0.08
HM90 E90A-D25-4-M12	25.00	4	21.00	M12	35.0	35.00	57.00	10.00	2.5	1	19.0	33	0.08
HM90 E90A-D32-4-M16	32.00	4	29.00	M16	35.0	35.00	60.00	10.00	3.0	1	25.0	40	0.16

• For adaptation see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Maximum ramping angle

(3) 0 - Without coolant supply, 1 - With coolant supply

(4) Torque key size

(5) Tool tightening torque Nxm (lbfxin)

For inserts, see pages: APCR 1003PDFR-P (450) • APCT 1003PDR-HM (450) • APKR 1003PDR-HM (451) • APKT 1003..R (453) • APKT 1003..TR-RM (452) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • APKT 1003PDTR/L-RM (452) • APKT 1003R8T-FF (454) • APKW 100304 PDR (PCD) (450) • HM90 APCR 100304PDFR-P/DP (449) • HM90 APCT 1003 (448) • HM90 APKT 1003 (449) • HM90 APKT 1003PD-W (453) • HM90 APKW 1003PDR (453)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

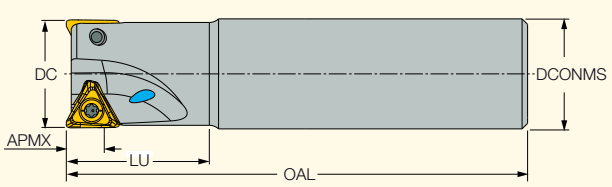
Spare Parts

Designation				
HM90 E90A-D16-2-M08	SR 34-505/HG	T-8/53		
HM90 E90A-D20-3-M10	SR 34-505/HG	T-8/53		
HM90 E90A-D20-3-M12	SR 34-505/HG	T-8/53		
HM90 E90A-D25-3-M12	SR 34-505/HG	T-8/53		
HM90 E90A-D25-4-M12	SR 34-505/HG		SW4-SD	BLD T08/M7
HM90 E90A-D32-4-M16	SR 34-505/HG	T-8/53		

HELIDO 690 LINE

H690 E90AX-10

90° Endmills Carrying H690 TNKX 1005..Triangular Inserts with 6 Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LU	DCONMS	Shank(2)	RMPX°(3)	kg			
H690 E90AX D20-2-C20-10	20.00	2	8.00	110.00	26.0	20.00	C	2.8	0.23	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D20-2-W20-10	20.00	2	8.00	90.00	26.0	20.00	W	2.8	0.18	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D20-3-C20-10	20.00	3	8.00	110.00	26.0	20.00	C	2.8	0.23	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D20-3-W20-10	20.00	3	8.00	90.00	26.0	20.00	W	2.8	0.18	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D25-3-C25-10	25.00	3	8.00	120.00	26.0	25.00	C	2.6	0.39	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D25-3-W25-10	25.00	3	8.00	95.00	26.0	25.00	W	2.6	0.29	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D25-4-C25-10	25.00	4	8.00	120.00	26.0	25.00	C	2.6	0.39	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D25-4-W25-10	25.00	4	8.00	95.00	26.0	25.00	W	2.6	0.30	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D32-4-C32-10	32.00	4	8.00	130.00	30.0	32.00	C	1.6	0.72	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D32-4-W32-10	32.00	4	8.00	110.00	30.0	32.00	W	1.6	0.60	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D32-5-C32-10	32.00	5	8.00	130.00	30.0	32.00	C	1.6	0.71	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D32-5-W32-10	32.00	5	8.00	110.00	30.0	32.00	W	1.6	0.59	SR 10508082-HG	BLD T08/M7	SW4-SD
H690 E90AX D40-5-W32-10	40.00	5	8.00	110.00	38.0	32.00	W	1.1	0.63	SR 10508082-HG	BLD T08/M7	SW4-SD

• For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

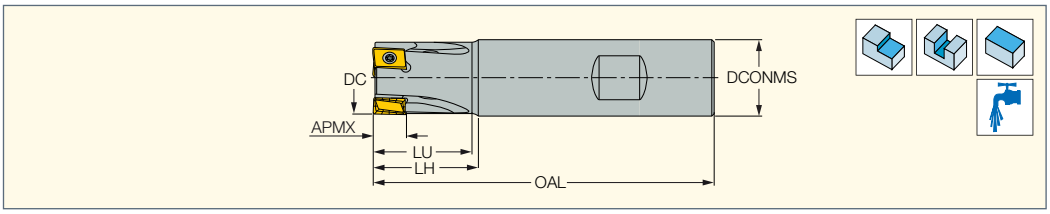
(3) Maximum ramping angle

For inserts, see pages: H690 TNKX/TNCX 1005 (472)

HELITANG T490 LINE

T490 ELN-11

90° Endmills Carrying
T490 LN#T 11...
Tangentially Clamped Inserts



Designation	DC	CICT[4]	LH	LU	APMX	OAL	DCONMS	Shank[5]	RMPX°[6]	kg			
T490 ELN D22-2-W25-11 [1]	22.00	2	35.0	33.0	9.00	95.00	25.00	W	-	0.29	SR 34-535-SN/L9.3	BLD T15/S7[a]	SW6-SD
T490 ELN D25-3-C24-11B [2]	25.00	3	35.0	33.0	9.00	200.00	24.00	C	1.7	0.64	SR 34-535/L9.5-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D25-3-C25-11 [3]	25.00	3	35.0	33.0	9.00	120.00	25.00	C	1.7	0.40	SR 34-535/L9.5-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D25-3-W25-11 [3]	25.00	3	35.0	33.0	9.00	95.00	25.00	W	1.7	0.30	SR 34-535/L9.5-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D32-3-C32-11	32.00	3	40.0	38.0	9.00	130.00	32.00	C	1.5	0.73	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D32-3-C32-11B [2]	32.00	3	40.0	38.0	9.00	200.00	32.00	C	1.5	1.16	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D32-3-W32-11	32.00	3	40.0	38.0	9.00	110.00	32.00	W	1.5	0.60	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D32-4-C32-11	32.00	4	40.0	38.0	9.00	130.00	32.00	C	1.5	0.73	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D32-4-W32-11	32.00	4	40.0	38.0	9.00	110.00	32.00	W	1.5	0.60	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D40-4-C32-11	40.00	4	44.0	38.0	9.00	130.00	32.00	C	1.4	0.84	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D40-4-W32-11	40.00	4	44.0	38.0	9.00	115.00	32.00	W	1.4	0.75	SR 34-535-SN	BLD T15/S7[a]	SW6-SD
T490 ELN D40-5-C32-11	40.00	5	44.0	38.0	9.00	130.00	32.00	C	1.4	0.83	SR 34-535-SN	BLD T15/S7[a]	SW6-SD

- Important: Maximum clamping torque 3.2 N*m

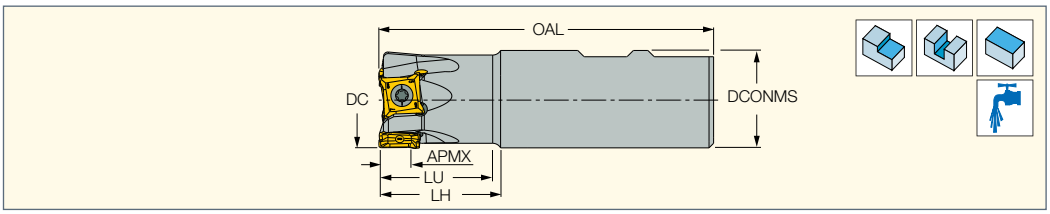
[1] Recommended cutting conditions: at a_p=6 mm, f_z=0.12 mm/t at a_p=8 mm, f_z=0.10 mm/t
[2] Long cylindrical shank
[3] Recommended cutting conditions: at a_p=6 mm, f_z=0.15 mm/t at a_p=8 mm, f_z=0.12 mm/t
[4] Number of inserts
[5] C-Cylindrical, W-Weldon
[6] Maximum ramping angle - valid only with T490 LNHT 1106PNTR-RD insert
[a] Recommended key handle for limiting torque to 3.2 N*m for this item is HSD 4-3.2NM (to be used with BLD 4 T15-4.8 blade)

For inserts, see pages: T490 LNMT/LNHT 1106 (477)

LOGIQ8TANG T890 MILLING LINE

T890HT ELN-R13

90° Endmills Carrying
T890 LN.T 1306...
Tangentially Clamped Inserts
with 8 Cutting Edges



Designation	DC	APMX	CICT[1]	DCONMS	Shank[2]	LU	LH	OAL	kg
T890HT ELN D32-3-C32-13	32.00	9.50	3	32.00	C	37.40	40.0	130.00	0.68
T890HT ELN D32-3-C32-13B	32.00	9.50	3	32.00	C	47.40	50.0	250.00	1.43
T890HT ELN D32-3-W32-13	32.00	9.50	3	32.00	W	37.40	40.0	110.00	0.56
T890HT ELN D40-4-C32-13	40.00	9.50	4	32.00	C	-	44.0	130.00	0.12
T890HT ELN D40-4-W32-13	40.00	9.50	4	32.00	W	-	40.0	115.00	0.69

[1] Number of inserts
[2] C-Cylindrical, W-Weldon

For inserts, see pages: T890 LN.. 1306 (475)

Spare Parts

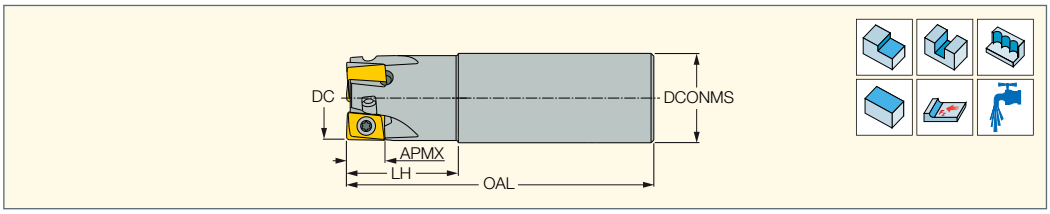
Designation			
T890HT ELN-R13	SR 10513105[a]	BLD IP20/M7	SW6-T-SH

[a] Recommended tightening torque: 8.0 N*m (71.0 lbf*in)

HELIDO 490 LINE

H490 E90AX-12

90° Endmills Carrying H490 ANKX 12...Double-Sided Rectangular Inserts with 4 Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg			
H490 E90AX D25-2-C25-12	25.00	2	12.00	110.00	35.0	25.00	C	1.5	0.36	SR 14-544/S	SW6-T	BLD T15/M7
H490 E90AX D25-2-W25-12	25.00	2	12.00	110.00	35.0	25.00	W	1.5	0.35	SR 14-544/S	SW6-T	BLD T15/M7
H490 E90AX D32-3-C32-12	32.00	3	12.00	110.00	40.0	32.00	C	4.0	0.60	SR 14-544	SW6-T	BLD T15/M7
H490 E90AX D32-3-W32-12	32.00	3	12.00	110.00	40.0	32.00	W	4.0	0.59	SR 14-544	SW6-T	BLD T15/M7
H490 E90AX D40-4-C32-12	40.00	4	12.00	130.00	40.0	32.00	C	1.5	0.83	SR 14-544	SW6-T	BLD T15/M7
H490 E90AX D40-4-W32-12	40.00	4	12.00	115.00	40.0	32.00	W	1.5	0.73	SR 14-544	SW6-T	BLD T15/M7

- For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

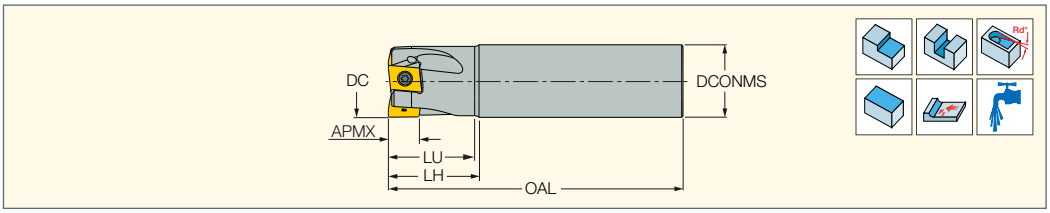
(3) Maximum ramping angle - valid only when the H490 ANKX1205R 15T-FF insert is used

For inserts, see pages: H490 ANKX/ANCX 1205-FF (471) • H490 ANKX/ANCX-12 (470)

HELITANG T490 LINE

T490 ELN-13

90° Endmills Carrying Tangentially Clamped Inserts with 4 Helical, 12.5 mm Long Cutting Edges



Designation	DC	CICT(2)	OAL	LH	LU	APMX	DCONMS	Shank(3)	RMPX°(4)	kg			
T490 ELN D25-2-C25-13	25.00	2	120.00	35.0	33.0	12.50	25.00	C	-	0.39	SR M4.5-10507218	BLD T15/S7	SW6-T-SH
T490 ELN D25-2-W25-13	25.00	2	95.00	35.0	33.0	12.50	25.00	W	-	0.29	SR M4.5-10507218	BLD T15/S7	SW6-T-SH
T490 ELN D32-3-C32-13	32.00	3	130.00	40.0	38.0	12.50	32.00	C	2.8	0.72	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D32-3-C32-13B (1)	32.00	3	250.00	50.0	48.0	12.50	32.00	C	2.8	1.44	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D32-3-W32-13	32.00	3	110.00	40.0	38.0	12.50	32.00	W	2.8	0.59	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D40-3-C40-13B (1)	40.00	3	250.00	50.0	48.0	12.50	40.00	C	2.0	2.25	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D40-4-C32-13	40.00	4	130.00	40.0	-	12.50	32.00	C	2.0	0.81	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D40-4-W32-13	40.00	4	115.00	40.0	-	12.50	32.00	W	2.0	0.72	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D50-4-C32-13	50.00	4	130.00	36.5	-	12.50	32.00	C	1.5	0.96	SR 34-535-SN	BLD T15/S7	SW6-T-SH
T490 ELN D50-5-C32-13	50.00	5	130.00	36.5	-	12.50	32.00	C	1.5	0.96	SR 34-535-SN	BLD T15/S7	SW6-T-SH

- For user guide see pages 542-548

(1) "B" suffix for long cylindrical shank which may be shortened.

(2) Number of inserts

(3) C-Cylindrical, W-Weldon

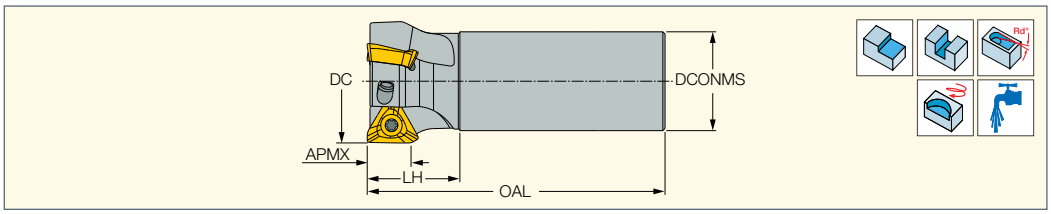
(4) Maximum ramping angle - valid only when T490 LNHT 1306 PNTR-RD insert is used

For inserts, see pages: T490 LNAR-P (480) • T490 LNMT 1306PNR-FF (479) • T490 LNMT 1306PNTR-FW (479) • T490 LNMT/LNHT/LNAR 1306 (478)

HELI3MILL HM390 LINE

HM390 ETD-15

90° Endmills Carrying HM390 TDKT 1505 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LH	DCONMS	RMPX°(2)	kg			
HM390 ETD D040-3-C32-15	40.00	13.00	3	130.00	40.0	32.00	2.1	0.71	SR 10511869	BLD IP20/S7	SW6-T
HM390 ETD D040-4-C32-15	40.00	13.00	4	130.00	30.0	32.00	2.1	0.73	SR 10511869	BLD IP20/S7	SW6-T
HM390 ETD D050-4-C32-15	50.00	13.00	4	130.00	40.0	32.00	1.6	0.84	SR 10505427	BLD IP20/S7	SW6-T

- When assembled the HM390 TDKT 1505PDR-FW insert, tool diameter enlarges by 1.0 mm • For user guide, see pages 542-548

(1) Number of inserts

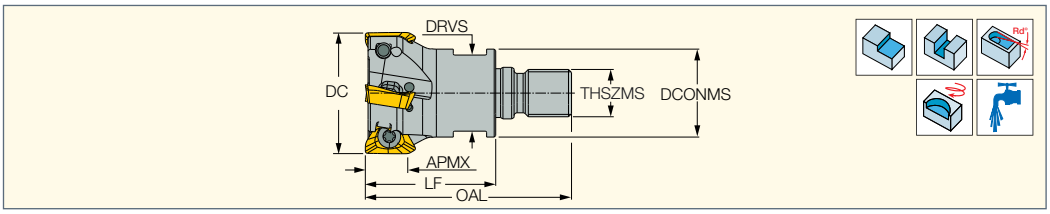
(2) Maximum ramping angle

For inserts, see pages: HM390 TDCR 1505 (448) • HM390 TDKT/CT 1505 (447)

HELI3MILL HM390 LINE
FLEXFIT

HM390 ETD-M

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM390 TDKT 1505 Triangular Inserts



Designation	DC	APMX	CICT(1)	LF	DCONMS	THSZMS	OAL	DRVS(2)	RMPX°(3)	TQ_3(4)	kg			
HM390 ETD D040-4-M16	40.00	13.00	4	43.00	29.00	M16	68.00	25.0	2.1	40	0.22	SR 10511869	BLD IP20/S7	SW6-T

• For adaptation, see page 44 • For user guide see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

• When assembled the HM390 TDKT 1505PDR-FW insert, tool diameter enlarges by 1.0 mm

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

(4) Tool tightening torque Nxm (lbfxin)

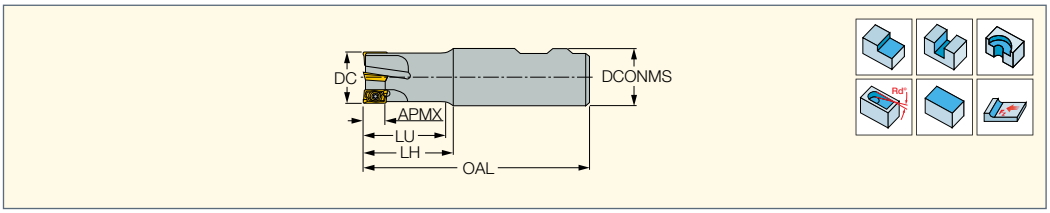
For inserts, see pages: HM390 TDCR 1505 (448) • HM390 TDKT/CT 1505 (447)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

HELI2000

HM90 E90AD-15

90° Endmills Carrying HM90 ADKT-1505... Inserts



Designation	DC	CICT(1)	APMX	OAL	LH	LU	RMPX°(2)	DCONMS	Shank(3)	CSP(4)	kg			
HM90 E90AD-D20-1-C20	20.00	1	14.30	110.00	35.0	34.0	3.0	20.00	C	0	0.24	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C24-B	25.00	2	14.30	200.00	30.0	-	11.5	24.00	C	0	0.67	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25	25.00	2	14.30	110.00	35.0	34.0	11.5	25.00	C	0	0.37	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-B	25.00	2	14.30	200.00	50.0	49.0	11.5	25.00	C	0	0.71	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-C	25.00	2	14.30	110.00	35.0	34.0	11.5	25.00	C	1	0.34	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-XL	25.00	2	14.30	150.00	35.0	34.0	11.5	25.00	C	0	0.53	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25	25.00	2	14.30	100.00	35.0	34.0	11.5	25.00	W	0	0.33	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25-C	25.00	2	14.30	100.00	35.0	34.0	11.5	25.00	W	1	0.30	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25-XL	25.00	2	14.30	150.00	70.0	69.0	11.5	25.00	W	0	0.51	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-2-C32	32.00	2	14.30	120.00	40.0	38.0	5.3	32.00	C	0	0.68	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C31-B	32.00	3	14.30	250.00	30.0	-	5.3	31.00	C	0	1.41	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32	32.00	3	14.30	120.00	40.0	38.0	5.3	32.00	C	0	0.67	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32-B	32.00	3	14.30	250.00	50.0	48.0	5.3	32.00	C	0	1.48	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-C32-C	32.00	3	14.30	120.00	40.0	38.0	5.3	32.00	C	1	0.63	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32-XL	32.00	3	14.30	160.00	40.0	38.0	5.3	32.00	C	0	0.92	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-W32	32.00	3	14.30	110.00	40.0	38.3	5.3	32.00	W	0	0.59	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-W32-C	32.00	3	14.30	110.00	40.0	38.3	5.3	32.00	W	1	0.56	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-W32-XL	32.00	3	14.30	160.00	40.0	38.3	5.3	32.00	W	0	0.91	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-3-C40-B	40.00	3	14.30	250.00	50.0	48.0	4.0	40.00	C	0	2.34	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-3-W40-XL	40.00	3	14.30	200.00	80.0	78.0	4.0	40.00	W	0	1.81	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-C32	40.00	4	14.30	130.00	40.0	-	4.0	32.00	C	0	0.82	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-W32	40.00	4	14.30	115.00	40.0	-	4.0	32.00	W	0	0.73	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-W32-C	40.00	4	14.30	115.00	40.0	-	4.0	32.00	W	1	0.69	SR 14-544/S	SW6-SD	BLD T15/M7

• For user guide see pages 542-548

(1) Number of inserts

(2) Maximum ramping angle

(3) C-Cylindrical, W-Weldon

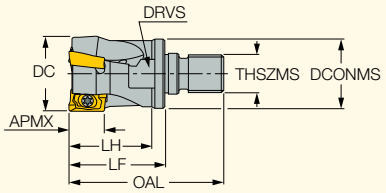
(4) 0 - Without coolant supply, 1 - With coolant supply

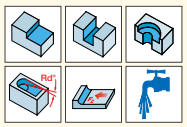
For inserts, see pages: ADCR 1505PDFR (456) • ADCT 1505PDFR-HM (457) • ADKR 1505PDR/L-HM (456) • ADKT 1505-FF (459) • ADKT 1505..R/L-HM (459) • ADKT 1505PD-W (460) • ADKT 1505PDR/L-HM (458) • ADKT 1505PDTR-76 (459) • ADKT 1505PDTR/L-RM (458) • ADKW (CBN) (457) • ADKW (PCD) (457) • ADMT 1505PDR-HS (458) • HM90 ADCR 1505PDFR-P (456) • HM90 ADCT 1505 (455) • HM90 ADCT 1505PDR-CF (455) • HM90 ADKT 1505 (454) • HM90 ADKT 1505PD-W (460) • HM90 ADKW 1505PDR (462)

HELI2000 FLEXFIT

HM90 E90AD-M-15

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM90 ADKT-1505... Inserts





Designation	DC	CICT(1)	APMX	DCONMS	THSZMS	LH	LF	OAL	RMPX°(2)	DRVS(3)	TQ_3(4)	kg			
HM90 E90AD-D25-2-M12	25.00	2	14.30	21.00	M12	30.8	35.00	57.00	11.5	19.0	33	0.08	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-M16	32.00	3	14.30	29.00	M16	40.0	40.00	65.00	5.3	25.0	40	0.16	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-M16	40.00	4	14.30	29.00	M16	40.0	40.00	65.00	4.0	25.0	40	0.21	SR 14-544/S	SW6-SD	BLD T15/M7

• For adaptation see page 44 • For user guide, see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Maximum ramping angle

(3) Torque key size

(4) Tool tightening torque Nxm (lbfxin)

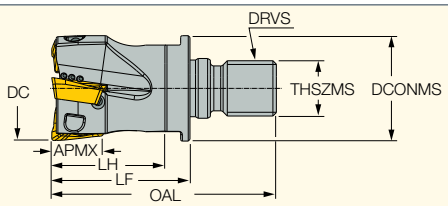
For inserts, see pages: ADCR 1505PDFR (456) • ADCT 1505PDFR-HM (457) • ADKR 1505PDR/L-HM (456) • ADKT 1505-FF (459) • ADKT 1505..R/L-HM (459) • ADKT 1505PD-W (460) • ADKT 1505PDR/L-HM (458) • ADKT 1505PDTR-76 (459) • ADKT 1505PDTR/L-RM (458) • ADKW (CBN) (457) • ADKW (PCD) (457) • ADMT 1505PDR-HS (458) • HM90 ADCR 1505PDFR-P (456) • HM90 ADCT 1505 (455) • HM90 ADCT 1505PDR-CF (455) • HM90 ADKT 1505 (454) • HM90 ADKT 1505PD-W (460) • HM90 ADKW 1505PDR (462)

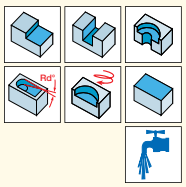
For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

FLEXFIT

HM90 E90AD-M-15-JHP

90° JHP Endmills With a FLEXFIT Threaded Adaptation Carrying HELI2000 and HELIMILL Inserts





Designation	DC	CICT(1)	APMX	OAL	RMPX°(2)	LF	THSZMS	DRVS(3)	DCONMS	TQ_3(4)	MIID(5)	MIID_2(6)	kg
HM90 E90AD D32-3-M16-JHP	32.00	3	14.30	65.00	5.3	40.00	M16	25.0	30.50	40	ADKT 1505PDTR	ADCT 1505R8T-FF	0.17

• For adaptation see page 44 • For user guide, see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Maximum ramping angle

(3) Torque key size

(4) Tool tightening torque Nxm (lbfxin)

(5) Master insert identification

(6) Master insert identification 2

For inserts, see pages: ADCR 1505PDFR (456) • ADCT 1505PDFR-HM (457) • ADKR 1505PDR/L-HM (456) • ADKT 1505-FF (459) • ADKT 1505..R/L-HM (459) • ADKT 1505PD-W (460) • ADKT 1505PDR/L-HM (458) • ADKT 1505PDTR-76 (459) • ADKT 1505PDTR/L-RM (458) • ADKW (CBN) (457) • ADKW (PCD) (457) • ADMT 1505PDR-HS (458) • HM90 ADCR 1505PDFR-P (456) • HM90 ADCT 1505 (455) • HM90 ADCT 1505PDR-CF (455) • HM90 ADKT 1505 (454) • HM90 ADKT 1505PD-W (460) • HM90 ADKW 1505PDR (462)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

Spare Parts

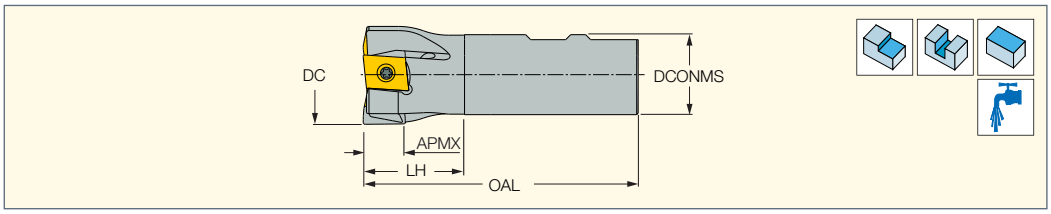
Designation			
HM90 E90AD-M-15-JHP	SR 14-544/S(a)	BLD T15/M7	SW6-T-SH

(a) Recommended tightening torque for this item: 4.8 Nxm

HELITANG T490 LINE

T490 ELN-16

90° Endmills Carrying Tangentially Clamped Inserts with 4 Helical, 16 mm Long Cutting Edges



Designation	DC	CICT(1)	APMX	LH	OAL	DCONMS	Shank(2)	kg			
T490 ELN D32-2-C32-16	32.00	2	16.00	41.0	130.00	32.00	C	0.70	SR 14-591-S	BLD T20/M7	SW6-T
T490 ELN D32-2-W32-16	32.00	2	16.00	41.0	130.00	32.00	W	0.70	SR 14-591-S	BLD T20/M7	SW6-T
T490 ELN D40-3-C32-16	40.00	3	16.00	40.0	130.00	32.00	C	0.76	SR 14-591	BLD T20/M7	SW6-T
T490 ELN D40-3-W32-16	40.00	3	16.00	40.0	110.00	32.00	W	0.64	SR 14-591	BLD T20/M7	SW6-T

• For user guide see pages 542-548

(1) Number of inserts

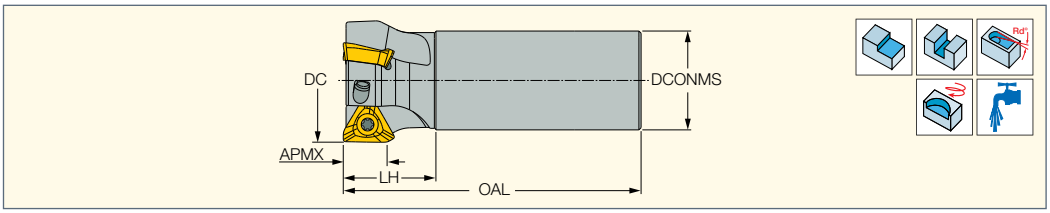
(2) C-Cylindrical, W-Weldon

For inserts, see pages: T490 LNAR-P (480) • T490 LNMT/LNHT 1607 (480)

HELI3MILL HM390 LINE

HM390 ETD-19

90° Endmills Carrying HM390 TDKT 1907 Triangular Inserts with 3 Helical Cutting Edges



Designation	DC	APMX	CICT(1)	OAL	LH	DCONMS	RMPX°(2)	Shank(3)	kg			
HM390 ETD D040-2-C32-19	40.00	16.00	2	130.00	45.0	32.00	2.0	C	0.69	SR 14-591/L12	BLD T20/S7	SW6-T

For user guide see pages 542-548

(1) Number of inserts

(2) Maximum ramping angle

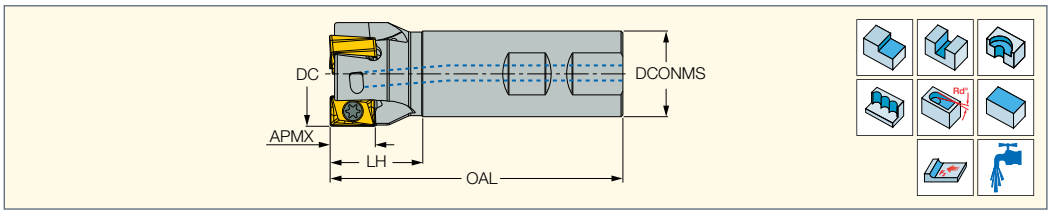
(3) C-Cylindrical

For inserts, see pages: HM390 TDKT 1907 (448)

HELIDO 490 LINE

H490 E90AX-17

90° Endmills Carrying H490 ANKX 17... Double-Sided Rectangular Inserts with 4 Helical Cutting Edges



Designation	DC	CICT(1)	APMX	OAL	LH	DCONMS	Shank(2)	RMPX°(3)	kg			
H490 E90AX D32-2-C32-17	32.00	2	16.30	130.00	44.0	32.00	C	6.5	0.70	SR 14-591	SW6-T	BLD T20/M7
H490 E90AX D32-2-W32-17	32.00	2	16.30	95.00	30.0	32.00	W	6.5	0.50	SR 14-591	SW6-T	BLD T20/M7
H490 E90AX D40-3-C32-17	40.00	3	16.30	130.00	44.0	32.00	C	4.4	0.76	SR 14-591	SW6-T	BLD T20/M7
H490 E90AX D40-3-W32-17	40.00	3	16.30	110.00	35.0	32.00	W	4.4	0.64	SR 14-591	SW6-T	BLD T20/M7
H490 E90AX D50-4-C32-17	50.00	4	16.30	120.00	40.0	32.00	C	3.8	0.81	SR 14-591	SW6-T	BLD T20/M7

• Rampdown angle is valid only when the H490 ANKX1706R15T-FF insert is used and tool diameter is 1.5 mm larger. • For user guide see pages 542-548

(1) Number of inserts

(2) C-Cylindrical, W-Weldon

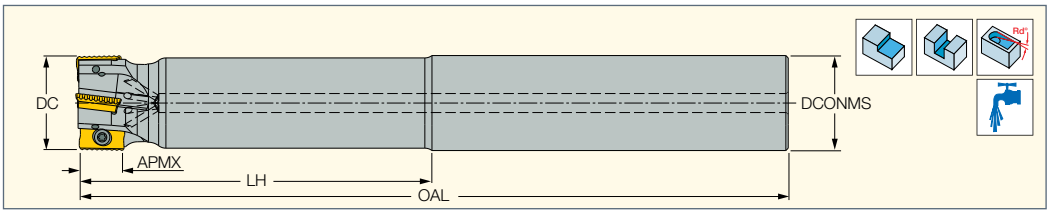
(3) Maximum ramping angle

For inserts, see pages: H490 ANKX 1706-FF (472) • H490 ANKX/ANCX-17 (472)

MILLSHRED P290 LINE

P290 EPW

Long Reach Endmills Carrying 12 and 18 mm Long Edged Inserts



Designation	DC	APMX	CICT[1]	LH	OAL	DCONMS	Shank[2]	RMPX°[3]	kg
P290 EPW D20-2-100-W20-12	20.00	12.00	2	40.0	100.00	20.00	W	2.0	0.20
P290 EPW D25-3-130-W25-12	25.00	12.00	3	70.0	130.00	25.00	W	1.4	0.39
P290 EPW D25-3-160-C25-12	25.00	12.00	3	90.0	160.00	25.00	C	1.4	0.47
P290 EPW D25-3-200-C25-12	25.00	12.00	3	120.0	200.00	25.00	C	1.4	0.62
P290 EPW D32-4-130-W25-12	32.00	12.00	4	-	130.00	25.00	W	1.0	0.46
P290 EPW D32-4-150-C25-12	32.00	12.00	4	-	150.00	25.00	C	1.0	0.54
P290 EPW D25-2-120-W25-18	25.00	18.00	2	60.0	120.00	25.00	W	2.5	0.36
P290 EPW D32-3-170-W32-18	32.00	18.00	3	100.0	170.00	32.00	W	2.0	0.84
P290 EPW D32-3-210-C32-18	32.00	18.00	3	130.0	210.00	32.00	C	2.0	1.06
P290 EPW D32-3-240-C32-18	32.00	18.00	3	160.0	240.00	32.00	C	2.0	1.22
P290 EPW D40-4-170-W32-18	40.00	18.00	4	-	170.00	32.00	W	1.5	0.95
P290 EPW D40-4-200-C32-18	40.00	18.00	4	-	200.00	32.00	C	1.5	1.13
P290 EPW D40-4-250-W40-18	40.00	18.00	4	150.0	250.00	40.00	W	1.5	2.08

• For user guide see pages 542-548

[1] Number of inserts

[2] C-Cylindrical, W-Weldon

[3] Maximum ramping angle

For inserts, see pages: P290 ACCT/KT (461) • P290 ACKT (461)

Spare Parts

Designation				
P290 EPW D20-2-100-W20-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D25-3-130-W25-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D25-3-160-C25-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D25-3-200-C25-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D32-4-130-W25-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D32-4-150-C25-12	SR M3X0.5-L7.4 IP9[a]	IP-9/151		
P290 EPW D25-2-120-W25-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D32-3-170-W32-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D32-3-210-C32-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D32-3-240-C32-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D40-4-170-W32-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D40-4-200-C32-18	SR 14-544/S[b]		BLD T15/M7	SW6-T
P290 EPW D40-4-250-W40-18	SR 14-544/S[b]		BLD T15/M7	SW6-T

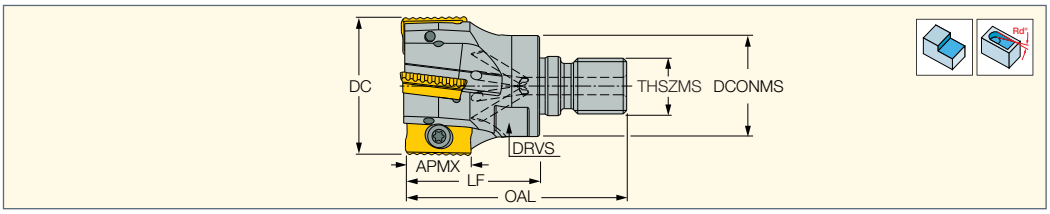
[a] Recommended tightening torque:2.0 N*m

[b] Recommended tightening torque:4.8 N*m

MILLSHRED P290 LINE
FLEXFIT

P290 EPW-M

Endmills with FLEXFIT Threaded Adaptation Carrying 12 and 18 mm Long Edged Inserts



Designation	DC	APMX	CICT(1)	LF	OAL	THSZMS	DCONMS	DRVS(2)	RMPX°(3)	CSP(4)	TQ_3(5)	kg
P290 EPW D20-2-M10-12	20.00	12.00	2	25.00	45.00	M10	18.00	15.0	2.0	0	29	0.04
P290 EPW D25-3-M12-12	25.00	12.00	3	30.00	52.00	M12	21.00	19.0	1.4	1	33	0.07
P290 EPW D32-4-M16-12	32.00	12.00	4	35.00	60.00	M16	29.00	25.0	1.0	1	40	0.16
P290 EPW D32-3-M16-18	32.00	18.00	3	40.00	65.00	M16	29.00	25.0	2.0	1	40	0.15
P290 EPW D40-4-M16-18	40.00	18.00	4	40.00	65.00	M16	29.00	25.0	1.5	1	40	0.20

• For adaptation see page 44 • For user guide, see pages 542-548 • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts

(2) Clamping wrench size

(3) Maximum ramping angle

(4) 0 - Without coolant supply, 1 - With coolant supply

(5) Tool tightening torque Nxm (lbfxin)

For inserts, see pages: P290 ACCT/KT (461) • P290 ACKT (461)

For holders, see pages: BT-ODP (FLEXFIT) (314) • C#-ODP (FLEXFIT) (314) • CAB M-M (FLEXFIT) (312) • DIN69871-ODP (315) • ER-ODP (315) • HSK A-ODP (FLEXFIT) (316) • S M (312) • S M-C-H (312) • S M-CF (313)

Spare Parts

Designation				
P290 EPW D20-2-M10-12	SR M3X0.5-L7.4 IP9(b)	IP-9/151		
P290 EPW D25-3-M12-12	SR M3X0.5-L7.4 IP9(b)	IP-9/151		
P290 EPW D32-4-M16-12	SR M3X0.5-L7.4 IP9(b)	IP-9/151		
P290 EPW D32-3-M16-18	SR 14-544/S(a)		BLD T15/M7	SW6-T
P290 EPW D40-4-M16-18	SR 14-544/S(a)		BLD T15/M7	SW6-T

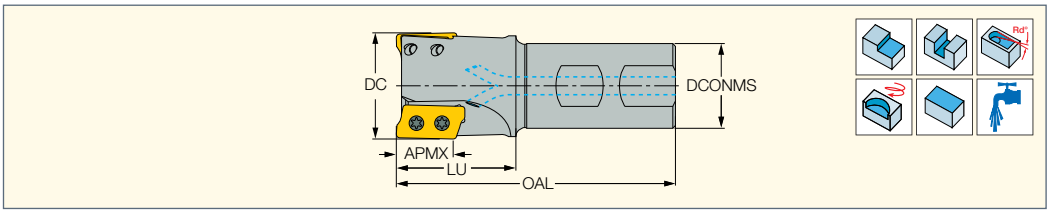
(a) Recommended tightening torque:2.0 N*m

(b) Recommended tightening torque:4.8 Nxm

HELIPLUS

HP E90AT-19

90° Endmills Carrying HP AD.. 1906.. Inserts



Designation	DC	CICT(1)	APMX	OAL	LU	RMPX°(2)	DCONMS	Shank(3)	kg			
HP E90AT-D25-2-W25-19	25.00	2	18.00	100.00	40.0	14.0	25.00	W	0.30	SR 14-571/L	SW6-SD	BLD T10/S7
HP E90AT-D32-3-W32-19	32.00	3	18.00	105.00	40.0	7.0	32.00	W	0.52	SR 14-571/L	SW6-SD	BLD T10/S7

• First loosely attach the inner clamping screw, then the outer one. In the same order tighten them both. • For user guide see pages 542-548

(1) Number of inserts

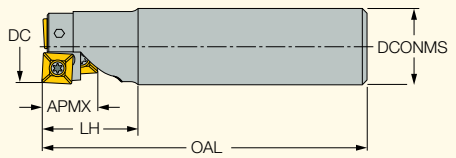
(2) Maximum ramping angle

(3) W-Weldon

For inserts, see pages: HP ADCR 1906 (464) • HP ADKT/ADCT 1906 (464)

HELIQUAD

E90XC
Drilling Endmills Carrying Square S/XOMT Inserts

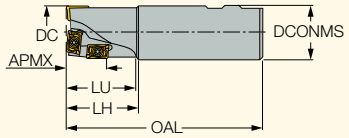


Designation	DC	CICT(1)	NOF(2)	APMX	LH	OAL	DCONMS	Shank(3)	CSP(4)	kg		
E90XC D12-06-C12-06	12.00	1	1	5.80	25.0	90.00	12.00	C	0	0.07	SR 34-508	T-7/51
E90XC D20-22-C20-06	20.00	5	1	22.00	37.0	120.00	20.00	C	1	0.24	SR 34-508/L	T-7/51

• Use the XOMT 06.... insert in central face location • For user guide see pages 542-548
(1) Number of inserts
(2) Number of flutes
(3) C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply
For inserts, see pages: SOMT-HQ (494) • XOMT-HQ (494)

HELIMILL

E90AC
Drilling Endmills Carrying APKT/ADKT Inserts



Designation	DC	CICT(1)	NOF(2)	APMX	LU	LH	OAL	DCONMS	Shank(3)	MIID(4)	kg
E90AC D25-20W25	25.00	3	2	19.00	49.0	50.0	110.00	25.00	W	APKT 1003PDR-HM	0.30
E90AC D32-25W32	32.00	3	2	25.00	48.0	50.0	130.00	32.00	W	ADCT 1505PDFR-HM	0.60
E90AC D38-25W32	38.00	5	2	26.00	-	50.0	130.00	32.00	W	ADCT 1505PDFR-HM	0.70

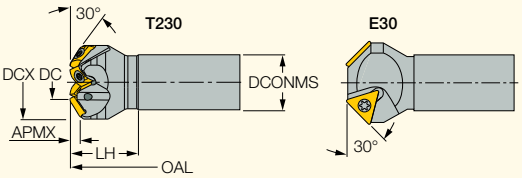
• For user guide see pages 542-548
(1) Number of inserts
(2) Number of flutes
(3) W-Weldon
(4) Master insert identification
For inserts, see pages: ADCT 1505PDFR-HM (457) • ADKT 1505..R/L-HM (459) • ADKT 1505PDR/L-HM (458) • ADKT 1505PDTR-76 (459) • APKT 1003PDR-HM (451) • APKT 1003PDR-HM-CS (451) • APKT 1003PDTR-76 (452) • XPMT-HQ (496)

Spare Parts

Designation				
E90AC D25-20W25	SR 34-505/HG	BLD T08/M7	SW4-SD	
E90AC D32-25W32	SR 14-544/S	BLD T15/M7	SW6-T	
E90AC D38-25W32	SR 14-544/S	BLD T15/M7	SW6-T	ZPN 4-520

ISCARMILL

E30 / T230
30° Chamfering Endmills



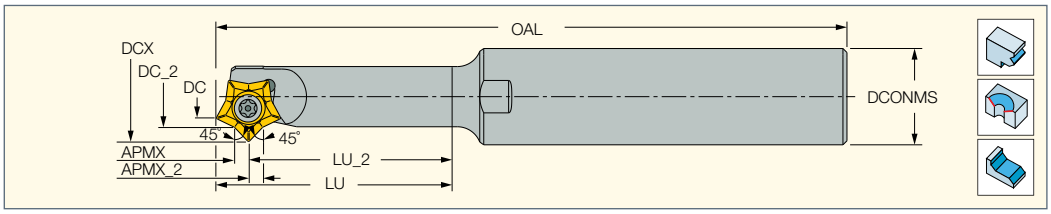
Designation	DC	DCX(1)	CICT(2)	APMX	OAL	LH	DCONMS	Shank(3)	CSP(4)	MIID(5)	kg		
T230 ELN D12-4-C16-05	12.00	21.50	4	2.50	90.00	20.0	16.00	C	1	T290 LNHT 0502	0.13	SR 10503833	T-7/51
T230 ELN D12-4-W16-05	12.00	21.50	4	2.50	90.00	20.0	16.00	W	1	T290 LNHT 0502	0.13	SR 10503833	T-7/51
E30 D16-W25	16.00	40.90	3	7.00	100.00	36.4	25.00	W	0	TPMT 1603	0.42	SR 14-541	T-15/51

• For user guide see pages 542-548
(1) Cutting diameter maximum
(2) Number of inserts
(3) C - Cylindrical, W - Weldon
(4) 0 - Without coolant supply, 1 - With coolant supply
(5) Master insert identification
For inserts, see pages: T290 LNMT/LNHT 0502 (474) • TPMT (468)

CHAMFMILL
CHAMFERING LINE

CH45-PN06

Upper and Bottom Chamfering Endmills Carrying Pentagonal Inserts



Designation	DCX[1]	DC_2	DC	APMX	APMX_2	DCONMS	CICT[2]	LU	LU_2	OAL	DMIN[3]	kg
CH45-10-30-1-C12-PN06	11.70	8.45	6.60	1.50	1.50	12.00	1	29.40	25.40	100.00	10.00	0.00
CH45-17-60-2-C16-PN06	16.70	13.45	11.40	1.50	1.50	16.00	2	29.40	25.40	110.00	17.00	0.13
CH45-19-80-3-C16-PN06	18.70	15.45	13.40	1.50	1.50	16.00	3	29.40	25.40	130.00	19.00	0.16

[1] Cutting diameter maximum
[2] Number of inserts
[3] Minimum penetration diameter for back chamfering
For inserts, see pages: PNMT 0602-TN (540)

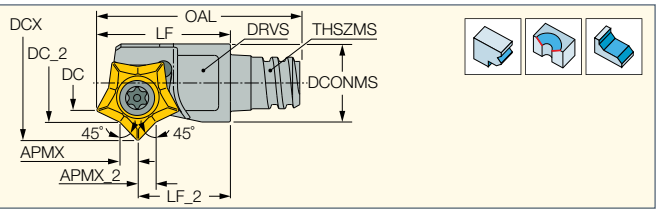
Spare Parts

Designation		
CH45-PN06	SR M2.5X5-T7-60	T-7/51

CHAMFMILL
CHAMFERING LINE
MULTI-MASTER

CH45-MM-PN06

Upper and Bottom Chamfering Endmills with MULTI-MASTER Threaded Adaptation



Designation	DCX[1]	DC_2	DC	APMX	APMX_2	LF	LF_2	OAL	DCONMS	THSZMS	CICT[2]	DRVS[3]	DMIN[4]	kg
CH45-10/.39-1-MMT05-PN06	11.70	8.45	6.60	1.50	1.50	13.00	9.00	19.75	7.60	T05	1	5.5	10.00	0.00
CH45-17/.67-2-MMT08-PN06	16.70	13.45	11.40	1.50	1.50	18.00	14.00	25.50	12.20	T08	2	10.0	17.00	0.02
CH45-19/.75-3-MMT10-PN06	18.70	15.45	13.40	1.50	1.50	20.00	16.00	31.30	15.30	T10	3	13.0	19.00	0.02

• Do not apply lubricant to the MULTI-MASTER threaded connection • For adaptation options, see page 44 • For user guide see pages 542-548
[1] Cutting diameter maximum
[2] Number of inserts
[3] Width across flats (wrench should be ordered separately)
[4] Minimum penetration diameter for back chamfering
For inserts, see pages: PNMT 0602-TN (540)
For holders, see pages: MM CAB (667) • MM CAB-T-T (91) • MM GRT (shanks) (86) • MM S-A (stepped shanks) (84) • MM S-A (straight shanks) (87) • MM S-A-C# (86) • MM S-A-HSK (609) • MM S-A-N (85) • MM S-A-SK (90) • MM S-B (85° conical shanks) (87) • MM S-D (89° conical shanks) (88) • MM S-ER (89) • MM S-ER-H (89) • MM TS-A (86)

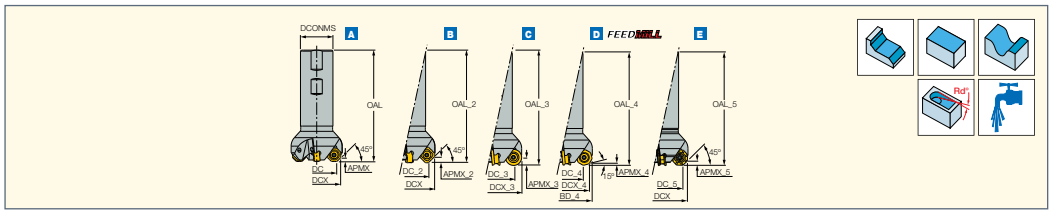
Spare Parts

Designation		
CH45-MM-PN06	SR M2.5X5-T7-60	T-7/51

HELIDO 800 LINE

SOE45 8/16

Multifunctional Endmills for Octagonal, Square and Round Insert Contours with Various Entry Angles



Designation	DC	DC_2	DC_3	DC_4	DC_5	DCX[1]	DCX_3	DCX_4	BD_4	APMX	APMX_2	APMX_3	APMX_4
SOE45 8/16-D025-02-W20R	25.00	22.65	20.90	20.10	25.30	35.40	36.50	29.40	35.60	3.50	6.00	7.90	1.20
SOE45 8/16-D032-03-W25R	32.00	29.65	27.50	26.70	32.30	42.40	43.30	36.20	42.60	3.50	6.00	7.90	1.20
SOE45 8/16-D040-04-W32R	40.00	37.65	35.40	37.50	40.30	50.40	51.30	47.00	50.60	3.50	6.00	7.90	1.20

Designation	APMX_5	DCONMS	CICT[2]	OAL	OAL_2	OAL_3	OAL_4	OAL_5	RMPX°[3]	kg
SOE45 8/16-D025-02-W20R	2.90	20.00	2	100.00	101.2	101.60	101.30	101.20	3.1	0.25
SOE45 8/16-D032-03-W25R	2.90	25.00	3	100.00	101.2	101.60	101.30	101.20	4.2	0.38
SOE45 8/16-D040-04-W32R	2.90	32.00	4	110.00	111.2	111.60	111.30	111.20	3.7	0.72

• A- with ONMU 0505... insert • B- with S845 SNMU 1305... insert • C- with RXMT 1607N insert • D- with OXMT 0507R08-FF insert
• E- with OXMT 050705-R-HP insert • Use only Torx Plus keys • For user guide see pages 542-548

(1) Cutting diameter maximum
(2) Number of inserts
(3) Maximum ramping angle - valid only with RXMT 1607N insert

For inserts, see pages: ONHU 0505-W (487) • ONHU/ONMU-05 (487) • OXMT 0507 (488) • RXMT 1607 (505) • S845 SNHU 1305-W (484) • S845 SNMU/SNHU-13 (483)

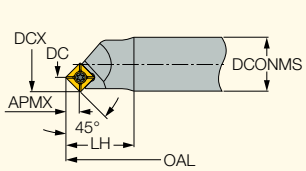
Spare Parts

Designation			
SOE45 8/16	SR 11800745	BLD IP15/S7	SW6-T-SH

HELIQUAD

E45X

45° Chamfering Endmills Carrying X/Q/SOMT 06 Inserts



Designation	DC	DCX[1]	CICT[2]	APMX	LH	OAL	DCONMS	Shank[3]	kg		
E45X D06-C12-06	6.00	14.10	1	4.00	25.0	80.00	12.00	C	0.06	SR 34-508	T-7/51
E45X D06-W12-06	6.00	14.10	1	4.00	19.0	70.00	12.00	W	0.05	SR 34-508	T-7/51
E45X D08-C16-06	8.00	16.10	1	4.00	25.0	100.00	16.00	C	0.14	SR 34-508	T-7/51
E45X D08-W16-06	8.00	16.10	1	4.00	23.0	80.00	16.00	W	0.11	SR 34-508	T-7/51

• For user guide see pages 542-548

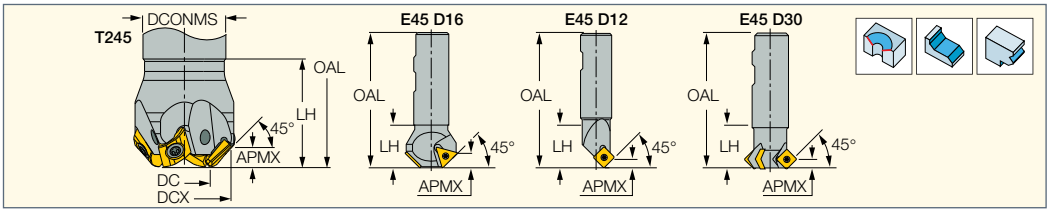
(1) Cutting diameter maximum
(2) Number of inserts
(3) C-Cylindrical, W-Weldon

For inserts, see pages: QOMT-HQ (494) • SOMT-HQ (494) • XOMT-HQ (494)

ISCARMILL

E45 / T245

45° Chamfering Endmills



Designation	DC	DCX[1]	CICT[2]	APMX	OAL	LH	DCONMS	Shank[3]	CSP[4]	MIID[5]	kg		
T245 ELN D12-4-C16-05	12.00	19.70	4	3.60	90.00	20.0	16.00	C	1	T290 LNHT 0502	0.12	SR 10503833	T-7/51
T245 ELN D12-4-W16-05	12.00	19.70	4	3.60	90.00	20.0	16.00	W	1	T290 LNHT 0502	0.12	SR 10503833	T-7/51
E45 D16-W25	16.00	35.90	2	9.70	100.00	33.0	25.00	W	0	TPMT 1603	0.35	SR 14-541	T-15/51
E45 D30-W25	30.00	46.10	3	7.80	100.00	35.0	25.00	W	0	SCMT 120408-19	0.37	SR 16-212	T-20/51
E45 D30-W32	30.00	46.10	3	7.80	110.00	35.0	32.00	W	0	SCMT 120408-19	0.61	SR 16-212	T-20/51

• For user guide see pages 542-548

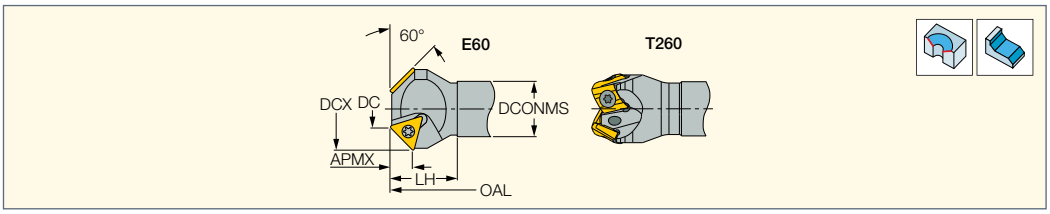
(1) Cutting diameter maximum
(2) Number of inserts
(3) W-Weldon C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply
(5) Master insert identification

For inserts, see pages: SCMT-19 (514) • SDMT-AD-N (513) • T290 LNMT/LNHT 0502 (474) • TPMT (468)

ISCARMILL

E60 / T260

60° Chamfering Endmills



Designation	DC	DCX(1)	CICT(2)	APMX	OAL	LH	DCONMS	Shank(3)	CSP(4)	MIID(5)	kg		
T260 ELN D12-4-C12-05	12.00	17.50	4	4.50	80.00	20.0	12.00	C	1	T290 LNHT 0502	0.06	SR 10503833	T-7/51
T260 ELN D12-4-W12-05	12.00	17.50	4	4.50	80.00	20.0	12.00	W	1	T290 LNHT 0502	0.06	SR 10503833	T-7/51
E60 D25-W25	25.00	39.40	2	12.30	100.00	33.0	25.00	W	0	TPMT 1603	0.39	SR 14-541	T-15/51

- For user guide see pages 542-548

(1) Cutting diameter maximum

(2) Number of inserts

(3) W-Weldon C-Cylindrical

(4) 0 - Without coolant supply, 1 - With coolant supply

(5) Master insert identification

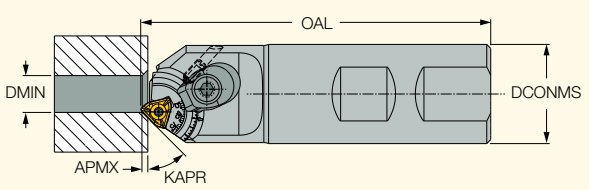
For inserts, see pages: T290 LNMT/LNHT 0502 (474) • TPMT (468)

HELI3MILL HM390 LINE

HM390 E10-80-07

Chamfering Endmill with an Adjustable Edge Angle

KAPR	DMIN	APMX	OAL
10°	5	0.35	87.15
20°	6.1	0.68	87.55
30°	7.3	1.00	87.90
40°	8.6	1.29	88.15
45°	9.3	1.41	88.20
50°	10	1.53	88.25
60°	11.3	1.73	88.20
70°	12.6	1.88	88.10
80°	13.9	1.97	87.85



Designation	CICT(1)	OAL	DCONMS	Shank(2)	MIID(3)	kg
HM390 E10-80 D05-1-W25-07	1	87.85	25.00	W	HM390 TCCT 0703PCR	0.28

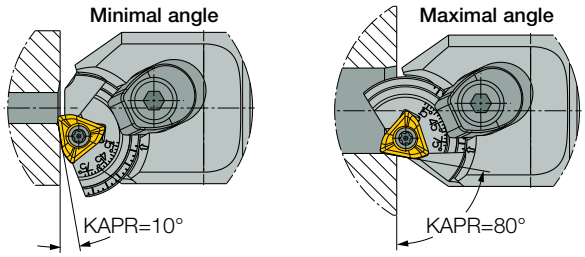
- For user guide see pages 542-548

(1) Number of inserts

(2) W-Weldon

(3) Master insert identification

For inserts, see pages: HM390 TCKT/CT 0703 (446)



Spare Parts

Designation						
HM390 E10-80 D05-1-W25-07	SR M4X10DIN912	T-7/51	CR E10-80 HM390-07	CLAMP E10-80	SR M2.5X5-T7-60	HW 3.0

MULTI-MASTER

Indexable Solid Carbide Milling Heads
Table of Contents

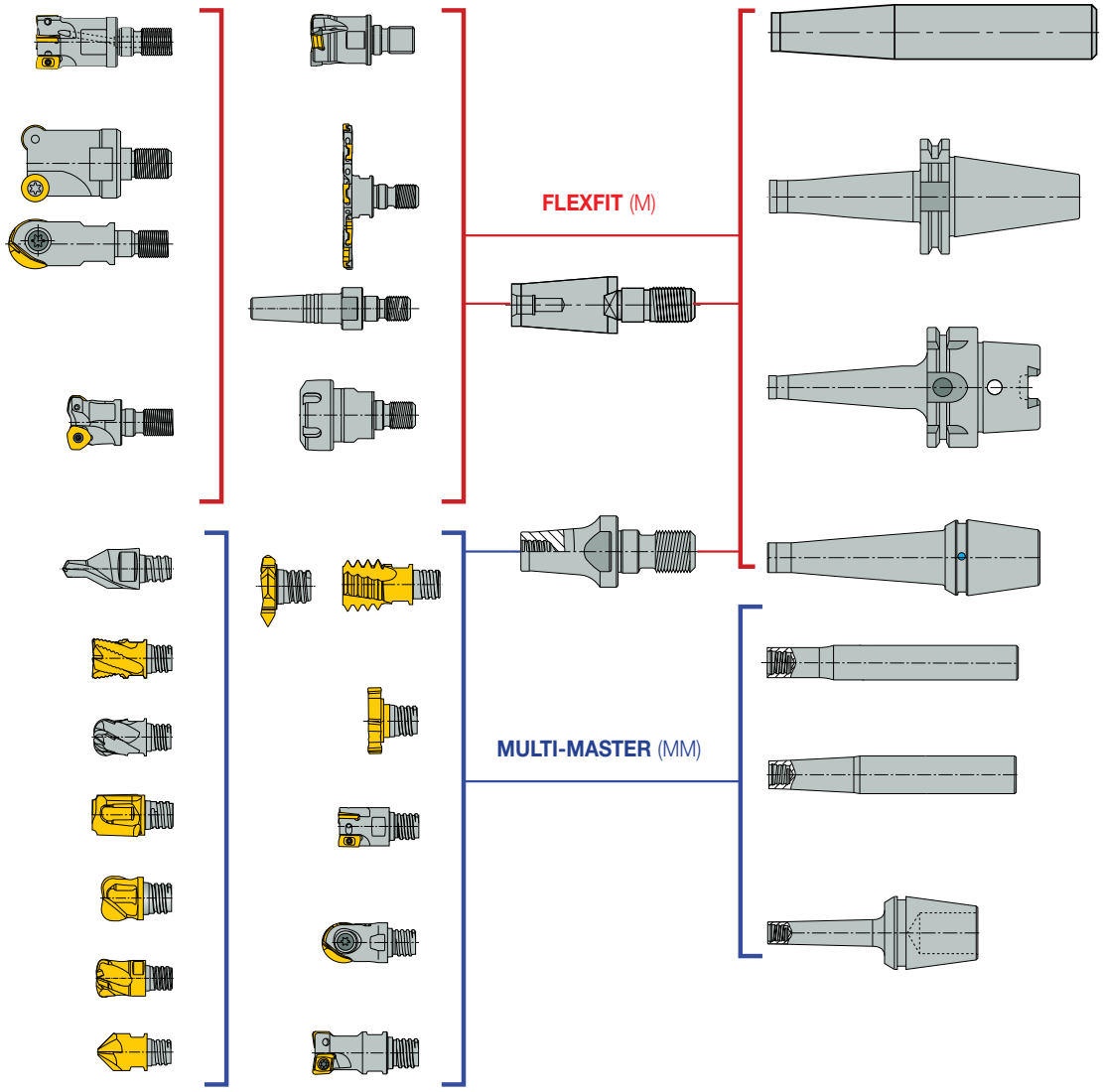
E = Economical

Indexable Solid Carbide Milling Heads
Table of Contents

Indexable Solid Carbide Milling Heads
Table of Contents

E = Economical

MULTI-MASTER and FLEXFIT Connection Options

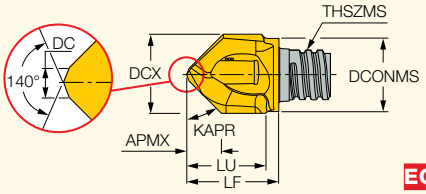


Features
Modular system reduces stock cost by using the same head with different shank options. Enables machining with larger overhang. Same head can be mounted on metric and inch combinations.

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HCD

Interchangeable 2 Flute Solid Carbide Heads for Chamfering, Countersinking and Spot Drilling



ECONOMICAL SOLUTION

Designation	Dimensions										IC908
	DCX[4]	DCXTOL	NOF[5]	LU	THSZMS	DCONMS	LF	APMX	DC	KAPR[6]	
MM HCD080-090-2T05 [1]	8.00	z9	2	7.00	T05	7.60	9.75	3.15	1.00	45.0	•
MM HCD083-090-2T05 [1]	8.30	z9	2	7.50	T05	7.60	10.00	3.56	1.00	45.0	•
MM HCD.375-080-2T06	9.50	z9	2	9.00	T06	9.20	11.80	5.00	2.00	50.0	•
MM HCD.375-100-2T06 [2]	9.50	z9	2	9.70	T06	9.50	13.40	3.60	2.00	40.0	•
MM HCD100-060-2T06	10.00	h10	2	9.30	T06	9.50	11.75	7.60	1.50	60.0	•
MM HCD100-120-2T06	10.00	h10	2	9.50	T06	9.50	12.70	2.70	1.50	30.0	•
MM HCD100-090-2T06-N [1]	10.00	z9	2	10.10	T06	9.50	14.00	4.50	1.50	45.0	•
MM HCD104-090-2T06 [1]	10.40	z9	2	9.00	T06	9.50	11.75	4.60	1.50	45.0	•
MM HCD120-060-2T08	12.00	h10	2	11.00	T08	11.50	15.40	9.24	1.50	60.0	•
MM HCD120-120-2T08	12.00	h10	2	11.65	T08	11.50	15.20	3.50	1.50	30.0	•
MM HCD120-090-2T08 [1]	12.00	z9	2	12.00	T08	11.50	15.50	5.30	1.50	45.0	•
MM HCD124-090-2T08 [1]	12.40	z9	2	11.80	T08	11.50	15.50	5.50	1.50	45.0	•
MM HCD.500-080-2T08 [3]	12.70	z9	2	11.10	T08	12.20	15.50	6.80	1.50	50.0	•
MM HCD.500-100-2T08 [2]	12.70	z9	2	10.90	T08	11.50	14.70	4.90	1.50	40.0	•
MM HCD.625-080-2T10	15.90	z9	2	15.20	T10	15.00	18.80	8.80	2.00	50.0	•
MM HCD.625-100-2T10 [2]	15.90	z9	2	14.90	T10	15.10	19.00	6.20	2.00	40.0	•
MM HCD160-060-2T10	16.00	h10	2	16.20	T10	15.20	20.20	12.00	2.50	60.0	•
MM HCD160-120-2T10	16.00	h10	2	15.50	T10	15.20	19.90	4.40	1.50	30.0	•
MM HCD160-090-2T10-N	16.00	z9	2	15.70	T10	15.20	20.00	7.40	1.50	45.0	•
MM HCD165-090-2T10 [1]	16.50	z9	2	14.90	T10	15.20	18.80	7.10	1.50	45.0	•
MM HCD.750-080-2T12	19.05	z9	2	19.60	T12	18.45	24.70	11.00	2.00	50.0	•
MM HCD.750-100-2T12 [2]	19.05	z9	2	18.50	T12	18.30	23.60	7.50	1.50	40.0	•
MM HCD200-060-2T12	20.00	h10	2	18.20	T12	18.45	24.70	15.50	2.50	60.0	•
MM HCD200-120-2T12	20.00	h10	2	14.65	T12	18.45	21.15	5.50	1.50	30.0	•
MM HCD200-090-2T12 [1]	20.00	z9	2	18.20	T12	18.45	24.70	9.40	1.50	45.0	•

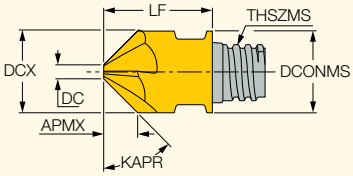
- For shanks, see pages 84-91 • Clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

[1] May be used for F-type (fine) countersink according to DIN 74.
[2] May be used for 100° countersink according to ISO 5856, DIN EN 4072, ANSI B18.6.3-1972
[3] Countersink according to American National and British standard flat screws.
[4] Cutting diameter maximum
[5] Number of flutes
[6] Tool cutting edge angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ECF

Interchangeable Solid Carbide Heads for Chamfering and Countersinking



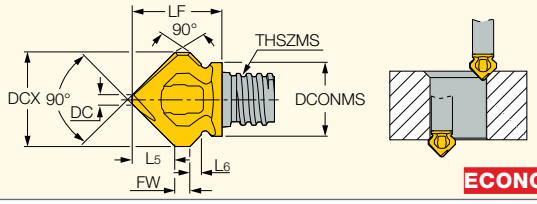
Designation	Dimensions								IC908
	KAPR(1)	DCX(2)	NOF(3)	DC	APMX	THSZMS	DCONMS	LF	
MM ECF120-02/100-4T06	30.0	10.00	4	2.00	2.30	T06	10.00	13.00	●
MM ECF120-02/120-4T08	30.0	12.00	4	2.00	2.90	T08	12.00	16.50	●
MM ECF120-03/160-6T10	30.0	16.00	6	3.00	3.70	T10	16.00	20.50	●
MM ECF120-05/200-6T12	30.0	20.00	6	5.00	4.30	T12	18.45	25.50	●
MM ECF120-06/250-6T15	30.0	25.00	6	6.00	5.40	T15	25.00	25.00	●
MM ECF45-080-4T05	45.0	8.00	4	1.95	3.00	T05	8.00	10.00	●
MM ECF45-100-4T06	45.0	10.00	4	1.95	4.00	T06	10.00	13.00	●
MM ECF45-120-4T08	45.0	12.00	4	1.95	5.00	T08	12.00	16.50	●
MM ECF45-.500-4T08	45.0	12.70	4	1.95	5.00	T08	12.70	16.50	●
MM ECF45-160-6T10	45.0	16.00	6	3.00	6.50	T10	16.00	20.50	●
MM ECF45-200-6T12	45.0	20.00	6	5.00	7.50	T12	18.45	25.50	●
MM ECF45-250-6T15-M	45.0	25.00	6	5.00	10.00	T15	25.00	25.00	●
MM ECF60-100-4T06	60.0	10.00	4	1.60	7.30	T06	10.00	13.00	●
MM ECF60-02/100-4T06	60.0	10.00	4	2.00	6.90	T06	10.00	13.00	●
MM ECF60-03/120-4T08	60.0	12.00	4	3.00	7.80	T08	12.00	16.50	●
MM ECF60-04/160-6T10	60.0	16.00	6	4.00	10.00	T10	16.00	20.50	●
MM ECF60-05/200-6T12	60.0	20.00	6	5.00	13.00	T12	18.45	25.50	●
MM ECF60-08/250-6T15	60.0	25.00	6	8.00	14.00	T15	25.00	25.00	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Tool cutting edge angle
(2) Cutting diameter maximum
(3) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HDF

Interchangeable 2 Flute Solid Carbide Heads for Upper and Bottom Chamfering



ECONOMICAL SOLUTION

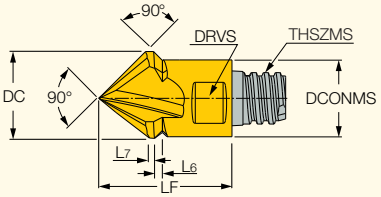
Designation	Dimensions									IC908
	DCX(1)	NOF(2)	L5	L6	FW	DC	THSZMS	DCONMS	LF	
MM HDF100-090-2T05	9.80	2	4.30	0.90	2.50	1.20	T05	7.60	10.80	MM KEY 8X5*	●
MM HDF120-090-2T06	11.80	2	5.30	1.20	2.00	1.20	T06	9.30	11.20	MM KEY 10X7*	●
MM HDF160-090-2T08	15.70	2	7.10	2.20	2.00	1.50	T08	11.50	14.00	MM KEY 13X8*	●

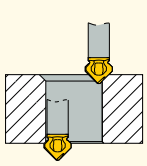
• For shanks, see pages 84-91 • Clamping keys should be ordered separately • For tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EDF

Interchangeable 3 Flute Solid Carbide Heads for Upper and Bottom Chamfering





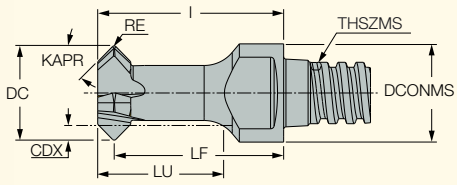
Designation	Dimensions DC	DCONMS	NOF(1)	L6	L7	LF	THSZMS	IC908
MM EDF074-090-58-3T04	7.40	5.80	3	0.90	1.00	10.00	T04	●
MM EDF094-090-76-3T05	9.40	7.60	3	0.90	1.00	12.50	T05	●
MM EDF116-090-95-3T06	11.60	9.60	3	1.00	1.00	16.50	T06	●

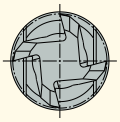
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TS-45

Interchangeable Solid Carbide Small Diameter 45° Chamfering Heads





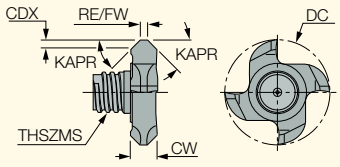
Designation	Dimensions DC	KAPR(1)	CDX(2)	RE	NOF(3)	l	THSZMS	DCONMS	LU	LF	IC908
MM TS077-45-20A-4T05	7.70	45.0	1.20	0.20	4	15.20	T05	8.00	10.3	13.85	●

• For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection
(1) Tool cutting edge angle
(2) Cutting depth maximum
(3) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-45A

Interchangeable Solid Carbide Small Diameter 45° Chamfering Heads



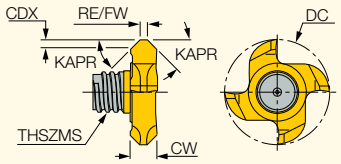
Designation	Dimensions DC	KAPR(1)	CDX(2)	RE	FW	CW	THSZMS	NOF(3)	∠	IC908
MM GRIT18K-45A-3T6	17.70	45.0	1.40	0.10	-	3.47	T06	3	T-25/3*	●
MM GRIT18P-45A-3T6	17.70	45.0	1.40	0.10	-	3.47	T06	3	T-25/3*	●
MM GRIT22K-45A-4T8	21.70	45.0	1.70	-	1.50	5.55	T08	4	T-30/3 L*	●
MM GRIT28K-45A-6T10	27.70	45.0	4.00	-	0.50	9.80	T10	6	T-40/3 L*	●

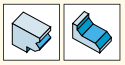
• P-TYPE - Positive geometry for soft and gummy materials. • K-Type - For general steel machining. • Modification options on request.
• Do not apply lubricant to the threaded connection. • For clamping instructions, see pages 91-92 • For shanks, see pages 84-91
(1) Tool cutting edge angle
(2) Cutting depth maximum
(3) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-K/P-45A

Interchangeable Solid Carbide Small Diameter 45° Chamfering Heads





Designation	Dimensions DC	KAPR(1)	CDX(2)	RE	FW	CW	THSZMS	NOF(3)	∠	IC528
MM GRIT 18K-45A	17.70	45.0	1.40	0.10	-	3.40	T06	3	MM EGR 16-18*	●
MM GRIT 18P-45A	17.70	45.0	1.40	0.10	-	3.40	T06	3	MM EGR 16-18*	●
MM GRIT 22K-45A	21.70	45.0	1.70	-	1.50	5.50	T08	4	MM EGR 20-22*	●
MM GRIT 22P-45A	21.70	45.0	1.70	-	1.50	5.50	T08	4	MM EGR 20-22*	●
MM GRIT 28K-45A	27.70	45.0	4.00	-	0.50	9.80	T10	6	T-40/3 L*	●

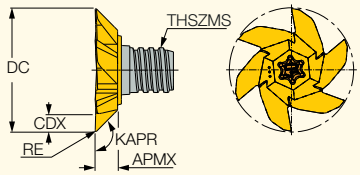
• Use carbide shanks for groove milling heads. • Keys for other milling heads must be ordered separately. • MM GRT.. shanks serve mainly for MM GRIT.. slitting heads.
• K-Type - For general steel machining. • P-Type - Positive geometry for soft and gummy materials. • For user guide see pages 44, 177-184

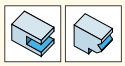
(1) Tool cutting edge angle
(2) Cutting depth maximum
(3) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT Dovetail

Interchangeable Solid Carbide Heads





Designation	Dimensions DC	KAPR(1)	CDX(2)	APMX	RE	THSZMS	NOF(3)	∠	Tough ↔ Hard IC528	IC908
MM GRIT 28K-45D-6T10	27.70	135.0	4.00	5.00	0.20	T10	6	T-40/3 L*	●	●
MM GRIT 28K-60D-6T10	27.70	120.0	4.00	7.80	0.20	T10	6	T-40/3 L*	●	●
MM GRIT 28K-75D-6T10	27.70	105.0	2.20	10.10	0.20	T10	6	T-40/3 L*	●	●

• Use carbide shanks for groove milling heads • For user guide see pages 44, 177-184

(1) Tool cutting edge angle
(2) Cutting depth maximum
(3) Number of flutes
* Optional, should be ordered separately

MM GRIT 28K-45D-6T10

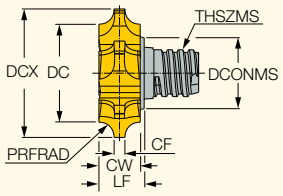
MM GRIT 28K-60D-6T10

MM GRIT 28K-75D-6T10

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT 28P-DR

Interchangeable 6 Flute Solid Carbide Double-Sided Corner Rounding Milling Heads



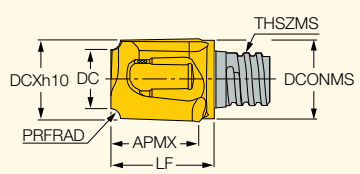
Designation	Dimensions PRFRAD	CF	DCX(1)	DC	LF	CW	NOF(2)	THSZMS	DCONMS		Tough ↔ Hard IC528	IC908
MM GRIT 28P-2.7-DR1.0	1.00	2.70	27.70	24.80	6.00	5.60	6	T10	15.30	T-40/3 L*	•	•
MM GRIT 28P-2.6-DR2.0	2.00	2.60	27.70	22.90	7.70	7.30	6	T10	15.30	T-40/3 L*	•	•
MM GRIT 28P-2.3-DR3.0	3.00	2.30	27.70	21.10	9.70	8.90	6	T10	15.30	T-40/3 L*	•	•
MM GRIT 28P-2.6-DR4.0	4.00	2.60	27.70	19.70	11.70	10.90	6	T10	15.30	T-40/3 L*	•	•

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HR

Interchangeable 2 Flute Solid Carbide Corner Rounding Milling Heads



ECONOMICAL SOLUTION

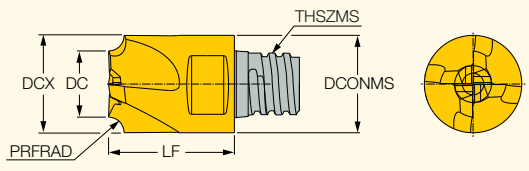
Designation	Dimensions DCX(1)	PRFRAD	Tm(2)	NOF(3)	DC	APMX	THSZMS	DCONMS	LF	IC908
MM HR1.0/047-5.8-2T05	8.00	1.00	r0.5-3.0	2	5.80	7.50	T05	7.60	10.60	•
MM HR1.6/063-6.8-2T06	10.00	1.60	r0.5-3.0	2	6.80	9.50	T06	9.50	12.50	•
MM HR2.0/078-6.0-2T06	10.00	2.00	r0.5-3.0	2	6.00	9.50	T06	9.50	12.50	•
MM HR2.5/094-5.1-2T06	10.00	2.50	r0.5-3.0	2	5.10	9.50	T06	9.50	12.50	•
MM HR3.0/125-6.5-2T08	12.70	3.00	r0.5-4.0	2	6.50	12.00	T08	11.50	15.60	•
MM HR4.0/156-4.7-2T08	12.70	4.00	r0.5-4.0	2	4.70	12.00	T08	11.50	15.60	•
MM HR5.0/188-6.2-2T10	16.00	5.00	r0.5-5.0	2	6.20	15.00	T10	15.20	19.10	•
MM HR6.0/236-8.0-2T12	20.00	6.00	r0.5-6.0	2	8.00	7.00	T12	18.45	17.40	•

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Specially tailored radius range upon request.
(3) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ER

Interchangeable 4 Flute Solid Carbide Corner Rounding Milling Heads

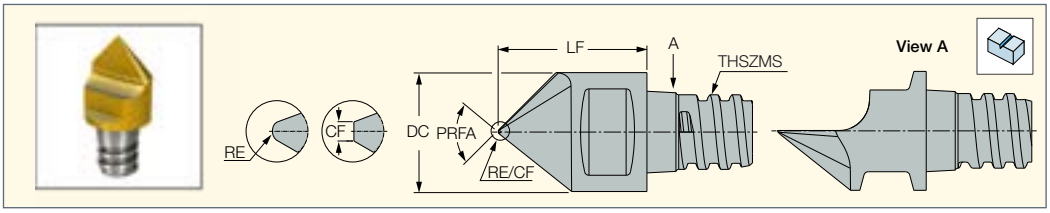


Designation	Dimensions PRFRAD	Tm(1)	DC	DCX(2)	DCONMS	NOF(3)	LF	THSZMS	IC908
MM ER1.0/047-5.8-4T05	1.00	0.5-1.4	5.80	8.00	8.00	4	10.00	T05	•
MM ER1.6/063-6.8-4T06	1.60	0.5-2.5	6.80	10.00	10.00	4	13.00	T06	•
MM ER2.0/078-6.0-4T06	2.00	0.5-2.5	6.00	10.00	10.00	4	13.00	T06	•
MM ER2.5/094-5.1-4T06	2.50	0.5-2.5	5.10	10.00	10.00	4	13.00	T06	•
MM ER3.0/125-6.5-4T08	3.00	0.5-3.1	6.50	12.70	12.70	4	16.50	T08	•

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Specially tailored radius range upon request.
(2) Cutting diameter maximum
(3) Number of flutes

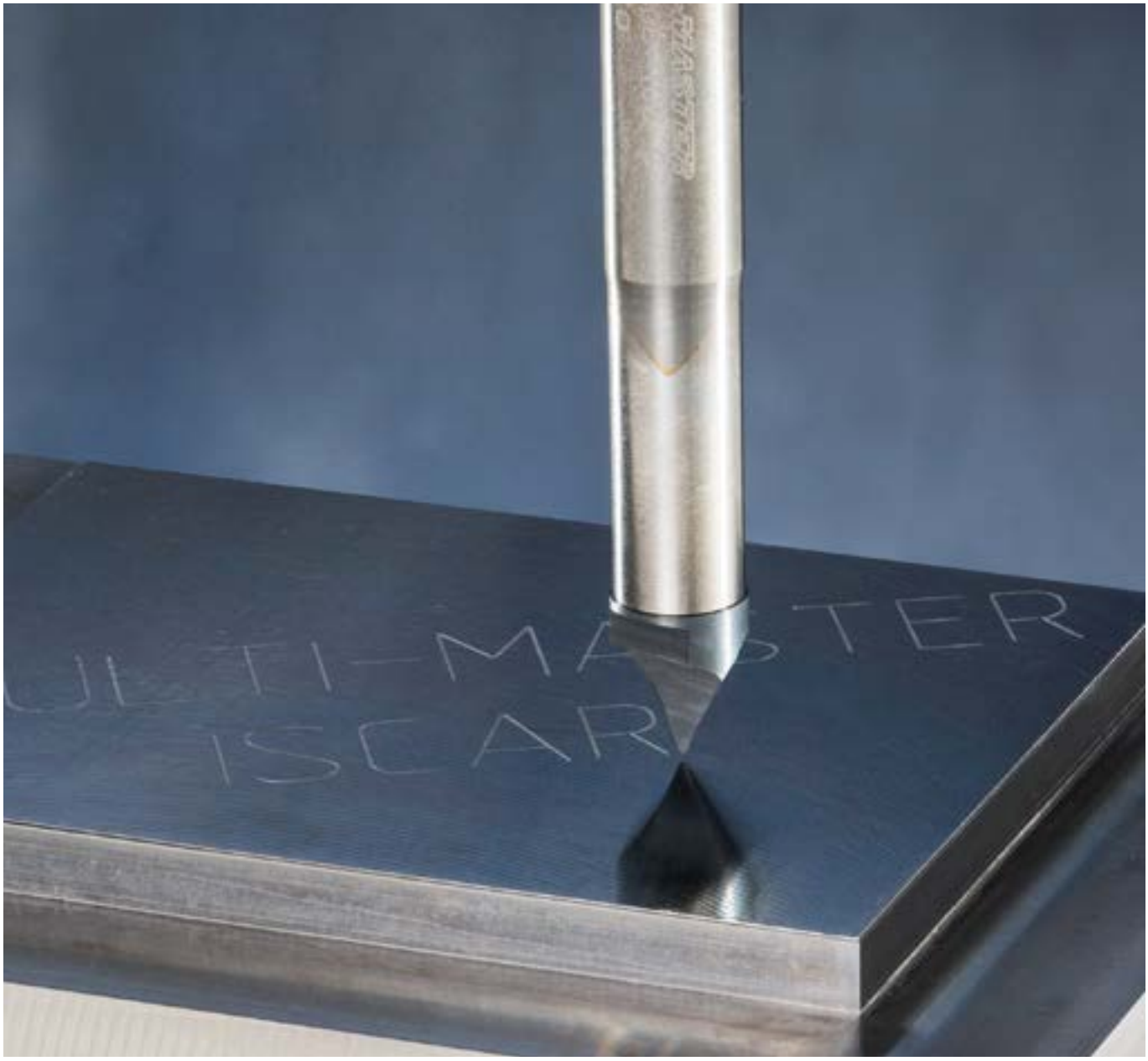
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EPG
Single Flute MULTI-MASTER
Engraving Tool Head



Designation	Dimensions						IC908
	DC	RE	CF[1]	PRFA	LF	THSZMS	
MM EPG080/30-1T05	8.00	0.20	-	30.00	10.00	T05	●
MM EPG080/45-1T05	8.00	0.20	-	45.00	10.00	T05	●
MM EPG080/60-1T05	8.00	0.20	-	60.00	10.00	T05	●
MM EPG080/90-1T05	8.00	0.20	-	90.00	10.00	T05	●
MM EPG080/60-F50-1T05	8.00	-	0.50	60.00	10.00	T05	●
MM EPG080/60-F75-1T05	8.00	-	0.75	60.00	10.00	T05	●
MM EPG080/90-F32-1T05	8.00	-	0.32	90.00	10.00	T05	●
MM EPG080/90-F50-1T05	8.00	-	0.50	90.00	10.00	T05	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection
(1) Frontal corner flat



SOLIDDRILL

MULTI-MASTER

MM ECS

Interchangeable Solid Carbide Centering Drills (DIN 332)

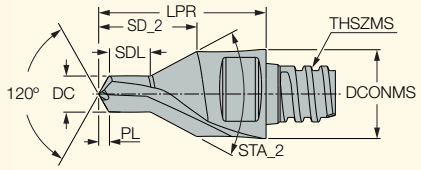


Fig. 1 Type A

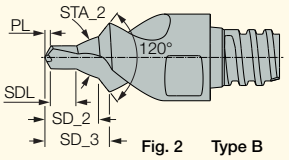
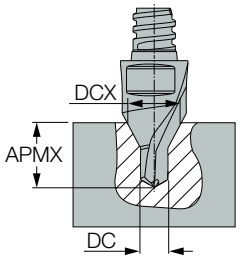


Fig. 2 Type B

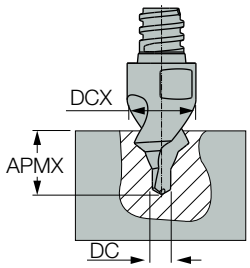
Designation	Dimensions										IC908
	DC	DCONMS	THSZMS	LPR	SDL	SD_2	SD_3	STA_2	PL	Fig.	
MM ECS-A1.00X06-2T04	1.07	6.00	T04	10.00	1.32	4.14	-	60.0	0.280	1	●
MM ECS-A1.60X06-2T04	1.65	6.00	T04	10.00	1.97	4.45	-	60.0	0.430	1	●
MM ECS-A2.00X06-2T04	2.07	6.00	T04	10.00	2.36	6.37	-	60.0	0.540	1	●
MM ECS-A3.15X08-2T05	3.28	8.00	T05	15.00	3.75	8.76	-	60.0	0.850	1	●
MM ECS-A4.00X10-2T06	4.12	10.00	T06	19.00	4.83	11.05	-	60.0	1.070	1	●
MM ECS-A5.00X12-2T08	5.13	12.00	T08	23.00	5.88	13.23	-	60.0	1.320	1	●
MM ECS-A6.30X16-2T10	6.46	16.00	T10	28.00	7.25	17.18	-	60.0	1.650	1	●
MM ECS-B3.15X12-2T08	3.24	12.00	T08	23.00	3.55	7.40	8.94	60.0	0.830	2	●
MM ECS-B4.00X127-2T08	4.09	12.70	T08	23.00	4.53	9.50	10.71	60.0	1.070	2	●
MM ECS-B5.00X19-2T12	5.09	18.45	T12	25.50	5.56	11.70	14.17	60.0	1.330	2	●
MM ECS-B6.30X20-2T12	6.41	18.45	T12	25.50	6.95	14.50	16.58	60.0	1.680	2	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184



	ISO	IC908 *Vcxfz [m/minxmm/tooth]						
		MM ECS-A1.00X06-2T04	MM ECS-A1.60X06-2T04	MM ECS-A2.00X06-2T04	MM ECS-A3.15X08-2T05	MM ECS-A4.00X10-2T06	MM ECS-A5.00X12-2T08	MM ECS-A6.30X16-2T10
		DCX=2.12, APMX=2.5	DCX=3.35, APMX=3.9	DCX=4.25, APMX=4.8	DCX=6.70, APMX=7.60	DCX=8.50, APMX=9.80	DCX=10.60, APMX=12.00	DCX=13.20, APMX=14.80
P	4340 24-29HRC	80x0.020	80x0.025	80x0.025	80x0.030	80x0.040	80x0.050	80x0.060
P	4340 38-42HRC	65x0.020	65x0.025	65x0.025	65x0.030	65x0.040	65x0.050	65x0.060
M	316L MAX-215 HB	50x0.015	50x0.020	50x0.020	50x0.025	50x0.030	50x0.040	50x0.040
S	Inconel 718	15x0.010	15x0.010	15x0.015	15x0.015	15x0.020	15x0.020	15x0.025

* V_c Calculated for ØDC



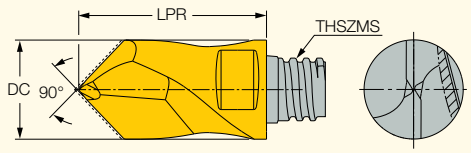
	ISO	IC908 *Vcxfz [m/minxmm/tooth]			
		MM ECS-A3.15X12-2T08	MM ECS-A4.00X127-2T08	MM ECS-A5.00X19-2T12	MM ECS-A6.30X20-2T12
		DCX=10.00, APMX=8.80	DCX=12.50, APMX=11.00	DCX=16.00, APMX=13.900	DCX=18.00, APMX=16.80
P	4340 24-29HRC	75x0.030	75x0.040	75x0.050	75x0.060
P	4340 38-42HRC	60x0.030	60x0.040	60x0.050	60x0.060
M	316L MAX-215 HB	45x0.025	45x0.030	45x0.040	45x0.040
S	Inconel 718	12x0.015	12x0.020	12x0.020	12x0.025

* V_c Calculated for ØDC

SOLIDDRILL
MULTI-MASTER

MM ECD

NC Spotting Drills for Accurately Locating a Hole without Using a Guide Bushing



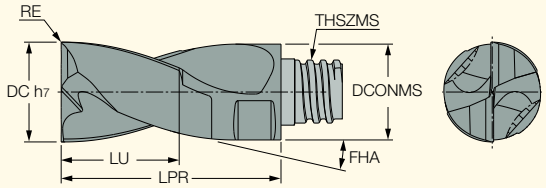
Designation	Dimensions DC	LPR	THSZMS	IC908
MM ECD-06X90-2T04	6.00	11.00	T04	●
MM ECD-08X90-2T05	8.00	15.00	T05	●
MM ECD-10X90-2T06	10.00	19.00	T06	●
MM ECD-12X90-2T08	12.00	23.00	T08	●
MM ECD-16X90-2T10	16.00	28.00	T10	●

- For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection

SOLIDDRILL
MULTI-MASTER

MM ECDF

MULTI-MASTER
Exchangeable Solid Carbide
Flat Bottom Drill Heads



Designation	Dimensions DC	DCONMS	NOF(1)	LU	LPR	RE	FHA	THSZMS	IC908
MM ECDF080A100-2T05	8.00	7.70	2	12.00	22.00	0.00	30.0	T05	●
MM ECDF085A120-2T05	8.50	7.70	2	12.00	22.00	0.00	30.0	T05	●
MM ECDF090A120-2T05	9.00	7.70	2	12.00	22.00	0.00	30.0	T05	●
MM ECDF095A120-2T06	9.50	9.20	2	12.00	22.00	0.00	30.0	T06	●
MM ECDF100A120-2T06	10.00	9.60	2	12.00	22.00	0.00	30.0	T06	●
MM ECDF105A120-2T06	10.50	9.60	2	12.00	23.00	0.00	30.0	T06	●
MM ECDF110A120-2T06	11.00	9.60	2	12.00	23.00	0.00	30.0	T06	●
MM ECDF115A120-2T06	11.50	9.60	2	12.00	23.00	0.00	30.0	T06	●
MM ECDF120A150-2T08	12.00	11.70	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF125A150-2T08	12.50	12.10	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF130A150-2T08	13.00	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF135A150-2T08	13.50	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF140A150-2T08	14.00	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF145A150-2T08	14.50	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF150A150-2T08	15.00	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF155A150-2T08	15.50	12.20	2	15.00	27.00	0.00	30.0	T08	●
MM ECDF160A200-2T10	16.00	15.30	2	20.00	33.50	0.00	30.0	T10	●
MM ECDF165A200-2T10	16.50	15.30	2	20.00	33.50	0.00	30.0	T10	●
MM ECDF170A200-2T10	17.00	15.30	2	20.00	33.50	0.00	30.0	T10	●
MM ECDF175A200-2T10	17.50	15.30	2	20.00	33.50	0.00	30.0	T10	●
MM ECDF180A200-2T10	18.00	15.30	2	20.00	33.50	0.00	30.0	T10	●
MM ECDF185A200-2T12	18.50	18.20	2	25.00	41.00	0.00	30.0	T12	●
MM ECDF190A250-2T12	19.00	18.30	2	25.00	41.00	0.00	30.0	T12	●
MM ECDF195A250-2T12	19.50	18.30	2	25.00	41.00	0.00	30.0	T12	●
MM ECDF200A250-2T12	20.00	18.45	2	25.00	41.00	0.00	30.0	T12	●

- For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

(1) Number of flutes

ISO	Material		Condition	Tensile Strength [N/mm²]	Kc1(1) [N/mm²]	mc(2)	Hardness HB	Material Group No.	V m/min	Feed vs. Flat-Drill Diameter DC=18.0-25.4 frev mm/rev	DC=16.0-17.9	DC=13.0-15.9	DC=10.0-12.9	DC=8.0-9.9
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	1350	0.21	125	1	80-110-140	0.08	0.10	0.12	0.14	0.18
		>= 0.25 %C	Annealed	650	1500	0.22	190	2		0.10	0.12	0.15	0.17	0.21
		< 0.55 %C	Quenched and tempered	850	1675	0.24	250	3		0.12	0.14	0.18	0.20	0.24
		>= 0.55 %C	Annealed	750	1700	0.24	220	4						
			Quenched and tempered	1000	1900	0.24	300	5	80-105-130					
	Low alloy and cast steel (less than 5% of alloying elements)		Annealed	600	1775	0.24	200	6						
			Quenched and tempered	930	1675	0.24	275	7	60-80-100					
				1000	1725	0.24	300	8						
				1200	1800	0.24	350	9		0.06	0.06	0.08	0.10	0.12
	High alloyed steel, cast steel and tool steel		Annealed	680	2450	0.23	200	10		0.08	0.08	0.10	0.12	0.14
			Quenched and tempered	1100	2500	0.23	325	11		0.10	0.10	0.12	0.14	0.16
	Stainless steel and cast steel		Ferritic/ martensitic	680	1875	0.21	200	12	60-80-100	0.01	0.02	0.03	0.04	0.06
			Martensitic	820	1875	0.21	240	13		0.02	0.03	0.04	0.05	0.07
										0.03	0.04	0.05	0.06	0.08
M	Stainless steel and cast steel		Austenitic, duplex	600	2150	0.20	180	14	60-80-100	0.01	0.02	0.03	0.04	0.06
										0.02	0.03	0.04	0.05	0.07
										0.03	0.04	0.05	0.06	0.08
K	Grey cast iron (GG)		Ferritic/ pearlitic		1150	0.20	180	17	80-120-160					
			Pearlitic / martensitic		1350	0.28	260	18		0.08	0.10	0.14	0.16	0.18
	Cast iron nodular (GGG)		Ferritic		1225	0.25	160	15		0.10	0.12	0.16	0.18	0.20
			Pearlitic		1350	0.28	250	16		0.12	0.14	0.18	0.20	0.22
	Malleable cast iron		Ferritic		1225	0.25	130	19						
			Pearlitic		1420	0.30	230	20						

■ recommended cutting data

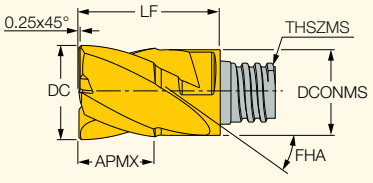
Spare Parts

Designation	
MM ECDF080A100-2T05	MM KEY 6X4*
MM ECDF100A120-2T06	MM KEY 8X5*
MM ECDF120A150-2T08	MM KEY 10X7*
MM ECDF160A200-2T10	MM KEY 13X8*
MM ECDF200A250-2T12	MM KEY 16X9*

* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EFCB
Interchangeable 4 Flute 30° Helix Solid Carbide Heads for Flat Counter Boring



Designation	Dimensions DC(1)	APMX	LF	DCONMS	THSZMS	NOF(2)	FHA	CHW	KCH	IC908	Recommended Machining Data f_z (mm/t)
MM EFCB110A08-4T06	11.00	8.40	16.50	10.00	T06	4	30.0	45.0	0.25	●	0.03-0.04
MM EFCB140A11-4T08	14.00	11.50	28.00	12.00	T08	4	30.0	45.0	0.25	●	0.04-0.05

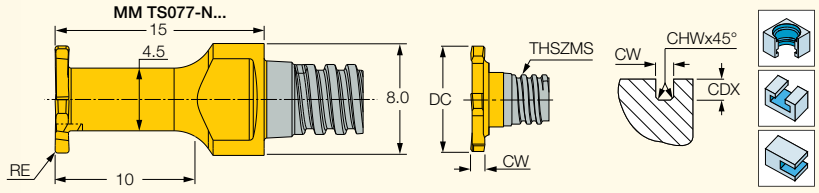
- 0.06 mm maximum concavity on the tool's bottom • For shanks, see pages 84-91
- For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

(1) e8 tolerance
(2) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TS-N

Interchangeable Solid Carbide T-Slot Milling Heads



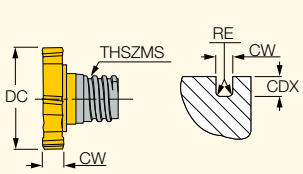
Designation	Dimensions DC	DCTOLL	CW	NOF(1)	THSZMS	CDX(2)	RE	CHW			Tough ↔ Hard IC328	IC928	IC908
MM TS077-N07A-4T05	7.70	-0.05	0.70	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS077-N08A-4T05	7.70	-0.05	0.80	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS077-N09A-4T05	7.70	-0.05	0.90	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS077-N10A-4T05	7.70	-0.05	1.00	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS077-N15A-4T05	7.70	-0.05	1.50	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS077-N20A-4T05	7.70	-0.05	2.00	4	T05	1.20	0.20	-	MM KEY 6X4*				●
MM TS105-N20D-06T04	10.50	-0.05	2.00	6	T04	2.00	0.40	-		T-15/3*		●	
MM TS.500-N062P-06T05	12.70	-0.05	1.58	6	T05	2.25	-	0.15		T-20/3*	●		●
MM TS.500-N078P-06T05	12.70	-0.05	1.98	6	T05	2.25	-	0.15		T-20/3*	●		●
MM TS135-N20P-06T05	13.50	-0.05	2.00	6	T05	2.65	-	0.20		T-20/3*	●		●
MM TS135-N25P-06T05	13.50	-0.05	2.50	6	T05	2.65	-	0.20		T-20/3*	●		●

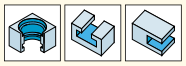
• For shanks, see pages 84-91 • For tightening torques and clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection
• For user guide see pages 44, 177-184
(1) Number of flutes
(2) Cutting depth maximum
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TS-H

Interchangeable Solid Carbide T-Slot Milling Heads with Various Corner Radii





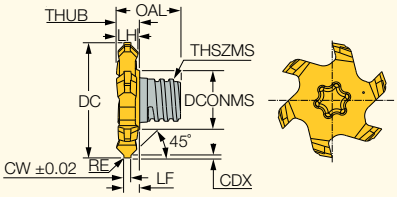
Designation	Dimensions DC	DCTOLL	CW	CDX(1)	NOF(2)	RE	THSZMS		Tough ↔ Hard IC328	IC908
MM TS135-H30D-06T05	13.50	-0.05	3.00	2.65	6	0.40	T05	T-20/3*	●	●
MM TS135-H40D-06T05	13.50	-0.05	4.00	2.65	6	0.40	T05	T-20/3*	●	●
MM TS165-H40A-06T05	16.50	-0.05	4.00	4.25	6	0.20	T05	T-20/3*	●	●
MM TS160-H20D-06T06	16.00	-0.05	2.00	3.00	6	0.40	T06	T-20/3*	●	●
MM TS160-H30D-06T06	16.00	-0.05	3.00	3.00	6	0.40	T06	T-25/3*	●	●
MM TS160-H40D-06T06	16.00	-0.05	4.00	3.00	6	0.40	T06	T-25/3*	●	●
MM TS165-H20D-06T06	16.50	-0.05	2.00	3.25	6	0.40	T06	T-20/3*	●	●
MM TS165-H30D-06T06	16.50	-0.05	3.00	3.25	6	0.40	T06	T-25/3*	●	●
MM TS165-H40D-06T06	16.50	-0.05	4.00	3.25	6	0.40	T06	T-25/3*	●	●
MM TS195-H60A-06T06	19.50	-0.05	6.00	4.45	6	0.20	T06	T-25/3*	●	●
MM TS225-H60A-06T06	22.50	-0.05	6.00	5.95	6	0.20	T06	T-25/3*	●	●
MM TS195-H40D-06T08	19.50	-0.05	4.00	3.45	6	0.40	T08	T-30/3 L*	●	●
MM TS195-H50D-06T08	19.50	-0.05	5.00	3.45	6	0.40	T08	T-30/3 L*	●	●
MM TS195-H60D-06T08	19.50	-0.05	6.00	3.45	6	0.40	T08	T-30/3 L*	●	●
MM TS225-H40D-06T08	22.50	-0.05	4.00	4.90	6	0.40	T08	T-40/3 L*	●	●
MM TS225-H50D-06T08	22.50	-0.05	5.00	4.95	6	0.40	T08	T-40/3 L*	●	●
MM TS225-H60D-06T08	22.50	-0.05	6.00	4.95	6	0.40	T08	T-40/3 L*	●	●
MM TS225-H80D-06T08	22.50	-0.05	8.00	4.95	6	0.40	T08	T-40/3 L*	●	●
MM TS250-H50D-06T08	25.00	-0.05	5.00	5.90	6	0.40	T08	T-50/3 L*	●	●
MM TS250-H60D-06T08	25.00	-0.05	6.00	5.90	6	0.40	T08	T-50/3 L*	●	●
MM TS250-H80D-06T08	25.00	-0.05	8.00	5.90	6	0.40	T08	T-50/3 L*	●	●
MM TS250-H50D-06T10	25.00	-0.05	5.00	4.30	6	0.40	T10	T-50/3 L*	●	●
MM TS250-H60D-06T10	25.00	-0.05	6.00	4.30	6	0.40	T10	T-50/3 L*	●	●
MM TS250-H80D-06T10	25.00	-0.05	8.00	4.30	6	0.40	T10	T-50/3 L*	●	●

• Inserts in 5 mm and wider feature chip splitting edges • For tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For shanks, see pages 84-91 • For user guide see pages 44, 177-184
(1) Cutting depth maximum
(2) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TS-C

Interchangeable Solid Carbide Circlip Groove Milling Heads According to DIN 471/472



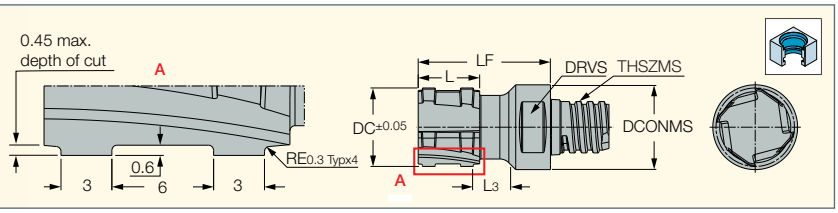
Designation	Dimensions DC	CW	CDX	LF	t	RE	THUB	LH	OAL	DCONMS	NOF(1)	THSZMS		IC928
MM TS127C118T035-6T05	12.70	1.18	0.35	2.23	0.27	0.05	3.00	2.7	8.43	7.70	6	T05	T-20/3*	•
MM TS127C118T040-6T05	12.70	1.18	0.40	2.23	0.32	0.05	3.00	2.7	8.43	7.70	6	T05	T-20/3*	•
MM TS127C118T050-6T05	12.70	1.18	0.50	2.23	0.42	0.05	3.00	2.7	8.43	7.70	6	T05	T-20/3*	•
MM TS127C138T050-6T05	12.70	1.38	0.50	2.23	0.42	0.05	3.00	2.7	8.63	7.70	6	T05	T-20/3*	•
MM TS225C138T060-6T08	22.50	1.38	0.60	3.08	0.50	0.05	4.50	4.2	9.48	11.70	6	T08	T-40/3 L*	•
MM TS225C138T070-6T08	22.50	1.38	0.70	3.08	0.60	0.05	4.50	4.2	9.48	11.70	6	T08	T-40/3 L*	•
MM TS225C138T085-6T08	22.50	1.38	0.85	3.08	0.74	0.05	4.50	4.2	9.48	11.70	6	T08	T-40/3 L*	•
MM TS225C168T070-6T08	22.50	1.68	0.70	3.23	0.60	0.10	4.50	4.2	9.78	11.70	6	T08	T-40/3 L*	•
MM TS225C168T085-6T08	22.50	1.68	0.85	3.23	0.74	0.10	4.50	4.2	9.78	11.70	6	T08	T-40/3 L*	•
MM TS225C168T100-6T08	22.50	1.68	1.00	3.23	0.89	0.10	4.50	4.2	9.78	11.70	6	T08	T-40/3 L*	•
MM TS225C193T100-6T08	22.50	1.93	1.00	3.35	0.89	0.10	4.50	4.2	10.03	11.70	6	T08	T-40/3 L*	•
MM TS225C193T125-6T08	22.50	1.93	1.25	3.35	1.13	0.10	4.50	4.2	10.03	11.70	6	T08	T-40/3 L*	•
MM TS225C223T150-6T08	22.50	2.23	1.50	3.50	1.38	0.10	4.50	4.2	10.33	11.70	6	T08	T-40/3 L*	•
MM TS225C273T150-6T08	22.50	2.73	1.50	3.77	1.39	0.20	4.50	4.1	10.83	11.70	6	T08	T-40/3 L*	•
MM TS225C273T175-6T08	22.50	2.73	1.75	3.77	1.64	0.20	4.40	3.9	10.83	11.70	6	T08	T-40/3 L*	•
MM TS225C325T175-6T08	22.50	3.25	1.75	4.40	1.64	0.20	5.10	4.6	11.35	11.70	6	T08		•

• For shanks, see pages 84-91 • For tightening torques and clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection
• For user guide see pages 44, 177-184
(1) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

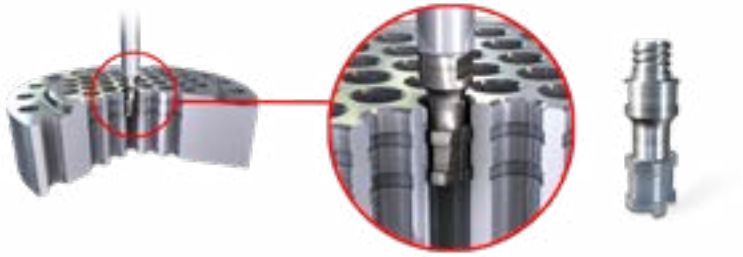
MM TS-DG

Double Groove Internal Grooving Heads with a Threaded Connection for Tube Sheets of Heat Exchangers



Designation	Dimensions DC	DCONMS	PHD(1)	THSZMS	NOF(2)	LF	L3	L	DRVS(3)		IC908
MM TS155-04T10-8238	15.50	16.00	15.88	T10	4	34.00	18.10	14.10	10.0	MM KEY 10X7*	•
MM TS185-04T12-8239	18.50	18.45	19.05	T12	4	34.50	18.30	14.50	13.0	MM KEY 13X8*	•
MM TS245-04T15-8240	24.50	23.90	25.40	T15	4	37.40	11.00	14.40	20.0	MM KEY 20*	•

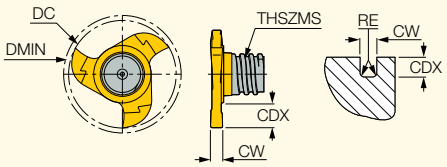
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For user guide see pages 44, 177-184
(1) For minimum tube outer diameter
(2) Number of flutes
(3) Clamping wrench size
* Optional, should be ordered separately



MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-16K/P,18K/P

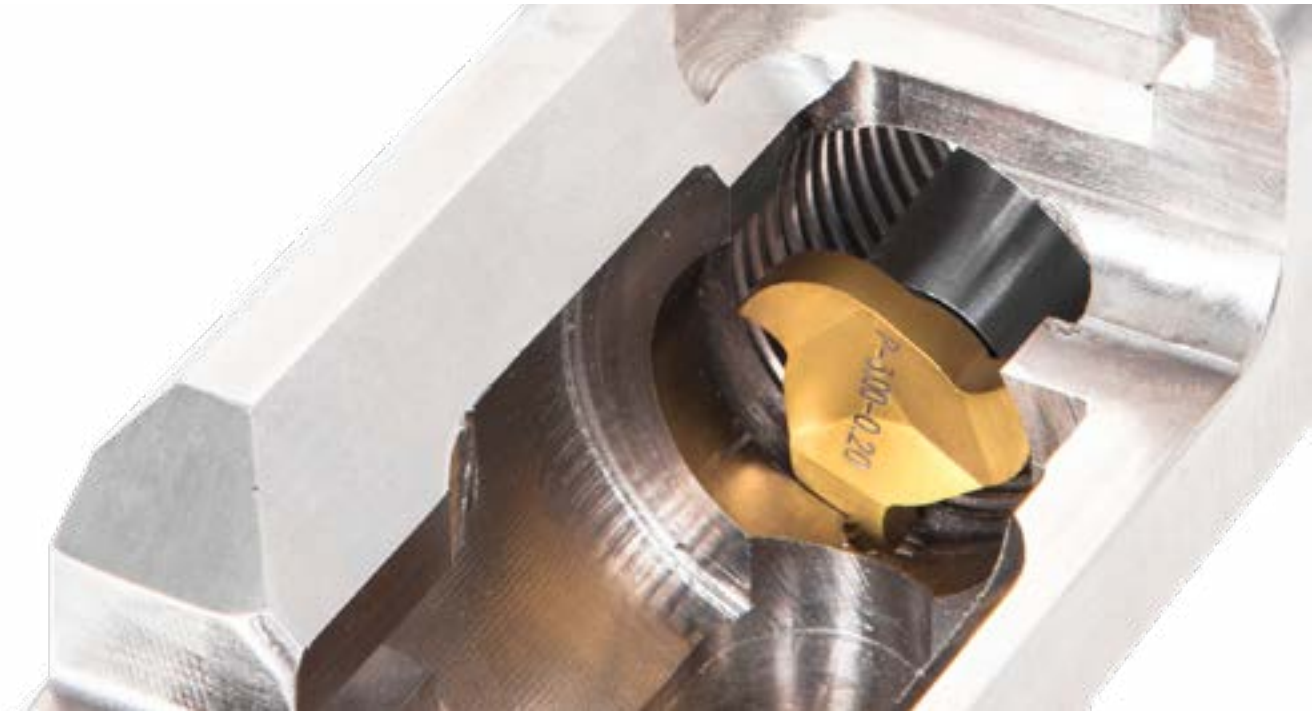
Interchangeable Solid Carbide Small Diameter Groove Milling Heads



Designation	Dimensions DC	CW	CDX[2]	NOF[3]	RE	DMIN[4]	THSZMS		IC528
MM GRIT 16K-1.50-0.10	15.70	1.50	2.80	3	0.10	16.00	T06	MM EGR 16-18*	●
MM GRIT 16P-1.50-0.10	15.70	1.50	2.80	3	0.10	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-1.57-0.20	15.70	1.57	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-2.00-0.20	15.70	2.00	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16P-2.20-1.10	15.70	2.20	2.80	3	1.10	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-2.39-0.20	15.70	2.39	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-2.50-0.20	15.70	2.50	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-3.00-0.20	15.70	3.00	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16P-3.00-0.20	15.70	3.00	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 16K-3.17-0.20	15.70	3.17	2.80	3	0.20	16.00	T06	MM EGR 16-18*	●
MM GRIT 18K-1.20-0.05 (1)	17.70	1.20	3.80	3	0.05	18.00	T06	MM EGR 16-18*	●
MM GRIT 18P-1.20-0.60	17.70	1.20	3.80	3	0.60	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-1.40-0.05 (1)	17.70	1.40	3.80	3	0.05	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-1.50-0.10	17.70	1.50	3.80	3	0.10	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-1.57-0.20	17.70	1.57	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-1.70-0.05 (1)	17.70	1.70	3.80	3	0.05	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-2.00-0.20	17.70	2.00	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●
MM GRIT 18P-2.00-1.00	17.70	2.00	3.80	3	1.00	18.00	T06	MM EGR 16-18*	●
MM GRIT 18P-2.20-1.10	17.70	2.20	3.80	3	1.10	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-2.39-0.20	17.70	2.39	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-2.50-0.20	17.70	2.50	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-3.00-0.20	17.70	3.00	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●
MM GRIT 18P-3.00-1.50	17.70	3.00	3.80	3	1.50	18.00	T06	MM EGR 16-18*	●
MM GRIT 18K-3.17-0.20	17.70	3.17	3.80	3	0.20	18.00	T06	MM EGR 16-18*	●

- Recommended for O-rings and retaining rings • MM EGR clamping key is supplied with each MM GRT... shank • Modification options on request
- Do not apply lubricant to the threaded connection • For clamping instructions, see pages 91-92
- For shanks, see pages 84-91 • K - For general steel machining • P - Positive geometry for soft and gummy materials • Use carbide shanks for groove milling heads.
- Keys for other milling heads must be ordered separately. • MM GRT.. shanks serve mainly for MM GRIT.. slitting heads.
- K-Type - For general steel machining. • P-Type - Positive geometry for soft and gummy materials. • For user guide see pages 44, 177-184

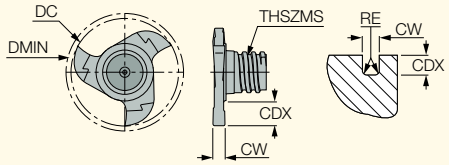
(1) For circle clips according to DIN 471/472 and ANSI B27.7M
(2) Cutting depth maximum
(3) Number of flutes
(4) Minimum bore diameter
* Optional, should be ordered separately

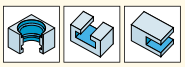


MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-16K/P,18K/P 3T6

Interchangeable Solid
Carbide Small Diameter
Groove Milling Heads





Designation	Dimensions								IC908
	DC	CW	CDX(1)	NOF(2)	RE	DMIN(3)	THSZMS	∠	
MM GRIT16K150-010-3T6	15.70	1.50	2.80	3	0.10	16.00	T06	T-20/3*	●
MM GRIT16P150-010-3T6	15.70	1.50	2.80	3	0.10	16.00	T06	T-20/3*	●
MM GRIT16K157-020-3T6	15.70	1.57	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT16K200-020-3T6	15.70	2.00	2.80	3	0.20	16.00	T06	T-20/3*	●
MM GRIT16P220-110-3T6	15.70	2.20	2.80	3	1.10	16.00	T06	T-20/3*	●
MM GRIT16K239-020-3T6	15.70	2.39	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT16K250-020-3T6	15.70	2.50	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT16K300-020-3T6	15.70	3.00	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT16P300-020-3T6	15.70	3.00	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT16K317-020-3T6	15.70	3.17	2.80	3	0.20	16.00	T06	T-25/3*	●
MM GRIT18K120-005-3T6	17.70	1.20	3.80	3	0.05	18.00	T06	T-20/3*	●
MM GRIT18P120-060-3T6	17.70	1.20	3.80	3	0.60	18.00	T06	T-20/3*	●
MM GRIT18K140-005-3T6	17.70	1.40	3.80	3	0.05	18.00	T06	T-20/3*	●
MM GRIT18K150-010-3T6	17.70	1.50	3.80	3	0.10	18.00	T06	T-20/3*	●
MM GRIT18K157-020-3T6	17.70	1.57	3.80	3	0.20	18.00	T06	T-20/3*	●
MM GRIT18K170-005-3T6	17.70	1.70	3.80	3	0.05	18.00	T06	T-20/3*	●
MM GRIT18K200-020-3T6	17.70	2.00	3.80	3	0.20	18.00	T06	T-20/3*	●
MM GRIT18P200-100-3T6	17.70	2.00	3.80	3	1.00	18.00	T06	T-20/3*	●
MM GRIT18P220-110-3T6	17.70	2.20	3.80	3	1.10	18.00	T06	T-20/3*	●
MM GRIT18K239-020-3T6	17.70	2.39	3.80	3	0.20	18.00	T06	T-20/3*	●
MM GRIT18K250-020-3T6	17.70	2.50	3.80	3	0.20	18.00	T06	T-20/3*	●
MM GRIT18K300-020-3T6	17.70	3.00	3.80	3	0.20	18.00	T06	T-25/3*	●
MM GRIT18P300-150-3T6	17.70	3.00	3.80	3	1.50	18.00	T06	T-25/3*	●
MM GRIT18K317-020-3T6	17.70	3.17	3.80	3	0.20	18.00	T06	T-25/3*	●

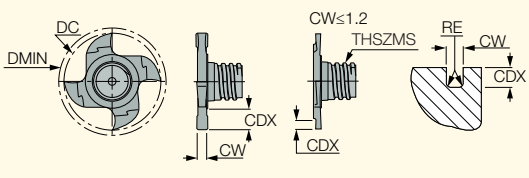
- Recommended for O-rings and retaining rings • Modification options on request • Do not apply lubricant to the threaded connection
- For clamping instructions, see pages 91-92 • For shanks, see pages 84-91 • K-Type - For general steel machining
- P-Type - Positive geometry for soft and gummy materials • Use carbide shanks for groove milling heads. • Keys for other milling heads must be ordered separately.
- MM GRT.. shanks serve mainly for MM GRIT.. slitting heads. • K-Type - For general steel machining. • P-Type - Positive geometry for soft and gummy materials.
- For user guide see pages 44, 177-184

(1) Cutting depth maximum
(2) Number of flutes
(3) Minimum bore diameter
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-22K/P,28K/P 4T8/6T10

Interchangeable Solid Carbide Small Diameter Groove Milling Heads



Designation	Dimensions DC	CW	CDX(1)	NOF(2)	RE	DMIN(3)	THSZMS			IC908
MM GRIT22K076-000-4T8	21.70	0.76	1.50	4	0.00	22.00	T08		T-25/3*	●
MM GRIT22K086-000-4T8	21.70	0.86	1.70	4	0.00	22.00	T08		T-25/3*	●
MM GRIT22K096-000-4T8	21.70	0.96	1.90	4	0.00	22.00	T08		T-25/3*	●
MM GRIT22K100-005-4T8	21.70	1.00	2.00	4	0.05	22.00	T08		T-25/3*	●
MM GRIT22P100-005-4T8	21.70	1.00	2.00	4	0.05	22.00	T08		T-25/3*	●
MM GRIT22K120-005-4T8	21.70	1.20	4.50	4	0.05	22.00	T08		T-25/3*	●
MM GRIT22K140-005-4T8	21.70	1.40	4.50	4	0.05	22.00	T08		T-25/3*	●
MM GRIT22K157-000-4T8	21.70	1.57	4.50	4	0.00	22.00	T08		T-25/3*	●
MM GRIT22K170-010-4T8	21.70	1.70	4.50	4	0.10	22.00	T08		T-25/3*	●
MM GRIT22P170-010-4T8	21.70	1.70	4.50	4	0.10	22.00	T08		T-25/3*	●
MM GRIT22K195-020-4T8	21.70	1.95	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K200-020-4T8	21.70	2.00	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22P200-020-4T8	21.70	2.00	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K225-020-4T8	21.70	2.25	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K239-020-4T8	21.70	2.39	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K250-020-4T8	21.70	2.50	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22P250-020-4T8	21.70	2.50	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K275-020-4T8	21.70	2.75	4.50	4	0.20	22.00	T08		T-25/3*	●
MM GRIT22K300-020-4T8	21.70	3.00	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22P300-020-4T8	21.70	3.00	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K317-020-4T8	21.70	3.17	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K325-020-4T8	21.70	3.25	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22P381-020-4T8	21.70	3.81	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K400-020-4T8	21.70	4.00	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22P400-020-4T8	21.70	4.00	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22P400-200-4T8	21.70	4.00	4.50	4	2.00	22.00	T08		T-30/3 L*	●
MM GRIT22K425-020-4T8	21.70	4.25	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K425-120-4T8	21.70	4.25	4.50	4	1.20	22.00	T08		T-30/3 L*	●
MM GRIT22K475-020-4T8	21.70	4.75	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K525-020-4T8	21.70	5.25	4.50	4	0.20	22.00	T08		T-30/3 L*	●
MM GRIT22K600-300-4T8	21.70	6.00	4.50	4	3.00	22.00	T08		T-30/3 L*	●
MM GRIT28K250-020-6T10	27.70	2.50	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28K525-020-6T10	27.70	5.25	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28P700-350-6T10	27.70	7.00	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28K1000-020-6T10	27.70	10.00	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28K1100-020-6T10	27.70	11.00	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28K1200-020-6T10	27.70	12.00	6.00	6	0.20	28.00	T10	T-40/3 L*		●
MM GRIT28K1300-020-6T10	27.70	13.00	6.00	6	0.20	28.00	T10	T-40/3 L*		●

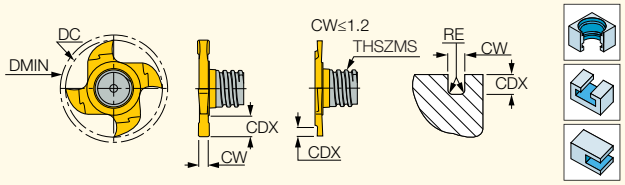
- Recommended for Orings and retaining rings • K - for general steel & cast iron machining P - for soft and gummy materials
- Modification options on request • Do not apply lubricant to the threaded connection • For clamping instructions, see pages 91-92
- For shanks, see pages 84-91 • Use carbide shanks for groove milling heads.
- Keys for other milling heads must be ordered separately.
- MM GRT.. shanks serve mainly for MM GRIT.. slitting heads. • K-Type - For general steel machining. • P-Type - Positive geometry for soft and gummy materials.
- For user guide see pages 44, 177-184

(1) Cutting depth maximum
(2) Number of flutes
(3) Minimum bore diameter
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM GRIT-22K/P,28K/P

Interchangeable Solid Carbide Small Diameter Groove Milling Heads



Designation	Dimensions								IC528
	DC	CW	CDX(2)	NOF(3)	RE	DMIN(4)	THSZMS	∠	
MM GRIT 22K-0.76-0.00 (1)	21.70	0.76	1.50	4	0.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-0.86-0.00 (1)	21.70	0.86	1.70	4	0.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-0.96-0.00 (1)	21.70	0.96	1.90	4	0.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.00-0.05	21.70	1.00	2.00	4	0.05	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-1.00-0.05	21.70	1.00	2.00	4	0.05	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.20-0.05 (1)	21.70	1.20	4.50	4	0.05	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.40-0.05 (1)	21.70	1.40	4.50	4	0.05	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.57-0.00	21.70	1.57	4.50	4	0.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.70-0.10 (1)	21.70	1.70	4.50	4	0.10	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-1.70-0.10 (1)	21.70	1.70	4.50	4	0.10	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-1.95-0.20 (1)	21.70	1.95	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-2.00-0.20	21.70	2.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-2.00-0.20	21.70	2.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-2.25-0.20 (1)	21.70	2.25	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-2.39-0.20	21.70	2.39	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-2.50-0.20	21.70	2.50	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-2.50-0.20	21.70	2.50	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-2.75-0.20 (1)	21.70	2.75	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-3.00-0.20	21.70	3.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-3.00-0.20	21.70	3.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-3.17-0.20	21.70	3.17	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-3.25-0.20 (1)	21.70	3.25	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-3.81-0.20	21.70	3.81	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-4.00-0.20	21.70	4.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-4.00-0.20	21.70	4.00	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22P-4.00-2.00	21.70	4.00	4.50	4	2.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-4.25-0.20 (1)	21.70	4.25	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-4.25-1.20 (1)	21.70	4.25	4.50	4	1.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-4.75-0.20	21.70	4.75	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-5.25-0.20 (1)	21.70	5.25	4.50	4	0.20	22.00	T08	MM EGR 20-22*	•
MM GRIT 22K-6.00-3.00	21.70	6.00	4.50	4	3.00	22.00	T08	MM EGR 20-22*	•
MM GRIT 28K-2.50-0.2	27.70	2.50	6.00	6	0.20	28.00	T10	T-40/3 L*	•
MM GRIT 28K-5.25-0.2	27.70	5.25	6.00	6	0.20	28.00	T10	T-40/3 L*	•
MM GRIT 28P-7.0-3.5	27.70	7.00	5.70	6	3.50	28.00	T10	T-40/3 L*	•
MM GRIT 28K-10.0-0.2	27.70	10.00	6.00	6	0.20	28.00	T10	T-40/3 L*	•

- Recommended for Orings and retaining rings • K - for general steel & cast iron machining P for soft and gummy materials
- Modification options on request • Do not apply lubricant to the threaded connection • For clamping instructions, see pages 91-92
- For user guide see pages 542-548 • For shanks, see pages 84-91 • Use carbide shanks for groove milling heads.
- Keys for other milling heads must be ordered separately.
- MM GRT.. shanks serve mainly for MM GRIT.. slitting heads. • K-Type - For general steel machining. • P-Type - Positive geometry for soft and gummy materials.
- For user guide see pages 44, 177-184

(1) For circle clips according to DIN471/472 and ANSI B27.7M
(2) Cutting depth maximum
(3) Number of flutes
(4) Minimum bore diameter
* Optional, should be ordered separately

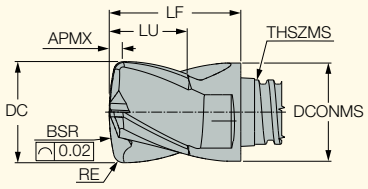
Machining Data for MULTI-MASTER Groove Milling Heads

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No.	MM-TS			MM-GRIT K-TYPE			MM-GRIT P-TYPE		
							Speed	Feed mm/t		Speed	Feed mm/t		Speed	Feed mm/t	
							V m/min	$F_{z\ (min)}$	$F_{z\ (max)}$	V m/min	$F_{z\ (min)}$	$F_{z\ (max)}$	V m/min	$F_{z\ (min)}$	$F_{z\ (max)}$
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1	110-140	0.08	0.20	110-160	0.05	0.15	-	-	-
		>= 0.25 %C	Annealed	650	190	2	100-120	0.08	0.18	100-150	0.05	0.15	-	-	-
		< 0.55 %C	Quenched and tempered	850	250	3	70-100	0.08	0.15	80-100	0.05	0.15	-	-	-
		>= 0.55 %C	Annealed	750	220	4	70-100	0.08	0.15	80-100	0.05	0.15	-	-	-
			Quenched and tempered	1000	300	5	60-80	0.08	0.15	60-80	0.05	0.15	-	-	-
	Low alloy and cast steel (less than 5% of alloying elements)		Annealed	600	200	6	100-120	0.08	0.15	110-150	0.05	0.15	-	-	-
			Quenched and tempered	930	275	7	90-120	0.08	0.15	100-120	0.05	0.15	-	-	-
				1000	300	8	80-110	0.08	0.15	70-110	0.05	0.15	-	-	-
				1200	350	9	70-100	0.05	0.12	70-100	0.05	0.15	-	-	-
	High alloyed steel, cast steel and tool steel		Annealed	680	200	10	60-80	0.05	0.18	60-80	0.05	0.15	-	-	-
			Quenched and tempered	1100	325	11	55-70	0.08	0.15	55-70	0.05	0.15	-	-	-
	Stainless steel and cast steel		Ferritic/ martensitic.	680	200	12	100-130	0.06	0.12	100-130	0.03	0.15	100-130	0.03	0.10
			Martensitic	820	240	13	100-120	0.08	0.15	100-130	0.03	0.15	100-130	0.03	0.10
M	Stainless steel and cast steel		Austenitic	600	180	14	80-120	0.05	0.10	90-120	0.03	0.12	90-120	0.03	0.10
K	Grey cast iron (GG)		Ferritic/ pearlitic		180	15	160-220	0.10	0.20	160-220	0.03	0.12	-	-	-
			Pearlitic / martensitic		260	16	120-200	0.10	0.15	120-200	0.03	0.12	-	-	-
	Cast iron nodular (GGG)		Ferritic		160	17	100-140	0.10	0.20	-	-	-	-	-	-
			Pearlitic		250	18	80-100	0.10	0.15	-	-	-	-	-	-
	Malleable cast iron		Ferritic		130	19	180-250	0.10	0.20	180-250	0.03	0.15	-	-	-
			Pearlitic		230	20	160-220	0.10	0.15	160-220	0.03	0.15	-	-	-
N	Aluminum-wrought alloys		Not cureable		60	21	800-1200	0.10	0.20	-	-	-	800-1200	0.05	0.15
			Cured		100	22	800-1200	0.10	0.20	-	-	-	800-1200	0.05	0.15
	Aluminum-cast-alloys	<=12% Si	Not cureable		75	23	-	-	-	-	-	-	600-1000	0.05	0.15
			Cured		90	24	-	-	-	-	-	-	500-1000	0.05	0.15
		>12% Si	High temperature		130	25	-	-	-	-	-	-	200-400	0.05	0.15
	Copper alloys	>1% Pb	Free cutting		110	26	-	-	-	-	-	-	-	-	-
			Brass		90	27	-	-	-	-	-	-	-	-	-
			Electrolitic copper		100	28	-	-	-	-	-	-	-	-	-
	Non-metallic		Duroplastics, fiber plastics			29	-	-	-	-	-	-	-	-	-
			Hard rubber			30	-	-	-	-	-	-	-	-	-
S	High temp. alloys	Fe based	Annealed		200	31	-	-	-	30-40	0.02	0.12	-	-	-
			Cured		280	32	25-35	0.05	0.12	25-40	0.02	0.12	-	-	-
		Ni or Co based	Annealed		250	33	25-35	0.05	0.12	25-40	-	-	-	0.01	0.12
			Cured		350	34	25-35	0.05	0.12	25-40	-	-	-	0.01	0.12
			Cast		320	35	40-60	0.05	0.12	25-40	-	-	-	0.01	0.12
	Titanium Ti alloys			RM 400		36	40-60	0.05	0.12	40-60	-	-	-	0.05	0.12
			Alpha+beta alloys cured	RM 1050		37	40-60	0.05	0.10	40-60	-	-	-	0.05	0.10
H	Hardened steel		Hardened		55 HRC	38									
			Hardened		60 HRC	39									
	Chilled cast iron		Cast		400	40									
	Cast iron		Hardened		55 HRC	41									

MULTI-MASTER INDEXABLE SOLID CARBIDE LINE
NEOBARREL PROFILE MILLING

MM ELB

Interchangeable Lens-Shaped (Barrel) Solid Carbide Heads for 3D Profiling



Designation	Dimensions									IC908
	DC	BSR	RE	LU	APMX	THSZMS	DCONMS	NOF(1)	LF	
MM ELB08R16A05-4T05	8.00	16.00	0.50	5.50	0.90	T05	8.00	4	10.00	•
MM ELB10R20A07-4T06	10.00	20.00	1.00	7.50	1.42	T06	10.00	4	13.00	•
MM ELB12R24A09-4T08	12.00	24.00	1.00	9.00	1.55	T08	12.00	4	16.50	•
MM ELB16R32A12-4T10	16.00	32.00	1.00	12.00	1.80	T10	16.00	4	20.50	•

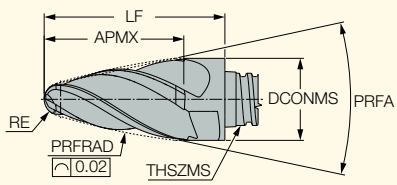
• For user guide see pages 44, 177-184

(1) Number of flutes

MULTI-MASTER INDEXABLE SOLID CARBIDE LINE
NEOBARREL PROFILE MILLING

MM EOB

Interchangeable Oval-Shaped (Barrel) Solid Carbide Heads for 3D Profiling



Designation	Dimensions								IC908
	PRFRAD	RE	APMX	PRFA	THSZMS	NOF(1)	DCONMS	LF	
MM EOB08R1.5R80A13-4T05	80.00	1.50	14.20	24.00	T05	4	8.00	18.00	•
MM EOB12R2.0R75A21-4T08	75.00	2.00	21.30	24.00	T08	4	12.00	27.00	•
MM EOB10R2.0R85A16-4T06	85.00	2.00	16.50	24.00	T06	4	10.00	22.00	•
MM EOB16R3.0R75A26-4T10	75.00	3.00	27.00	24.00	T10	4	16.00	33.40	•

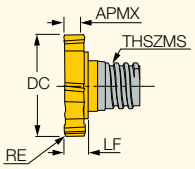
• For user guide see pages 44, 177-184

(1) Number of flutes

MULTI-MASTER INDEXABLE SOLID CARBIDE LINE

MM FM

Interchangeable Solid Carbide Face Milling Heads with MULTI-MASTER Threaded Connections



Designation	Dimensions							IC908	Recommended Machining Data
	DC	APMX	RE	NOF(1)	THSZMS	LF			f_z (mm/t)
MM FM120-36R0.2-06T05	12.00	3.60	0.20	6	T05	4.40	T-20/3*	•	0.04-0.10
MM FM160-48R0.4-06T06	16.00	4.80	0.40	6	T06	5.60	T-25/3*	•	0.05-0.10
MM FM200-60R0.4-06T08	20.00	6.00	0.40	6	T08	6.80	T-40/3 L*	•	0.05-0.10
MM FM250-75R0.4-06T10	25.00	7.50	0.40	6	T10	8.40	T-50/3 L*	•	0.05-0.10

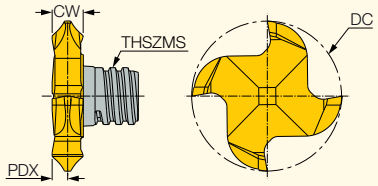
(1) Number of flutes

* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM SS

Interchangeable Solid Carbide Heads for Milling Involute Spline Shafts According to DIN 5480



Designation	Dimensions								IC528
	Module	T range[1]	DC	PDX	CW	NOF[2]	THSZMS		
MM SS22M100Z1720-4T08	1.00	17-20	21.70	2.8	5.50	4	T08	MM EGR 20-22*	●
MM SS22M100Z2125-4T08	1.00	21-25	21.70	2.3	4.50	4	T08	MM EGR 20-22*	●
MM SS22M150Z1720-4T08	1.50	17-20	21.70	2.7	5.40	4	T08	MM EGR 20-22*	●

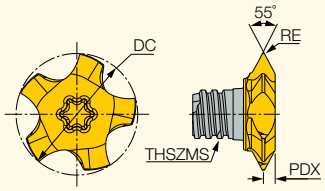
• MM EGR 20-22 clamping keys are supplied with each MM GRT... shanks • Tightening torque 1500 Nxcm • Do not apply lubricant to the threaded connection.
• For clamping instructions, see pages 91-92 • For user guide see pages 44, 177-184 • For shanks, see pages 84-91

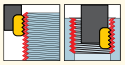
(1) Teeth range
(2) Number of flutes
* Optional, should be ordered separately

SOLIDTHREAD
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRF 55°

Interchangeable Solid Carbide Milling Heads for 55° Partial Profile Thread Milling





Designation	Dimensions											IC908
	DC	NOF[1]	TPIN[2]	TPIX[3]	RE	PDX	THSZMS	TDZ[4]	DMIN	TQ[5]	Standard	
MM TRF12-W55-P11-5T05	11.94	5	11.00	14.00	0.23	1.15	T05	15.875	13.60	7.0	DIN/ISO 228, B.S. 84	●
MM TRF12-W55-P19-5T05	11.94	5	19.00	28.00	0.11	0.75	T05	14.287	13.10	10.0	DIN/ISO 228, B.S. 84	●
MM TRF16-W55-P8-5T06	15.94	5	8.00	14.00	0.23	1.55	T06	20.637	18.30	15.0	DIN/ISO 228, B.S. 84	●
MM TRF20-W55-P6-6T08	19.94	6	6.00	8.00	0.40	1.95	T08	25.4	21.30	28.0	DIN/ISO 228, B.S. 84	●

• For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983) • For shanks, see pages 84-91 • For clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection.

(1) Number of flutes
(2) Threads per inch minimum
(3) Threads per inch maximum
(4) Smallest possible thread
(5) Tightening torque

Spare Parts

Designation	
MM TRF12-W55-P11-5T05	BIT SOCKET T20 3/8" DRIVE*
MM TRF12-W55-P19-5T05	BIT SOCKET T20 3/8" DRIVE*
MM TRF16-W55-P8-5T06	BIT SOCKET T25 3/8" DRIVE*
MM TRF20-W55-P6-6T08	BIT SOCKET T40 3/8" DRIVE*

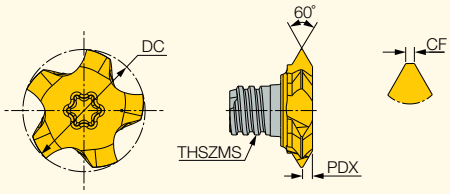
* Optional, should be ordered separately

SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRF 60°

Interchangeable Solid Carbide Milling Heads for 60° Partial Profile Thread Milling



Designation	Dimensions											
	DC	NOF(1)	TTP	TTP_DF2	TPN(2)	TPX(3)	TPN_DF2	TPX_DF2	TPIN(4)	TPIX(5)	TPIN_DF2	TPIX_DF2
MM TRF12A60-P080-5T05	11.94	5	INT	EXT	0.500	0.800	0.400	0.800	28.00	56.00	32.00	64.00
MM TRF12A60-P175-5T05	11.94	5	INT	EXT	1.000	1.750	0.800	1.500	14.00	28.00	16.00	32.00
MM TRF12A60-P250-5T05	11.94	5	INT	EXT	2.000	2.500	1.750	2.000	10.00	13.00	11.00	15.00
MM TRF16A60-P080-5T06	15.94	5	INT	EXT	0.500	0.800	0.400	0.800	28.00	56.00	32.00	64.00
MM TRF16A60-P175-5T06	15.94	5	INT	EXT	1.000	1.750	0.800	1.500	14.00	28.00	16.00	32.00
MM TRF16A60-P300-5T06	15.94	5	INT	EXT	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00
MM TRF20A60-P200-6T08	19.94	6	INT	EXT	1.000	2.000	0.800	1.750	13.00	28.00	15.00	32.00
MM TRF20A60-P300-6T08	19.94	6	INT	EXT	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00
MM TRF20A60-P400-6T08	19.94	6	INT	EXT	3.000	4.000	2.500	3.500	6.00	9.00	7.00	10.00
MM TRF28A60-P600-5T10	27.70	5	INT	EXT	5.000	6.000	4.500	5.000	4.00	5.00	5.00	6.00
MM TRF28A60-P500-6T10	27.70	6	INT	EXT	3.000	5.000	2.500	4.500	6.00	8.00	6.00	10.00

Designation	CF	PDX	THSZMS	TDZ(6)	TQ	DMIN	Standard	IC908
MM TRF12A60-P080-5T05	0.05	0.55	T05	M14	7.0	13.50	ISO 68, DIN 13	●
MM TRF12A60-P175-5T05	0.11	0.96	T05	M14	7.0	13.00	ISO 68, DIN 13	●
MM TRF12A60-P250-5T05	0.22	1.21	T05	M16	7.0	14.00	ISO 68, DIN 13	●
MM TRF16A60-P080-5T06	0.05	0.55	T06	M18	10.0	17.50	ISO 68, DIN 13	●
MM TRF16A60-P175-5T06	0.10	1.00	T06	M18	10.0	17.00	ISO 68, DIN 13	●
MM TRF16A60-P300-5T06	0.22	1.41	T06	M20	10.0	18.00	ISO 68, DIN 13	●
MM TRF20A60-P200-6T08	0.11	0.95	T08	M24	10.0	23.00	ISO 68, DIN 13	●
MM TRF20A60-P300-6T08	0.22	1.41	T08	M24	15.0	22.00	ISO 68, DIN 13	●
MM TRF20A60-P400-6T08	0.31	1.86	T08	M25	15.0	22.00	ISO 68, DIN 13	●
MM TRF28A60-P600-5T10	0.57	2.49	T10	M38	28.0	33.00	ISO 68, DIN 13	●
MM TRF28A60-P500-6T10	0.34	2.17	T10	M33	28.0	30.00	ISO 68, DIN 13	●

• For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983) • For shanks, see pages 84-91 • For clamping instructions, see pages 91-92

• Do not apply lubricant to the threaded connection.

(1) Number of flutes

(2) Thread pitch minimum (mm)-internal

(3) Thread pitch maximum (mm)-internal

(4) Thread pitch minimum (mm)-external

(5) Thread pitch maximum (mm)-external

(6) Threads per inch minimum-internal

Spare Parts

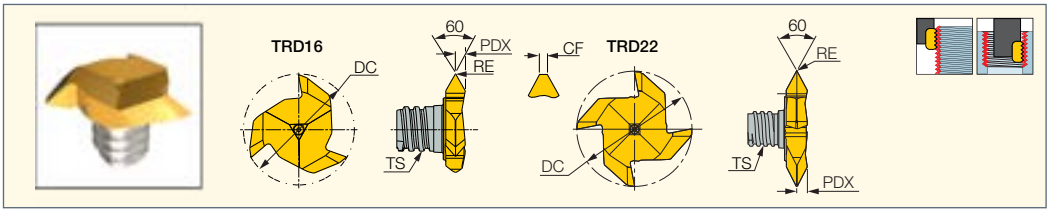
Designation	
MM TRF12A60-P080-5T05	BIT SOCKET T20 3/8" DRIVE*
MM TRF12A60-P175-5T05	BIT SOCKET T20 3/8" DRIVE*
MM TRF12A60-P250-5T05	BIT SOCKET T20 3/8" DRIVE*
MM TRF16A60-P080-5T06	BIT SOCKET T20 3/8" DRIVE*
MM TRF16A60-P175-5T06	BIT SOCKET T25 3/8" DRIVE*
MM TRF16A60-P300-5T06	BIT SOCKET T25 3/8" DRIVE*
MM TRF20A60-P200-6T08	BIT SOCKET T25 3/8" DRIVE*
MM TRF20A60-P300-6T08	BIT SOCKET T40 3/8" DRIVE*
MM TRF20A60-P400-6T08	BIT SOCKET T25 3/8" DRIVE*
MM TRF28A60-P600-5T10	BIT SOCKET T40 3/8" DRIVE*
MM TRF28A60-P500-6T10	BIT SOCKET T40 3/8" DRIVE*

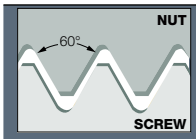
* Optional, should be ordered separately

SOLIDTHREAD
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRD-M

Interchangeable Solid Carbide Milling Heads for 60° Partial Profile Thread Milling





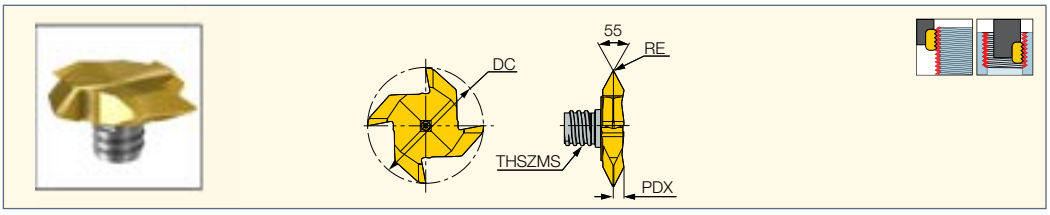
Designation	Dimensions DC	NOF(1)	TPN(2)	TPX(3)	RE	CF	PDX	THSZMS	TDZ(4)	DMIN	Standard		IC528
MM TRD16-M60-05P-3T06	15.70	3	0.500	2.000	- (5)	0.05	1.4	T06	M20	19.05	ISO 68, DIN 13	MM EGR 16-18*	●
MM TRD16-M60-15P-3T06	15.70	3	1.500	2.000	0.05	-	1.4	T06	M22	19.05	ISO 68, DIN 13	MM EGR 16-18*	●
MM TRD22-M60-30P-4T08	21.70	4	3.000	4.500	0.20	-	2.4	T08	M36	31.00	ISO 68, DIN 13	MM EGR 20-22*	●

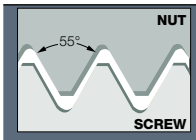
• For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983) • For shanks, see pages 84-91 • For clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection.
(1) Number of flutes
(2) Thread pitch minimum (mm)-internal
(3) Thread pitch maximum (mm)-internal
(4) Thread pitch minimum (mm)-external
* Optional, should be ordered separately

SOLIDTHREAD
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRD-W

Interchangeable Solid Carbide Milling Heads for 55° Partial Profile Thread Milling





Designation	Dimensions DC	NOF(1)	RE	PDX	TPIN(2)	TPIX(3)	THSZMS	TDZ(4)	DMIN	Standard		IC528
MM TRD22-W55-14P-4T08	21.70	4	0.20	2.0	11.00	14.00	T08	G3/4	24.20	DIN ISO 228, B.S. 84	MM EGR 20-22*	●

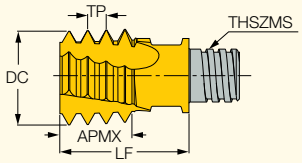
• For shanks, see pages 84-91 • For clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection.
(1) Number of flutes
(2) Threads per inch minimum-internal
(3) Threads per inch maximum-internal
(4) Threads per inch minimum-external
* Optional, should be ordered separately

SOLIDTHREAD

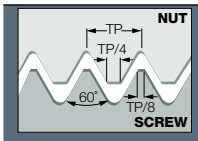
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MT-ISO-MM

Carbide Milling Heads with a Threaded Connection for Internal ISO Metric Thread



Application: General engineering



Designation	Dimensions TP[1]	M Coarse	M Fine	DC	NOF[2]	APMX	LF	THSZMS				IC908
MT10D7.5 0.5ISO-MMT05	0.500	-	=>14	10.00	4	7.50	12.75	T05	MM KEY 6X4*			•
MT 10D6 0.75ISO-MMT05	0.750	-	=>12	10.00	4	6.00	12.75	T05	MM KEY 6X4*			•
MT 10D6 1.0ISO-MMT05	1.000	-	=>12	10.00	4	6.00	12.75	T05	MM KEY 6X4*			•
MT 10D5 1.25ISO-MMT05	1.250	-	=>14	10.00	4	5.00	12.75	T05	MM KEY 6X4*			•
MT 10D6 1.5ISO-MMT05	1.500	-	=>14	10.00	4	6.00	12.75	T05	MM KEY 6X4*			•
MT 12D8 0.5ISO-MMT06	0.500	-	=>16	12.00	4	8.00	14.30	T06	MM KEY 8X5*			•
MT 12E8 0.75ISO-MMT06	0.750	-	=>16	12.00	5	8.30	14.30	T06	MM KEY 8X5*			•
MT 12E8 1.0ISO-MMT06	1.000	-	=>16	12.00	5	8.00	14.30	T06	MM KEY 8X5*			•
MT 12D8 1.25ISO-MMT06	1.250	-	=>16	12.00	4	7.50	14.30	T06	MM KEY 8X5*			•
MT 12D7 1.5ISO-MMT06	1.500	-	=>16	12.00	4	7.60	14.30	T06	MM KEY 8X5*			•
MT 12D7 1.75ISO-MMT06	1.750	-	=>16	12.00	4	7.10	14.30	T06	MM KEY 8X5*			•
MT12D8 2.0ISO-MMT06	2.000	M16	=>17	12.00	4	8.00	14.30	T06	MM KEY 8X5*			•
MT 16F12 1.0ISO-MMT08	1.000	-	=>22	16.00	6	12.00	20.00	T08	MM KEY 10X7*			•
MT 16F12 1.5ISO-MMT08	1.500	-	=>20	16.00	6	12.00	20.00	T08	MM KEY 10X7*			•
MT 16E12 2.0ISO-MMT08	2.000	-	=>19	16.00	5	12.00	20.00	T08	MM KEY 10X7*			•
MT15.4E13 2.5ISO-MMT08 98	2.500	M20	=>22	15.40	5	12.70	20.00	T08	MM KEY 10X7*			•
MT 16C12 3.0ISO-MMT08	3.000	M24	=>25	16.00	3	12.10	20.00	T08	MM KEY 10X7*			•
MT20F14 2.0ISO-MMTT10	2.000	-	=>27	20.00	6	12.00	21.00	T10		BIT SOCKET T30 3/8" DRIVE*	T-40/3 L*	•
MT20D12 3.0ISO-MMTT10	3.000	-	=>27	20.00	4	12.20	21.00	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	•
MT20D14 3.5ISO-MMTT10	3.500	-	=>30	20.00	4	10.60	21.00	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	•

• Note: Description and dimensions relate to the new products with clamping flats.
There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted.

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92

• Do not apply lubricant to the threaded connection

(1) Thread pitch

(2) Number of flutes

* Optional, should be ordered separately

Identification Code

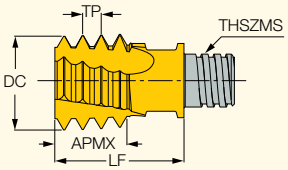
MT	10	D	6	0.75	ISO	MMT/MMTT
MULTI-MASTER Thread Mill	Cutting Dia.	No. of Flutes	Cutting Length	Pitch	Thread Profile ISO UN G (55°)	Connection Size

SOLIDTHREAD

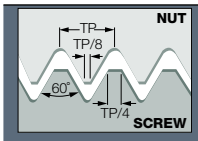
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MT-UN-MM

Carbide Milling Heads with a Threaded Connection for Internal UN Thread Profile



Application: General engineering



Designation	TPI[1]	UNC	UNF	UNEF	DC	NOF[2]	APMX	LF	THSZMS	TP[3]	IC908
	Dimensions										
MT 10D7 32UN-MMT05	32.0	-	-	-	10.00	4	6.40	12.75	T05	0.794	•
MT 10D6 28UN-MMT05	28.0	-	1/2	-	10.00	4	5.50	12.75	T05	0.907	•
MT 10D6 24UN-MMT05	24.0	-	-	9/16-5/8	10.00	4	5.30	12.75	T05	1.058	•
MT 10D6 20UN-MMT05	20.0	-	1/2	-	10.00	4	5.10	12.75	T05	1.270	•
MT 10D5 18UN-MMT05	18.0	-	9/16-5/8	1 1/8-1 5/8	10.00	4	5.60	12.75	T05	1.411	•
MT 10D7 16UN-MMT05	16.0	-	3/4	-	10.00	4	6.40	12.75	T05	1.588	•
MT 12D8 24UN-MMT06	24.0	-	-	5/8- 11/16	12.00	4	7.40	14.30	T06	1.058	•
MT 12D8 20UN-MMT06	20.0	-	-	3/4 - 1	12.00	4	7.70	14.30	T06	1.270	•
MT 12D8 18UN-MMT06	18.0	-	5/8	=>1 11/16	12.00	4	7.10	14.30	T06	1.411	•
MT 12D8 16UN-MMT06	16.0	-	3/4	-	12.00	4	8.00	14.30	T06	1.588	•
MT 12D8 14UN-MMT06	14.0	-	7/8	-	12.00	4	7.30	14.30	T06	1.814	•
MT 16E11 18UN-MMT08	18.0	-	5/8	=>1 11/16	16.00	5	11.30	20.00	T08	1.411	•
MT 16E13 14UN-MMT08	14.0	-	7/8	-	16.00	5	12.70	20.00	T08	1.814	•
MT 16E13 12UN-MMT08	12.0	-	1-1 1/2	-	16.00	5	12.70	20.00	T08	2.117	•
MT 15.3D13 10UN-MMT08	10.0	3/4	-	-	15.30	4	12.70	20.00	T08	2.540	•
MT 16C11 9UN-MMT08	9.0	7/8	-	-	16.00	3	11.30	20.00	T08	2.822	•
MT 16C13 8UN-MMT08	8.0	1.0	-	-	16.00	3	12.70	20.00	T08	3.175	•
MT20F13 12UN-MMTT10	12.0	-	=>1	-	20.00	6	12.70	21.00	T10	2.117	•
MT20D13 8UN-MMTT10	8.0	1		-	20.00	4	12.70	21.00	T10	3.175	•
MT20D15 7UN-MMTT10	7.0	-	1 1/8 - 1 1/4	-	20.00	4	10.90	21.00	T10	3.629	•

- Note: Description and dimensions relate to the new products with clamping flats.

There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted.

- For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection

(1) Threads per inch

(2) Number of flutes

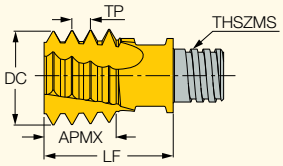
(3) Thread pitch

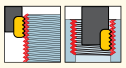
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

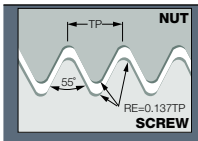
MT-W-MM

Carbide Milling Heads with a Threaded Connection for Internal and External 55° BSW Thread Profile





Application: General engineering fittings and pipe couplings



Designation	Dimensions TPI[1]	TDZ	DC	NOF[2]	APMX	LF	THSZMS	TP[3]	IC908
MT 10D6 19W-MMT05	19.0	G1/4-3/8	10.00	4	5.30	12.75	T05	1.337	●
MT 16D13 14W-MMT08	14.0	G1/2-7/8	16.00	4	12.70	20.00	T08	1.814	●
MT 16D11 11W-MMT08	11.0	G=>1	16.00	4	11.50	20.00	T08	2.309	●
MT20F15 14W-MMTT10	14.0	G3/4-7/8	20.00	6	12.70	21.00	T10	1.814	●
MT20F14 11W-MMTT10	11.0	G=>1	20.00	6	11.50	21.00	T10	2.309	●

• Note: Description and dimensions relate to the new products with clamping flats.
There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted.
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection
(1) Threads per inch
(2) Number of flutes
(3) Thread pitch

Thread Size	Key [1]	Torque Wrench [1]	Wrench [1]	Tightening Torque (Nxcm)
T05	MM KEY 6x4	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 6-05	700
T06	MM KEY 8x5	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 8-06	1000
T08	MM KEY 10x7	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 10-08	1500
T10	MM KEY 13x8	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 13-10	2800

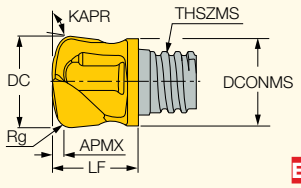
(1) Order separately

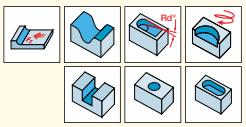
MULTI FEED MASTER

SOLID FEED MILL

MM FF

Interchangeable 2 Flute FEEDMILL Solid Carbide Heads for Milling at Very Fast Feeds and Small D.O.C.





ECONOMICAL SOLUTION

Designation	Dimensions DC	NOF[1]	APMX	Rg[2]	THSZMS	DCONMS	LF	KAPR[3]	RMPX°[4]	Tough ↔ Hard IC908	IC903	Recommended Machining Data f_z (mm/t)
MM FF100R1.5-L12-2T06	10.00	2	0.60	2.00	T06	9.60	12.50	97.0	7.0	●		0.30-0.60
MM FF120R2.0-2T08	12.00	2	0.68	2.50	T08	11.50	11.10	97.0	7.0	●	●	0.50-1.00
MM FF500R08-L59-2T08	12.70	2	0.68	2.50	T08	11.50	15.00	95.0	7.0	●		0.50-1.00
MM FF160R2.0-2T10	16.00	2	1.10	3.00	T10	15.20	13.50	97.0	7.0	●		0.55-1.10
MM FF200R2.0-2T12	20.00	2	1.50	3.40	T12	18.45	17.40	95.0	7.0	●		0.75-1.50

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Radius for programming
(3) Tool cutting edge angle
(4) Maximum ramping angle

Machining Example:

Shank: MM S-B-L140-C16-T08
Milling head: MM FF 120R2.0-2T08
Workpiece material: SAE 4340 HRc 28

Plunging
a_p = 2 mm
V_c = 80 mm
F = 0.24 m/min

Milling
a_p = 0.7 mm
a_e = 8 mm
V_c = 150 m/min
F_z = 1 mm/tooth
V_f = 7960 mm/min

Machining Example:

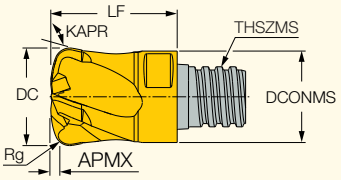
Shank: MM S-A-L070-W20-T10
Milling head: MM FF160R2.0-2T10 908
Workpiece material: P20 HRc 52

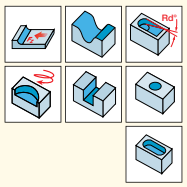
Milling
a_p = 0.2 mm
a_e = 6 mm
V_c = 150 m/min
F_z = 1.4 mm/tooth
V_f = 8355
T = 60 min

MULTIFEED MASTER
SOLIDFEED MILL

MM EFF

4, 6 Flute Solid Carbide Heads for Milling at Very Fast Feeds and Small D.O.C.





Designation	Dimensions DC	NOF[3]	APMX	THSZMS	DCONMS	LF	RMPX°[4]	KAPR[5]	Rg[6]	CSP[7]	Tough ↔ Hard IC908	IC903	Recommended Machining Data f_z (mm/t)
MM EFF080T3R1.62-4T05	8.00	4	0.40	T05	7.50	10.00	5.0	97.0	1.62	0		•	0.12-0.48
MM EFF100T4R2.01-4T06	10.00	4	0.50	T06	9.50	13.00	5.0	97.0	2.01	0		•	0.16-0.57
MM EFF100T2R1.0-6T06H [1]	10.00	6	0.45	T06	9.50	10.00	3.0	97.0	1.00	1		•	0.16-0.47
MM EFF120T4R1.8-4T08H [1]	12.00	4	0.60	T08	11.50	16.50	5.0	97.0	1.80	1	•		0.16-0.67
MM EFF120T4R2.47-4T08	12.00	4	0.60	T08	11.50	16.50	5.0	97.0	2.47	0		•	0.16-0.67
MM EFF120T2R1.2-6T08H [1]	12.00	6	0.65	T08	11.50	12.50	3.0	97.0	1.20	1		•	0.16-0.54
MM EFF127T4R2.59-4T08	12.70	4	0.60	T08	12.20	16.50	5.0	97.0	2.59	0		•	0.16-0.67
MM EFF127T4R1.3-6T08H	12.70	6	0.70	T08	12.20	12.70	3.0	97.0	1.30	1		•	0.16-0.67
MM EFF160T5R2.2-4T10H [1]	16.00	4	0.80	T10	15.40	20.50	5.0	97.0	2.20	1	•		0.20-0.75
MM EFF160T5R3.25-4T10	16.00	4	0.80	T10	15.40	20.50	5.0	97.0	3.25	0		•	0.20-0.75
MM EFF160T4R2.0-6T10H [1]	16.00	6	1.05	T10	15.40	16.00	3.0	97.0	2.00	1		•	0.20-0.65
MM EFF200T6R4.02-4T12	20.00	4	1.00	T12	18.45	25.50	5.0	97.0	4.02	0		•	0.20-0.90
MM EFF200T5R2.2-6T12H [1]	20.00	6	1.25	T12	18.45	20.00	3.0	97.0	2.20	1		•	0.20-0.80
MM EFF250A7R3.1-6T15 [2]	25.00	6	1.20	T15	23.90	25.00	5.0	97.0	3.10	0		•	0.25-1.00
MM EFF254A7R3.1-6T15 [2]	25.40	6	1.20	T15	23.90	25.00	5.0	97.0	3.10	0		•	0.25-1.00

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

[1] With a central coolant hole
[2] Cannot be used for plunging application
[3] Number of flutes
[4] Maximum ramping angle
[5] Tool cutting edge angle
[6] Radius for programming
[7] 0 - Without coolant supply, 1 - With coolant supply

Machining Recommendations

VDI 3323	Material Group[1]	V_c (m/min)	a_p	AE	F_z (mm/t) vs. Tool Diameter (mm) 8	10	12	16	20	25
P	1	180	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	2	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	3	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	4	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	5	150	0.045xD	0.7xD	0.43	0.50	0.57	0.65	0.75	0.87
	6	150	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	7	140	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	8	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	9	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	10	130	0.04xD	0.6xD	0.28	0.33	0.38	0.48	0.57	0.67
	11	120	0.04xD	0.6xD	0.25	0.30	0.35	0.43	0.52	0.62
	12, 13	120	0.04xD	0.6xD	0.30	0.35	0.43	0.52	0.60	0.70
K	15-16	180	Apmax	0.7xD	0.45	0.52	0.60	0.70	0.80	0.90
	17-18	160	Apmax	0.7xD	0.38	0.45	0.52	0.60	0.70	0.80
H	38.1[2]	100	0.035xD	0.45xD	0.20	0.25	0.33	0.40	0.48	0.55
	38.2[3]	80	0.03xD	0.3xD	0.16	0.22	0.30	0.38	0.45	0.52
	39[4]	60	0.02xD	0.25xD	0.12	0.16	0.16	0.20	0.20	0.25

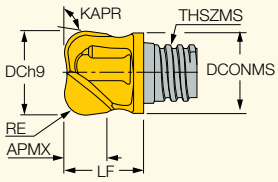
[1] ISCAR material group in accordance with VDI 3323 standard
[2] 45-49 HRc
[3] 50-55 HRc
[4] 56-63 HRc

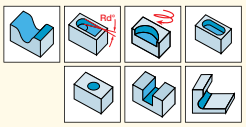
a_p - Depth of cut
AE - Width of cut

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HT

Torodial 2 Flute Interchangeable Solid Carbide Milling Heads





ECONOMICAL SOLUTION

Designation	Dimensions									Tough ↔ Hard	
	DC	NOF(1)	APMX	RE	Tm(2)	THSZMS	DCONMS	LF	KAPR(3)	IC908	IC903
MM HT100C08R0.5-2T06	10.00	2	7.00	0.50	r0-1.0	T06	9.50	12.45	95.0	•	
MM HT100C08R1.0-2T06	10.00	2	7.00	1.00	r0-1.0	T06	9.50	12.45	95.0	•	
MM HT100N06R2.0-2T06	10.00	2	6.00	2.00	r0-3.0	T06	9.50	12.40	97.0	•	
MM HT100N07R0.5-2T06	10.00	2	6.90	0.50	r0-1.0	T06	9.50	11.20	95.0		•
MM HT100N07R1.0-2T06	10.00	2	6.90	1.00	r0-1.0	T06	9.50	11.20	95.0		•
MM HT100N07R2.0-2T06	10.00	2	6.90	2.00	r0-3.0	T06	9.50	11.20	95.0		•
MM HT100N07R3.0-2T06	10.00	2	6.90	3.00	r2.7-4.0	T06	9.50	11.20	95.0		•
MM HT120N06R3.0-2T06	12.00	2	5.40	3.00	r2.7-4.0	T06	9.10	9.10	97.0	•	
MM HT120N06R4.0-2T06	12.00	2	5.10	4.00	r2.7-4.0	T06	11.50	9.10	97.0	•	
MM HT120N06R1.6-2T08	12.00	2	5.70	1.60	r1.3-r2.7	T08	11.50	11.10	97.0	•	•
MM HT120N06R2.0-2T08	12.00	2	5.90	2.00	r1.3-2.7	T08	11.50	11.10	97.0	•	•
MM HT120N06R2.5-2T08	12.00	2	5.50	2.50	r1.3-4.0	T08	11.50	11.10	97.0	•	
MM HT120N06R3.0-2T08	12.00	2	5.50	3.00	r2.7-4.4	T08	11.50	11.10	97.0	•	•
MM HT120N06R4.0-2T08	12.00	2	5.60	4.00	r2.7-4.4	T08	11.50	11.10	97.0	•	
MM HT160N07R2.0-2T10	16.00	2	6.90	2.00	r1.5-4.0	T10	15.20	13.10	97.0	•	
MM HT160N07R3.0-2T10	16.00	2	7.20	3.00	r1.5-4.0	T10	15.20	13.40	97.0	•	
MM HT160N07R4.0-2T10	16.00	2	7.10	4.00	r1.5-4.0	T10	15.20	13.40	97.0	•	
MM HT160N08R5.0-2T10	16.00	2	8.00	5.00	r2.7-4.4	T10	15.20	20.20	97.0	•	•
MM HT200N11R3.0-2T12	20.00	2	10.80	3.00	r3.0-8.0	T12	18.45	17.00	97.0	•	
MM HT200N11R4.0-2T12	20.00	2	11.10	4.00	r3.0-8.0	T12	18.45	17.30	97.0	•	
MM HT200N11R5.0-2T12	20.00	2	11.10	5.00	r3.0-8.0	T12	18.45	17.30	97.0	•	
MM HT200N11R6.0-2T12	20.00	2	11.00	6.00	r3.0-8.0	T12	18.45	17.30	97.0	•	
MM HT200N11R8.0-2T12	20.00	2	10.90	8.00	r3.0-8.0	T12	18.45	17.30	97.0	•	

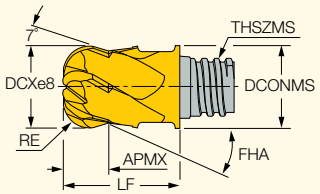
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

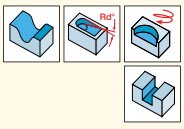
(1) Number of flutes
(2) Specially tailored radius range upon request
(3) Tool cutting edge angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ETR

Torodial 2 Flute Interchangeable Solid Carbide Milling Heads





Designation	Dimensions									Tough ↔ Hard	
	DCX(1)	NOF(2)	APMX	RE	THSZMS	DCONMS	LF	FHA	RMPX°(3)	IC908	IC903
MM ETR080A04R2.0-6T05	8.00	6	5.00	2.00	T05	7.70	10.00	30.0	9.0	•	
MM ETR080A4R05CF-6T05	8.00	6	4.00	0.50	T05	7.70	10.00	30.0	9.0		•
MM ETR080A4R10CF-6T05	8.00	6	4.00	1.00	T05	7.70	10.00	30.0	9.0		•
MM ETR100A05R3.0-6T06	10.00	6	7.00	3.00	T06	9.60	13.00	30.0	9.0	•	
MM ETR100A5R05CF-6T06	10.00	6	5.00	0.50	T06	9.60	13.00	30.0	9.0		•
MM ETR100A5R10CF-6T06	10.00	6	5.00	1.00	T06	9.60	13.00	30.0	9.0		•
MM ETR120A07R4.0-6T08	12.00	6	9.00	4.00	T08	11.70	16.50	30.0	9.0	•	
MM ETR120A7R05CF-6T08	12.00	6	7.00	0.50	T08	12.00	17.00	30.0	9.0		•
MM ETR120A7R10CF-6T08	12.00	6	7.00	1.00	T08	12.00	17.00	30.0	9.0		•
MM ETR160A09R5.0-6T10	16.00	6	12.00	5.00	T10	15.30	20.50	30.0	9.0	•	

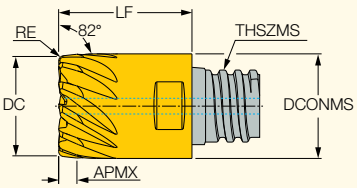
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

(1) Cutting diameter maximum
(2) Number of flutes
(3) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ET

Solid Carbide Tapered Heads with 20/30° Helix, Variable Pitch and Coolant Holes for CHATTERFREE Finishing Operations



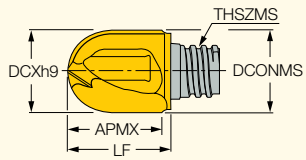
Designation	Dimensions DC	RE	NOF(1)	APMX	THSZMS	DCONMS	LF	RMPX°(2)	IC908	Recommended Machining Data f_z (mm/t)
MM ET11/8H4R10CF-8T08H	11.00	1.00	8	3.50	T08	12.00	16.50	3.0	●	0.04-0.10
MM ET15/8H4R10CF-12T10H	15.00	1.00	12	3.50	T10	16.00	20.50	3.0	●	0.05-0.11

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HCR

Interchangeable 2 Flute Solid Carbide Ball Nose Milling Heads



ECONOMICAL SOLUTION

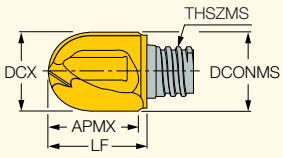
Designation	Dimensions DCX(1)	NOF(2)	APMX	THSZMS	DCONMS	LF	IC908
MM HCR080-2T05	8.00	2	7.80	T05	7.60	9.95	●
MM HCR100-2T06	10.00	2	10.00	T06	9.50	12.35	●
MM HCR120-2T08	12.00	2	11.45	T08	11.50	15.30	●
MM HCR160-2T10	16.00	2	15.80	T10	15.20	19.10	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HRF

Interchangeable 2 Flute Solid Carbide Ball Nose Finish Milling Heads



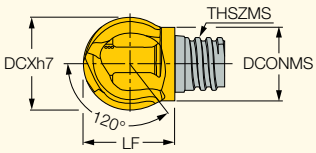
Designation	Dimensions DCX(1)	NOF(2)	APMX	THSZMS	DCONMS	LF	Tough ↔ Hard IC908	IC903
MM HRF080-2T05	8.00	2	7.60	T05	7.60	9.95		●
MM HRF100-2T06	10.00	2	10.20	T06	9.50	12.35	●	●
MM HRF120-2T08	12.00	2	11.50	T08	11.50	15.30		●
MM HRF160-2T10	16.00	2	15.80	T10	15.20	19.10		●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HBR

Interchangeable 2 Flute High Precision Ball Nose Solid Carbide Milling Heads



ECONOMICAL SOLUTION

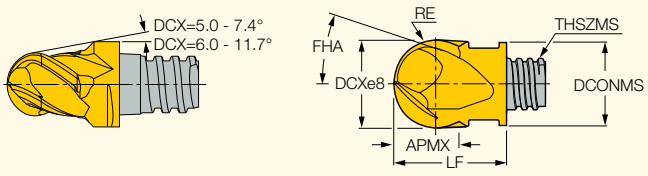
Designation	Dimensions DCX(1)	NOF(2)	THSZMS	DCONMS	LF	🔧	IC908
MM HBR080-2T04	8.00	2	T04	5.80	8.22	MM KEY 6X4*	●
MM HBR100-2T05	10.00	2	T05	7.60	10.00	MM KEY 6X4*	●
MM HBR120-2T06	12.00	2	T06	9.50	11.60	MM KEY 10X7*	●
MM HBR160-2T08	16.00	2	T08	12.20	15.40	MM KEY 13X8*	●
MM HBR200-2T10	20.00	2	T10	15.20	18.40	MM KEY 13X8*	●
MM HBR250-2T12	25.00	2	T12	18.30	23.20	MM KEY 16X9*	●

• For shanks, see pages 84-91 • For tightening torques and clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection.
• For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EB

Interchangeable Solid Carbide Ball Nose Milling Heads



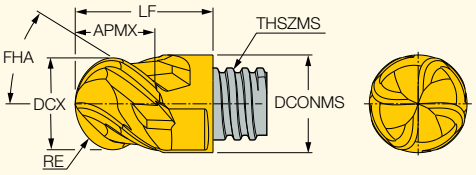
Designation	Dimensions DCX(2)	NOF(3)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC908
MM EB050E07-4T05	5.00	4	7.00	2.49	T05	8.00	15.00	38.0	●
MM EB060E04-4T04	6.00	4	4.00	2.99	T04	5.80	7.60	37.0	●
MM EB060E05-4T05	6.00	4	5.00	2.99	T05	8.00	10.00	38.0	●
MM EB080A05-2T05	8.00	2	5.00	3.98	T05	7.70	10.00	30.0	●
MM EB080A05-4T05	8.00	4	5.00	3.98	T05	7.70	10.00	30.0	●
MM EB100A07-2T06	10.00	2	7.00	4.98	T06	9.60	13.00	30.0	●
MM EB100A07-4T06	10.00	4	7.00	4.98	T06	9.60	13.00	30.0	●
MM EB120A09-2T08	12.00	2	9.00	5.98	T08	11.70	16.50	30.0	●
MM EB120H09CF-3T08I (1)	12.00	3	9.00	5.98	T08	11.70	16.50	38.0	●
MM EB120A09-4T08	12.00	4	9.00	5.98	T08	11.70	16.50	30.0	●
MM EB160A09-2T10	16.00	2	9.00	7.98	T10	15.30	20.50	30.0	●
MM EB160A12-4T10	16.00	4	12.00	7.98	T10	15.30	20.50	30.0	●
MM EB200A15-4T12	20.00	4	15.00	9.97	T12	18.45	25.50	30.0	●
MM EB250A22-4T15	25.00	4	22.00	12.47	T15	23.90	37.00	30.0	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) With coolant holes directed to each flute
(2) Cutting diameter maximum
(3) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EBC

Interchangeable Solid Carbide Ball Nose Milling Heads for High Productivity on Hard Materials



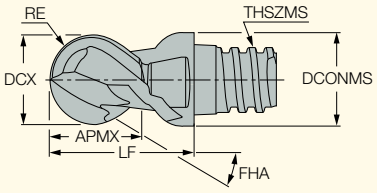
Designation	Dimensions DCX(1)	NOF(2)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC903
MM EBC080B05-4T05CF	8.00	4	5.40	3.98	T05	7.70	10.00	45.0	●
MM EBC100B07-4T06CF	10.00	4	7.40	4.98	T06	9.60	13.00	45.0	●
MM EBC120B09-4T08CF	12.00	4	9.30	5.98	T08	11.70	16.50	45.0	●
MM EBC160B12-4T10CF	16.00	4	12.40	7.98	T10	15.30	20.50	45.0	●
MM EBC200B15-4T12CF	20.00	4	16.00	9.97	T12	18.45	25.50	45.0	●

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes
* Optional, should be ordered separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EBA

Interchangeable 2 Flute High Precision Solid Carbide Ball Nose Heads for Machining Aluminum



ALUMINUM

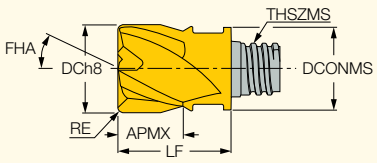
Designation	Dimensions DCX(1)	NOF(2)	APMX	RE	RETOL(3)	THSZMS	DCONMS	LF	FHA	IC08
MM EBA080B05-2T05	8.00	2	5.00	3.98	0.010	T05	7.70	10.00	45.0	●
MM EBA100B07-2T06	10.00	2	7.00	4.98	0.010	T06	9.60	13.00	45.0	●
MM EBA120B09-2T08	12.00	2	9.00	5.98	0.012	T08	11.50	16.50	45.0	●
MM EBA160B12-2T10	16.00	2	12.00	7.98	0.012	T10	15.30	20.50	45.0	●
MM EBA200B15-2T12	20.00	2	15.00	9.97	0.012	T12	18.45	25.50	45.0	●
MM EBA250B22-2T15	25.00	2	22.00	12.50	0.012	T15	23.90	37.00	45.0	●

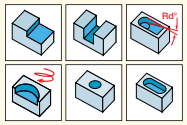
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Cutting diameter maximum
(2) Number of flutes
(3) Corner radius tolerance (+/-)

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ECU

Interchangeable 3 Flute Undersized Solid Carbide Heads for Keyways (DIN 6885)





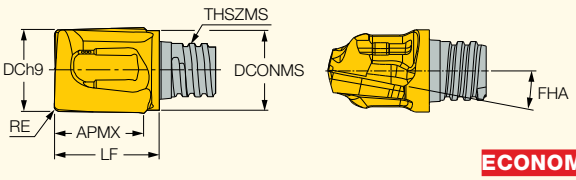
Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC908	Recommended Machining Data f_z (mm/t)
MM ECU077E04R020-3T05	7.70	3	4.00	0.20	T05	7.70	10.00	38.0	●	0.03-0.08
MM ECU097E05R030-3T06	9.70	3	5.00	0.30	T06	9.60	13.00	38.0	●	0.03-0.09
MM ECU117E07R030-3T08	11.70	3	7.00	0.30	T08	11.50	16.50	38.0	●	0.03-0.10
MM ECU157E08R030-3T10	15.70	3	8.00	0.30	T10	15.30	20.50	38.0	●	0.04-0.12
MM ECU197E12R040-3T12	19.70	3	12.00	0.40	T12	18.45	25.50	38.0	●	0.05-0.13

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM HC

Interchangeable Solid Carbide Slot Drill Milling Heads with Two 10° Helix Flutes



ECONOMICAL SOLUTION

Designation	Dimensions DC	NOF(1)	APMX	RE	Tm(2)	THSZMS	DCONMS	LF	FHA	Tough ↔ Hard IC908	IC903	Recommended Machining Data f_z (mm/t)
MM HC078C08R0.2-2T05	7.80	2	7.70	0.20	r0-2.0	T05	7.60	10.00	10.0	●		0.03-0.09
MM HC080C08R0.4-2T05	8.00	2	7.70	0.40	r0-2.0	T05	7.60	10.00	10.0	●	●	0.03-0.09
MM HC080C08R1.0-2T05	8.00	2	7.70	1.00	r0-2.0	T05	7.60	10.00	10.0	●	●	0.03-0.09
MM HC080C08R2.0-2T05	8.00	2	7.70	2.00	r0-2.0	T05	7.60	10.00	10.0	●	●	0.03-0.09
MM HC098C10R0.3-2T06	9.80	2	9.00	0.30	r0-3.0	T06	9.50	12.35	10.0	●		0.03-0.10
MM HC100C10R0.4-2T06	10.00	2	9.00	0.40	r0-3.0	T06	9.50	12.35	10.0	●	●	0.03-0.10
MM HC100C10R1.0-2T06	10.00	2	9.00	1.00	r0-3.0	T06	9.50	12.35	10.0	●	●	0.03-0.10
MM HC100C10R2.0-2T06	10.00	2	9.00	2.00	r0-3.0	T06	9.50	12.35	10.0	●	●	0.03-0.10
MM HC117C13R0.3-2T08	11.70	2	10.00	0.30	r0-3.0	T08	11.50	14.20	10.0	●		0.04-0.11
MM HC120C13R0.4-2T08	12.00	2	10.00	0.40	r0-3.0	T08	11.50	14.20	10.0	●	●	0.04-0.11
MM HC120C13R1.0-2T08	12.00	2	10.00	1.00	r0-3.0	T08	11.50	14.20	10.0	●	●	0.04-0.11
MM HC120C13R2.0-2T08	12.00	2	10.00	2.00	r0-3.0	T08	11.50	14.20	10.0	●	●	0.04-0.11
MM HC140C11R0.4-2T08	14.00	2	11.60	0.40	r0-4.0	T08	11.50	15.05	10.0	●		0.04-0.12
MM HC157C16R0.3-2T10	15.70	2	15.00	0.30	r0-4.0	T10	15.20	19.05	10.0	●		0.05-0.13
MM HC160C16R0.4-2T10	16.00	2	14.90	0.40	r0-4.0	T10	15.20	19.05	10.0	●	●	0.05-0.13
MM HC160C16R0.8-2T10	16.00	2	14.90	0.80	r0-4.0	T10	15.15	19.05	10.0	●	●	0.05-0.13

- For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

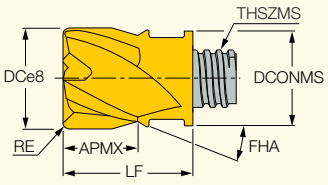
(1) Number of flutes

(2) Specially tailored radius range, available upon request.

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-3

Interchangeable 3 Flute Solid Carbide Endmill Heads with 45° Helix



Designation	Dimensions DC	NOF(2)	APMX	RE	THSZMS	LF	FHA	DCONMS	IC908	Recommended Machining Data f_z (mm/t)
MM EC080B05R000-3T05	8.00	3	5.00	0.00	T05	10.00	45.0	7.70	●	0.03-0.09
MM EC100B07R000-3T06	10.00	3	7.00	0.00	T06	13.00	45.0	9.60	●	0.03-0.10
MM EC100B12R000-3T06	10.00	3	12.00	0.00	T06	19.00	45.0	9.60	●	0.03-0.10
MM EC120B09R000-3T08I (1)	12.00	3	9.00	0.00	T08	16.50	45.0	11.70	●	0.04-0.11
MM EC120B09R000-3T08	12.00	3	9.00	0.00	T08	16.50	45.0	11.70	●	0.04-0.11

- For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
- Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

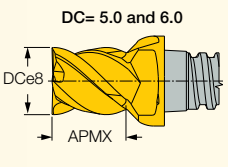
(1) With coolant holes directed to each flute

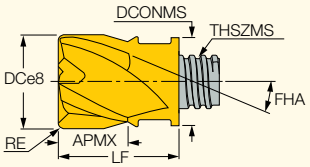
(2) Number of flutes

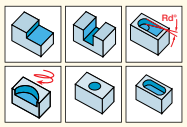
MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-4

Interchangeable 4 Flute Solid Carbide Endmill Heads with 30° and 45° Helix and Various Corner Radii







Designation	Dimensions DC	RE	FHA	NOF(1)	APMX	THSZMS	DCONMS	LF	IC908	Recommended Machining Data f_z (mm/t)
MM EC050B07R000-4T05	5.00	0.00	45.0	4	7.00	T05	8.00	15.00	•	0.02-0.06
MM EC060B05R000-4T05	6.00	0.00	45.0	4	5.00	T05	8.00	10.00	•	0.03-0.07
MM EC060B04R0.5-4T04	6.00	0.50	45.0	4	4.00	T04	5.80	8.50	•	0.02-0.04
MM EC080B05R000-4T05	8.00	0.00	45.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080B09R000-4T05	8.00	0.00	45.0	4	9.00	T05	7.70	15.00	•	0.03-0.09
MM EC080A05R0.5-4T05	8.00	0.50	30.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080A09R0.5-4T05	8.00	0.50	30.0	4	9.00	T05	7.70	15.00	•	0.03-0.09
MM EC080B05R0.5-4T05	8.00	0.50	45.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080A05R1.0-4T05	8.00	1.00	30.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080B05R1.0-4T05	8.00	1.00	45.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080A05R1.5-4T05	8.00	1.50	30.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC080B05R1.5-4T05	8.00	1.50	45.0	4	5.00	T05	7.70	10.00	•	0.03-0.09
MM EC100B07R000-4T06	10.00	0.00	45.0	4	7.00	T06	9.60	13.00	•	0.03-0.10
MM EC100B12R000-4T06	10.00	0.00	45.0	4	12.00	T06	9.60	19.00	•	0.03-0.10
MM EC100A07R0.5-4T06	10.00	0.50	30.0	4	7.00	T06	9.60	13.00	•	0.03-0.10
MM EC100B07R0.5-4T06	10.00	0.50	45.0	4	7.00	T06	9.60	13.00	•	0.03-0.10
MM EC100A07R1.0-4T06	10.00	1.00	30.0	4	7.00	T06	9.60	13.00	•	0.03-0.10
MM EC100B07R1.0-4T06	10.00	1.00	45.0	4	7.00	T06	9.60	13.00	•	0.03-0.10
MM EC120B09R000-4T08	12.00	0.00	45.0	4	9.00	T08	11.70	16.50	•	0.04-0.11
MM EC120B14R000-4T08	12.00	0.00	45.0	4	14.00	T08	11.70	23.00	•	0.04-0.11
MM EC120A09R0.5-4T08	12.00	0.50	30.0	4	9.00	T08	11.70	16.50	•	0.04-0.11
MM EC120B09R0.5-4T08	12.00	0.50	45.0	4	9.00	T08	11.70	16.50	•	0.04-0.11
MM EC120A09R1.0-4T08	12.00	1.00	30.0	4	9.00	T08	11.70	16.50	•	0.04-0.11
MM EC120B09R1.0-4T08	12.00	1.00	45.0	4	9.00	T08	11.70	16.50	•	0.04-0.11
MM EC160B12R000-4T10	16.00	0.00	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R0.5-4T10	16.00	0.50	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R0.5-4T10	16.00	0.50	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R1.0-4T10	16.00	1.00	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R1.0-4T10	16.00	1.00	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R1.5-4T10	16.00	1.50	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R1.5-4T10	16.00	1.50	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R2.0-4T10	16.00	2.00	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R2.0-4T10	16.00	2.00	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R3.0-4T10	16.00	3.00	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R3.0-4T10	16.00	3.00	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160A12R4.0-4T10	16.00	4.00	30.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC160B12R4.0-4T10	16.00	4.00	45.0	4	12.00	T10	15.30	20.50	•	0.05-0.13
MM EC200B15R000-4T12	20.00	0.00	45.0	4	15.00	T12	18.45	25.50	•	0.05-0.13
MM EC200A15R0.5-4T12	20.00	0.50	30.0	4	15.00	T12	18.45	25.50	•	0.05-0.13
MM EC200A15R1.0-4T12	20.00	1.00	30.0	4	15.00	T12	18.45	25.50	•	0.05-0.13
MM EC200A15R2.0-4T12	20.00	2.00	30.0	4	15.00	T12	18.45	25.50	•	0.05-0.13
MM EC200A15R3.0-4T12	20.00	3.00	30.0	4	15.00	T12	18.45	25.50	•	0.05-0.13

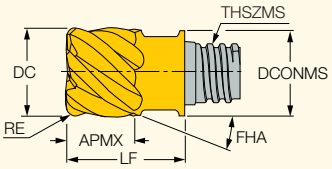
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-6

Interchangeable 6 Flute Solid Carbide Endmill Heads with 30° and 45° Helix and Various Corner Radii



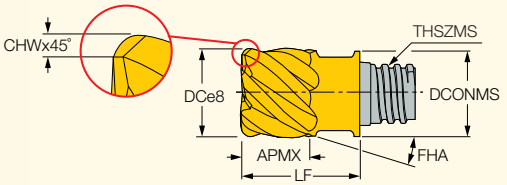
Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	RMPX°(2)	IC908	Recommended Machining Data f_z (mm/t)
MM EC080A05R0.5-6T05	8.00	6	5.00	0.50	T05	7.70	10.00	30.0	6.0	•	0.03-0.09
MM EC080A05R1.0-6T05	8.00	6	5.00	1.00	T05	7.70	10.00	30.0	6.0	•	0.03-0.09
MM EC080A05R1.5-6T05	8.00	6	5.00	1.50	T05	7.70	10.00	30.0	6.0	•	0.03-0.09
MM EC080B05R0.5-6T05	8.00	6	5.00	0.50	T05	7.70	10.00	45.0	3.0	•	0.03-0.10
MM EC080B05R1.0-6T05	8.00	6	5.00	1.00	T05	7.70	10.00	45.0	3.0	•	0.03-0.09
MM EC080B05R1.5-6T05	8.00	6	5.00	1.50	T05	7.70	10.00	45.0	3.0	•	0.03-0.09
MM EC100A07R0.5-6T06	10.00	6	7.00	0.50	T06	9.60	13.00	30.0	6.0	•	0.03-0.10
MM EC100A07R1.0-6T06	10.00	6	7.00	1.00	T06	9.60	13.00	30.0	6.0	•	0.03-0.10
MM EC100A07R1.5-6T06	10.00	6	7.00	1.50	T06	9.60	13.00	30.0	6.0	•	0.03-0.10
MM EC100B07R0.5-6T06	10.00	6	7.00	0.50	T06	9.60	13.00	45.0	3.0	•	0.04-0.10
MM EC100B07R000-6T06	10.00	6	7.00	0.00	T06	9.60	13.00	45.0	3.0	•	0.03-0.10
MM EC100B07R1.0-6T06	10.00	6	7.00	1.00	T06	9.60	13.00	45.0	3.0	•	0.04-0.10
MM EC100B07R1.5-6T06	10.00	6	7.00	1.50	T06	9.60	13.00	45.0	3.0	•	0.03-0.10
MM EC100B12R1.5-6T06	10.00	6	12.00	1.50	T06	9.60	19.00	45.0	3.0	•	0.04-0.10
MM EC120A09R0.5-6T08	12.00	6	9.00	0.50	T08	11.70	16.50	30.0	6.0	•	0.04-0.11
MM EC120A09R1.0-6T08	12.00	6	9.00	1.00	T08	11.70	16.50	30.0	6.0	•	0.04-0.11
MM EC120B09R0.5-6T08	12.00	6	9.00	0.50	T08	11.70	16.50	45.0	3.0	•	0.04-0.10
MM EC120B09R000-6T08	12.00	6	9.00	0.00	T08	11.70	16.50	45.0	3.0	•	0.04-0.11
MM EC120B09R1.0-6T08	12.00	6	9.00	1.00	T08	11.70	16.50	45.0	3.0	•	0.04-0.10
MM EC120B09R1.5-6T08	12.00	6	9.00	1.50	T08	11.70	16.50	45.0	3.0	•	0.04-0.11

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-D

Interchangeable 6, 8, 10 Flute Solid Carbide Endmill Heads with 50° Helix for Machining Hardened Steel



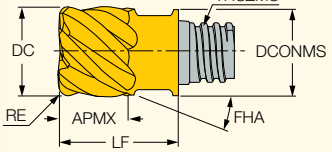
Designation	Dimensions DC	NOF(1)	APMX	CHW	KCH	THSZMS	DCONMS	LF	FHA	RMPX°(2)	IC903	Recommended Machining Data f_z (mm/t)
MM EC080D05C01-6T05	8.00	6	5.00	0.10	45.0	T05	7.70	10.00	50.0	2.0	•	0.03-0.10
MM EC100D07C01-6T06	10.00	6	7.00	0.10	45.0	T06	9.60	13.00	50.0	2.0	•	0.03-0.10
MM EC120D09C01-6T08	12.00	6	9.00	0.10	45.0	T08	11.70	16.50	50.0	3.0	•	0.04-0.11
MM EC160D12C02-8T10	16.00	8	12.00	0.20	45.0	T10	15.30	20.50	50.0	3.0	•	0.05-0.13
MM EC200D15C02-10T12	20.00	10	15.00	0.20	45.0	T12	18.45	25.50	50.0	3.0	•	0.05-0.13

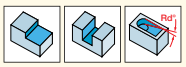
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-8/10

Interchangeable 8, 10 Flute Solid Carbide Endmill Heads with 30° and 45° Helix and Various Corner Radii





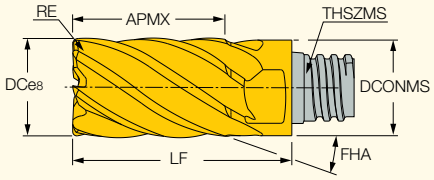
Designation	Dimensions DC	NOF(2)	APMX	RE	THSZMS	DCONMS	LF	FHA	RMPX°(3)	IC908	Recommended Machining Data f_z (mm/t)
MM EC160A12R0.5-8T10	16.00	8	12.00	0.50	T10	15.30	20.50	30.0	5.0	•	0.05-0.13
MM EC160A12R0.5-8T10H (1)	16.00	8	12.00	0.50	T10	15.30	20.50	30.0	5.0	•	0.05-0.13
MM EC160A12R1.0-8T10	16.00	8	12.00	1.00	T10	15.30	20.50	30.0	5.0	•	0.05-0.13
MM EC160A12R1.6-8T10	16.00	8	12.00	1.60	T10	15.30	20.50	30.0	5.0	•	0.05-0.13
MM EC160A12R2.0-8T10	16.00	8	12.00	2.00	T10	15.30	20.50	30.0	5.0	•	0.05-0.13
MM EC160B12R0.5-8T10	16.00	8	12.00	0.50	T10	15.30	20.50	45.0	5.0	•	0.05-0.13
MM EC160B12R1.0-8T10	16.00	8	12.00	1.00	T10	15.30	20.50	45.0	5.0	•	0.05-0.13
MM EC160B12R1.6-8T10	16.00	8	12.00	1.60	T10	15.30	20.50	45.0	5.0	•	0.05-0.13
MM EC160B12R2.0-8T10	16.00	8	12.00	2.00	T10	15.30	20.50	45.0	5.0	•	0.05-0.13
MM EC200A15R1.0-10T12	20.00	10	15.00	1.00	T12	18.45	25.50	30.0	3.0	•	0.05-0.13
MM EC200A15R2.0-10T12	20.00	10	15.00	2.00	T12	18.45	25.50	30.0	3.0	•	0.05-0.13
MM EC250A22R0.8-10T15	25.00	10	22.00	0.80	T15	23.90	37.00	30.0	3.0	•	0.05-0.13

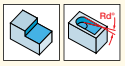
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) With a central coolant hole
(2) Number of flutes
(3) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-CF-Z7/9-1.5xD

Interchangeable 7, 9 Flute Solid Carbide Endmill Heads with 36° Helix and 1.5xD Flute Lengths





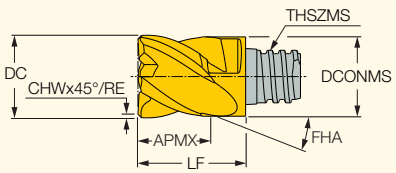
Designation	Dimensions DC	APMX	RE	NOF(1)	THSZMS	DCONMS	LF	FHA	RMPX°(2)	IC908	Recommended Machining Data f_z (mm/t)
MM EC080H12R05CF-7T05	8.00	12.00	0.50	7	T05	7.70	18.00	36.0	3.0	•	0.03-0.10
MM EC100H15R05CF-7T06	10.00	15.00	0.50	7	T06	9.60	22.00	36.0	3.0	•	0.04-0.10
MM EC120H18R05CF-7T08	12.00	18.00	0.50	7	T08	11.70	27.00	36.0	3.0	•	0.04-0.10
MM EC160H24R08CF-9T10	16.00	24.00	0.80	9	T10	15.30	33.50	36.0	1.0	•	0.05-0.10
MM EC200H30R10CF-9T12	20.00	30.00	1.00	9	T12	18.45	41.00	36.0	1.0	•	0.05-0.10
MM EC250H37R10CF-9T15	25.00	37.00	1.00	9	T15	23.90	52.50	36.0	1.0	•	0.05-0.10

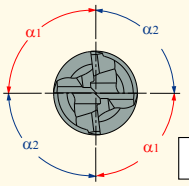
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE
CHATTERFREE
MULTI-MASTER LINE

MM EC-CF

Interchangeable Solid Carbide Endmill Heads for CHATTERFREE Roughing and Finishing Operations





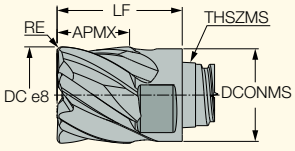
Designation	Dimensions DC	RE	NOF(2)	APMX	THSZMS	DCONMS	LF	FHA	CHW	KCH	IC908	Recommended Machining Data f_z (mm/t)
MM EC080E05C3CF-4T05	8.00	-	4	5.00	T05	7.70	10.00	38.0	0.30	45.0	•	0.03-0.09
MM EC080E05R0CF-4T05	8.00	-	4	5.00	T05	7.70	10.00	38.0	-	-	•	0.03-0.09
MM EC080E05R05CF-4T05	8.00	0.50	4	5.00	T05	7.70	10.00	38.0	-	-	•	0.03-0.09
MM EC100E07C4CF-4T06	10.00	-	4	7.00	T06	9.60	13.00	38.0	0.40	45.0	•	0.03-0.10
MM EC100E07R00CF-4T06	10.00	-	4	7.00	T06	9.60	13.00	38.0	-	-	•	0.03-0.10
MM EC100E07R02CF-4T06	10.00	0.20	4	7.00	T06	9.60	13.00	38.0	-	-	•	0.03-0.10
MM EC100E07R04CF-4T06	10.00	0.40	4	7.00	T06	9.60	13.00	38.0	-	-	•	0.03-0.10
MM EC100E07R05CF-4T06	10.00	0.50	4	7.00	T06	9.60	13.00	38.0	-	-	•	0.03-0.10
MM EC100E07R25CF-4T06	10.00	2.50	4	7.00	T06	9.60	13.00	38.0	-	-	•	0.03-0.10
MM EC120E09C5CF-4T08	12.00	-	4	9.00	T08	11.70	16.50	38.0	0.50	45.0	•	0.04-0.11
MM EC120E09C5CF-4T08I (1)	12.00	-	4	9.00	T08	11.70	16.50	38.0	0.50	45.0	•	0.04-0.11
MM EC120E09R00CF-4T08	12.00	-	4	9.00	T08	11.70	16.50	38.0	-	-	•	0.04-0.11
MM EC120E09R02CF-4T08	12.00	0.20	4	9.00	T08	11.70	16.50	38.0	-	-	•	0.04-0.11
MM EC120E09R04CF-4T08	12.00	0.40	4	9.00	T08	11.70	16.50	38.0	-	-	•	0.04-0.11
MM EC120E09R05CF-4T08	12.00	0.50	4	9.00	T08	11.70	16.50	38.0	-	-	•	0.04-0.11
MM EC120E09R15CF-4T08	12.00	1.50	4	9.00	T08	11.70	16.50	38.0	-	-	•	0.04-0.11
MM EC160E12C6CF-4T10	16.00	-	4	12.00	T10	15.30	20.50	38.0	0.60	45.0	•	0.05-0.13
MM EC160E12R05CF-4T10	16.00	0.50	4	12.00	T10	15.30	20.50	38.0	-	-	•	0.05-0.13
MM EC200E15C6CF-4T12	20.00	-	4	15.00	T12	18.45	25.50	38.0	0.60	45.0	•	0.05-0.17
MM EC200E15R05CF-4T12	20.00	0.50	4	15.00	T12	18.45	25.50	38.0	-	-	•	0.05-0.17
MM EC250E28C6CF-12T15	25.00	-	12	28.00	T15	23.90	43.00	38.0	0.60	45.0	•	0.06-0.13
MM EC250E28C6CF-4T15	25.00	-	4	28.00	T15	23.90	43.00	38.0	0.60	45.0	•	0.06-0.17
MM EC250E22C6CF-4T15	25.00	-	4	22.00	T15	23.90	37.00	38.0	0.60	45.0	•	0.06-0.17
MM EC250E22R05CF-4T15	25.00	0.50	4	22.00	T15	23.90	37.00	38.0	-	-	•	0.06-0.17
MM EC250E22R10CF-4T15	25.00	1.00	4	22.00	T15	23.90	37.00	38.0	-	-	•	0.06-0.17
MM EC250E22R20CF-4T15	25.00	2.00	4	22.00	T15	23.90	37.00	38.0	-	-	•	0.06-0.17
MM EC250E22R30CF-4T15	25.00	3.00	4	22.00	T15	23.90	37.00	38.0	-	-	•	0.06-0.17
MM EC320H38C06-4T21	32.00	-	4	38.00	T21	30.00	55.00	38.0	0.60	45.0	•	0.06-0.18

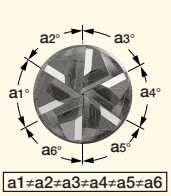
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) With coolant holes directed to each flute
(2) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ECK-CF

5, 6 Flute Solid Carbide Heads with 35°/38° Helix Featuring Different Corner Radii For Machining Titanium Alloys





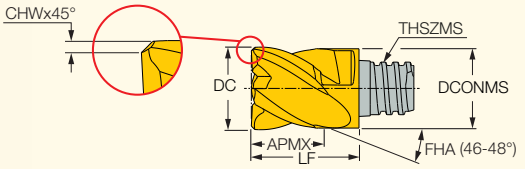
Designation	Dimensions DC	RE	NOF(1)	APMX	THSZMS	DCONMS	LF	RMPX°(2)	IC908	Recommended Machining Data f_z (mm/t)
MM ECK080H05R04-6T05CF	8.00	0.40	6	5.00	T05	7.70	10.00	5.0	•	0.04-0.08
MM ECK100H07R05-6T06CF	10.00	0.50	6	7.00	T06	9.60	13.00	5.0	•	0.04-0.08
MM ECK120H09R05-6T08CF	12.00	0.50	6	9.00	T08	11.70	16.50	5.0	•	0.04-0.08
MM ECK160H12R08-6T10CF	16.00	0.80	6	12.00	T10	15.30	20.50	5.0	•	0.07-0.12
MM ECK200H15R10-6T12CF	20.00	1.00	6	15.00	T12	18.45	25.50	5.0	•	0.07-0.12
MM ECK250H22R10-6T15CF	25.00	1.00	6	22.00	T15	23.90	37.00	5.0	•	0.07-0.12
MM ECK320H38R4-5T21	32.00	4.00	5	38.00	T21	30.00	55.00	1.0	•	0.06-0.18
MM ECK320H38R5-5T21	32.00	5.00	5	38.00	T21	30.00	55.00	1.0	•	0.06-0.18

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-H-4-CF

Interchangeable Solid Carbide Endmill Heads for CHATTERFREE Milling of Alloyed Steel



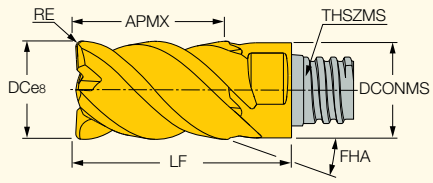
Designation	Dimensions DC	NOF(1)	APMX	THSZMS	DCONMS	LF	CHW	KCH	IC908	Recommended Machining Data f_z (mm/t)
MM EC080H05C3-4T05CF	8.00	4	5.00	T05	7.70	10.00	0.30	45.0	●	0.03-0.09
MM EC100H07C4-4T06CF	10.00	4	7.00	T06	9.60	13.00	0.40	45.0	●	0.03-0.10
MM EC120H09C5-4T08CF	12.00	4	9.00	T08	11.70	16.50	0.50	45.0	●	0.04-0.11
MM EC160H12C6-4T10CF	16.00	4	12.00	T10	15.30	20.50	0.60	45.0	●	0.05-0.13
MM EC200H15C6-4T12CF	20.00	4	15.00	T12	18.45	25.50	0.60	45.0	●	0.05-0.17

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE
CHATTERFREE
MULTI-MASTER LINE

MM EC-CF-Z4-1.5xD

Interchangeable Solid Carbide Endmill Heads with 1.5xD Flute Lengths for CHATTERFREE Roughing and Finishing



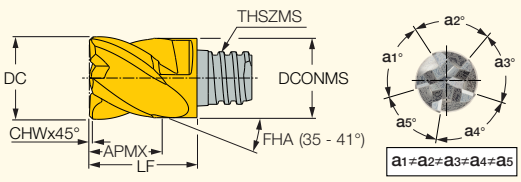
Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC908	Recommended Machining Data f_z (mm/t)
MM EC080H12R05CF-4T05	8.00	4	12.00	0.50	T05	7.70	18.00	46.5	●	0.03-0.09
MM EC100H15R05CF-4T06	10.00	4	15.00	0.50	T06	9.60	22.00	46.5	●	0.03-0.10
MM EC120H18R05CF-4T08	12.00	4	18.00	0.50	T08	11.70	27.00	46.5	●	0.04-0.11
MM EC160H24R05CF-4T10	16.00	4	24.00	0.50	T10	15.30	33.50	46.5	●	0.05-0.13
MM EC200H30R05CF-4T12	20.00	4	30.00	0.50	T12	18.45	41.00	46.5	●	0.05-0.17
MM EC250H37R05CF-4T15	25.00	4	37.00	0.50	T15	23.90	52.50	46.5	●	0.06-0.17

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EC-H-5-CF

Interchangeable Solid Carbide Endmill Heads for CHATTERFREE Milling of High Temperature Alloys like Titanium and Inconel



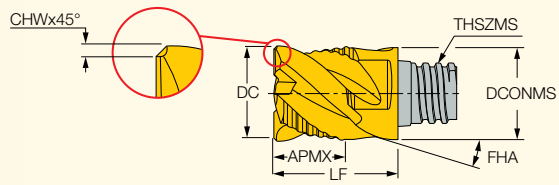
Designation	Dimensions DC	NOF(1)	APMX	THSZMS	DCONMS	LF	RMPX°(2)	CHW	KCH	IC308	Recommended Machining Data f_z (mm/t)
MM EC080H05C3-5T05CF	8.00	5	5.00	T05	7.70	10.00	5.0	0.30	45.0	●	0.03-0.09
MM EC100H07C4-5T06CF	10.00	5	7.00	T06	9.60	13.00	5.0	0.40	45.0	●	0.03-0.10
MM EC120H09C5-5T08CF	12.00	5	9.00	T08	11.70	16.50	4.0	0.50	45.0	●	0.04-0.11
MM EC160H12C6-5T10CF	16.00	5	12.00	T10	15.30	20.50	4.0	0.60	45.0	●	0.05-0.13
MM EC200H15C6-5T12CF	20.00	5	15.00	T12	18.45	25.50	3.0	0.60	45.0	●	0.05-0.17
MM EC250H22C6-5T15CF	25.00	5	22.00	T15	23.90	37.00	3.0	0.60	45.0	●	0.06-0.17

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE
FINISHRED
MULTI-MASTER LINE

MM EFS

Combination of Interchangeable Solid Carbide Endmill Heads for Roughing and Finishing



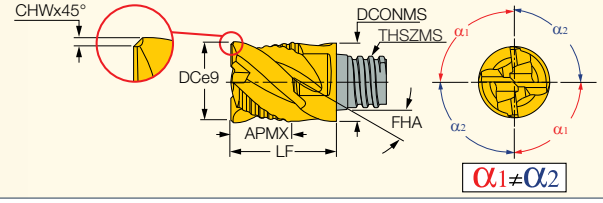
Designation	Dimensions DC	NOF(1)	APMX	THSZMS	DCONMS	LF	FHA	CHW	KCH	IC908	Recommended Machining Data f_z (mm/t)
MM EFS080B05-4T05	8.00	4	5.00	T05	7.70	10.00	45.0	0.30	45.0	•	0.03-0.08
MM EFS100B07-4T06	10.00	4	7.00	T06	9.60	13.00	45.0	0.30	45.0	•	0.03-0.09
MM EFS120B09-4T08	12.00	4	9.00	T08	11.70	16.50	45.0	0.40	45.0	•	0.04-0.10
MM EFS160B12-4T10	16.00	4	12.00	T10	15.30	20.50	45.0	0.60	45.0	•	0.05-0.11
MM EFS200B15-4T12	20.00	4	15.00	T12	18.45	25.50	45.0	0.60	45.0	•	0.05-0.11
MM EFS250B22-4T15	25.00	4	22.00	T15	23.90	37.00	45.0	0.60	45.0	•	0.06-0.11

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

FINISHRED
MULTI-MASTER LINE
CHATTERFREE
MULTI-MASTER LINE

MM EFS-CF

4 Flute Solid Carbide Heads with 38° Helix and Variable Pitch for CHATTERFREE Roughing and Finishing Applications



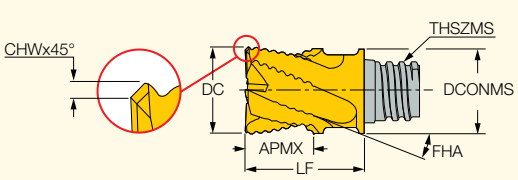
Designation	Dimensions DC	NOF(1)	APMX	CHW	KCH	THSZMS	DCONMS	LF	FHA	IC908	Recommended Machining Data f_z (mm/t)
MM EFS060E05-4T05 CF	6.00	4	5.00	0.25	45.0	T05	7.70	10.00	38.0	•	0.03-0.08
MM EFS080E05-4T05 CF	8.00	4	5.00	0.30	45.0	T05	7.70	10.00	38.0	•	0.03-0.08
MM EFS100E07-4T06 CF	10.00	4	7.00	0.40	45.0	T06	9.60	13.00	38.0	•	0.03-0.09
MM EFS120E09-4T08 CF	12.00	4	9.00	0.50	45.0	T08	11.70	16.50	38.0	•	0.04-0.10
MM EFS160E12-4T10 CF	16.00	4	12.00	0.60	45.0	T10	15.30	20.50	38.0	•	0.05-0.11
MM EFS200E15-4T12 CF	20.00	4	16.00	0.60	45.0	T12	18.45	25.50	38.0	•	0.05-0.11
MM EFS250E22-4T15 CF	25.00	4	22.00	0.60	45.0	T15	23.90	37.00	38.0	•	0.06-0.11

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ERS

Interchangeable Solid Carbide Rough Milling Heads for High Metal Removal Rates



Designation	Dimensions DC	NOF(3)	APMX	THSZMS	DCONMS	LF	FHA	RMPX°(4)	CHW	KCH	IC908	Recommended Machining Data f_z (mm/t)
MM ERS080B05-4T05	8.00	4	5.00	T05	7.70	10.00	45.0	5.0	0.25	45.0	•	0.03-0.08
MM ERS080B09-4T05	8.00	4	9.00	T05	7.70	15.00	45.0	5.0	0.25	45.0	•	0.03-0.08
MM ERS100B07-4T06	10.00	4	7.00	T06	9.60	13.00	45.0	5.0	0.30	45.0	•	0.03-0.09
MM ERS120B09-4T08	12.00	4	9.00	T08	11.70	16.50	45.0	5.0	0.35	45.0	•	0.04-0.10
MM ERS120B09-4T08H (1)	12.00	4	9.00	T08	11.70	16.50	45.0	5.0	0.35	45.0	•	0.04-0.10
MM ERS120B09-4T08I (2)	12.00	4	9.00	T08	11.70	16.50	45.0	5.0	0.35	45.0	•	0.04-0.11
MM ERS120B14-4T08	12.00	4	14.00	T08	11.70	23.00	45.0	5.0	0.35	45.0	•	0.04-0.10
MM ERS160B12-5T10	16.00	5	12.00	T10	15.30	20.50	45.0	5.0	0.40	45.0	•	0.04-0.10
MM ERS160B12-5T10H (1)	16.00	5	12.00	T10	15.30	20.50	45.0	5.0	0.40	45.0	•	0.04-0.10
MM ERS200B15-6T12	20.00	6	15.00	T12	18.45	25.50	45.0	3.0	0.40	45.0	•	0.05-0.11
MM ERS250B22-6T15	25.00	6	22.00	T15	23.90	37.00	45.0	3.0	0.50	45.0	•	0.05-0.11

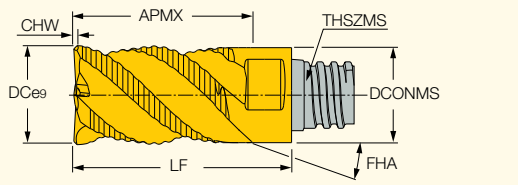
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184

(1) With a central coolant hole
(2) With coolant holes directed to each flute
(3) Number of flutes
(4) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ERS-1.5xD

Interchangeable Solid Carbide Rough Milling Heads with 1.5xD Flute Lengths for High Metal Removal Rates



Designation	Dimensions DC	NOF(1)	APMX	CHW	KCH	THSZMS	DCONMS	LF	FHA	RMPX°(2)	IC908	Recommended Machining Data f_z (mm/t)
MM ERS080B12-4T05	8.00	4	12.00	0.25	45.0	T05	7.70	18.00	46.0	5.0	•	0.03-0.08
MM ERS100B15-4T06	10.00	4	15.00	0.30	45.0	T06	9.60	22.00	46.0	5.0	•	0.03-0.09
MM ERS120B18-4T08	12.00	4	18.00	0.35	45.0	T08	11.70	27.00	46.0	5.0	•	0.04-0.10
MM ERS160B24-5T10	16.00	5	24.00	0.40	45.0	T10	15.30	33.50	40.0	5.0	•	0.04-0.10
MM ERS200B30-6T12	20.00	6	30.00	0.40	45.0	T12	18.45	41.00	47.0	3.0	•	0.05-0.11
MM ERS250B37-6T15	25.00	6	37.00	0.50	45.0	T15	23.90	52.50	47.0	3.0	•	0.05-0.11

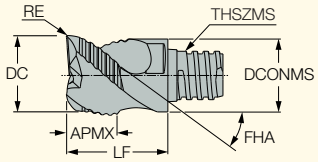
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection • For user guide see pages 44, 177-184

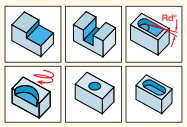
(1) Number of flutes
(2) Maximum ramping angle

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ERA

Interchangeable Solid Carbide Rough Milling Heads for Machining Aluminum at High Metal Removal Rates





ALUMINUM

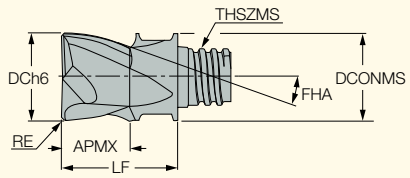
Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC08	Recommended Machining Data f_z (mm/t)
MM ERA080B05R0.2-3T05	8.00	3	5.00	0.20	T05	7.70	10.00	45.0	•	0.03-0.15
MM ERA100B06R0.2-3T06	10.00	3	6.00	0.20	T06	9.60	13.00	45.0	•	0.05-0.20
MM ERA120B08R0.2-3T08	12.00	3	8.00	0.20	T08	11.70	16.50	45.0	•	0.07-0.22
MM ERA160B10R0.2-3T10	16.00	3	10.00	0.20	T10	15.30	20.50	45.0	•	0.07-0.25
MM ERA200B12R0.2-3T12	20.00	3	12.00	0.20	T12	18.45	25.50	45.0	•	0.07-0.25
MM ERA250B19R0.2-3T15	25.00	3	19.00	0.20	T15	23.90	37.00	45.0	•	0.07-0.25

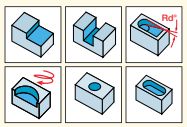
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM EA

Interchangeable Solid Carbide Slot Drill Milling Heads for Machining Aluminum





ALUMINUM

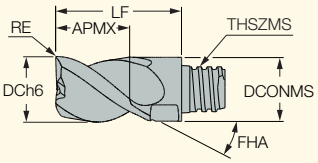
Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC08	Recommended Machining Data f_z (mm/t)
MM EA080B05R0.5-2T05	8.00	2	5.00	0.50	T05	7.70	10.00	45.0	•	0.03-0.09
MM EA080B05R0.5-3T05	8.00	3	5.00	0.50	T05	7.70	10.00	45.0	•	0.03-0.09
MM EA100B07R0.5-2T06	10.00	2	7.00	0.50	T06	9.60	13.00	45.0	•	0.03-0.10
MM EA100B07R1.0-2T06	10.00	2	7.00	1.00	T06	9.60	13.00	45.0	•	0.03-0.10
MM EA100B06R0.5-3T06	10.00	3	6.00	0.50	T06	9.60	13.00	45.0	•	0.03-0.10
MM EA100B06R1.0-3T06	10.00	3	6.00	1.00	T06	9.60	13.00	45.0	•	0.03-0.10
MM EA120B09R0.5-2T08	12.00	2	9.00	0.50	T08	11.70	16.50	45.0	•	0.04-0.11
MM EA120B09R1.0-2T08	12.00	2	9.00	1.00	T08	11.70	16.50	45.0	•	0.04-0.11
MM EA120B08R0.5-3T08	12.00	3	8.00	0.50	T08	11.70	16.50	45.0	•	0.04-0.11
MM EA120B08R1.0-3T08	12.00	3	8.00	1.00	T08	11.70	16.50	45.0	•	0.04-0.11
MM EA120B08R3.0-3T08	12.00	3	8.00	3.00	T08	11.70	16.50	45.0	•	0.04-0.11
MM EA160B10R000-3T10	16.00	3	10.00	0.00	T10	15.30	20.50	45.0	•	0.05-0.13
MM EA160B10R1.0-3T10	16.00	3	10.00	1.00	T10	15.30	20.50	45.0	•	0.05-0.13
MM EA160B10R2.0-3T10	16.00	3	10.00	2.00	T10	15.30	20.50	45.0	•	0.05-0.13
MM EA160B10R3.0-3T10	16.00	3	10.00	3.00	T10	15.30	20.50	45.0	•	0.05-0.13
MM EA160B10R4.0-3T10	16.00	3	10.00	4.00	T10	15.30	20.50	45.0	•	0.05-0.13
MM EA200B12R0.5-3T12	20.00	3	12.00	0.50	T12	18.45	25.50	45.0	•	0.05-0.13
MM EA200B12R1.0-3T12	20.00	3	12.00	1.00	T12	18.45	25.50	45.0	•	0.05-0.13
MM EA200B12R2.0-3T12	20.00	3	12.00	2.00	T12	18.45	25.50	45.0	•	0.05-0.13
MM EA200B12R3.0-3T12	20.00	3	12.00	3.00	T12	18.45	25.50	45.0	•	0.05-0.13
MM EA200B12R4.0-3T12	20.00	3	12.00	4.00	T12	18.45	25.50	45.0	•	0.05-0.13

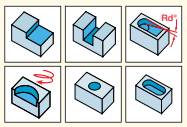
• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection.
(1) Number of flutes

CHATTERFREE
MULTI-MASTER LINE

MM EA-CF

Interchangeable Solid Carbide Endmill Heads with Different Helix for Machining Aluminum





ALUMINUM

Designation	Dimensions DC	NOF(1)	APMX	RE	THSZMS	DCONMS	LF	FHA	IC08	Recommended Machining Data f_z (mm/t)
MM EA080H08R0CF-4T05	8.00	4	8.00	0.00	T05	7.70	15.00	40.0	●	0.03-0.09
MM EA100H10R0CF-4T06	10.00	4	10.00	0.00	T06	9.60	19.00	40.0	●	0.03-0.10
MM EA120H12R0.2CF-3T08	12.00	3	12.00	0.20	T08	11.70	23.00	40.0	●	0.04-0.11
MM EA120H12R0CF-4T08	12.00	4	12.00	0.00	T08	11.70	23.00	40.0	●	0.04-0.11
MM EA160H16R0.0CF-3T10	16.00	3	16.00	0.00	T10	15.30	28.00	40.0	●	0.05-0.13
MM EA160H16R0.2CF-3T10	16.00	3	16.00	0.20	T10	15.30	28.00	40.0	●	0.05-0.13
MM EA160H16R0.5CF-3T10	16.00	3	16.00	0.50	T10	15.30	28.00	40.0	●	0.05-0.13
MM EA160H16R2.5CF-3T10	16.00	3	16.00	2.50	T10	15.30	28.00	40.0	●	0.05-0.13
MM EA160H16R0CF-4T10	16.00	4	16.00	0.00	T10	15.30	26.00	40.0	●	0.05-0.12
MM EA200H20R0.0CF-3T12	20.00	3	20.00	0.00	T12	18.45	34.00	40.0	●	0.05-0.13
MM EA200H20R0.2CF-3T12	20.00	3	20.00	0.20	T12	18.45	34.00	40.0	●	0.05-0.13
MM EA200H20R0.5CF-3T12	20.00	3	20.00	0.50	T12	18.45	34.00	40.0	●	0.05-0.13
MM EA200H20R2.5CF-3T12	20.00	3	20.00	2.50	T12	18.45	34.00	40.0	●	0.05-0.13
MM EA250H19R0.5-3T15	25.00	3	19.00	0.50	T15	23.90	37.00	40.0	●	0.06-0.16
MM EA250H19R1.0-3T15	25.00	3	19.00	1.00	T15	23.90	37.00	40.0	●	0.06-0.16
MM EA250H19R3.0-3T15	25.00	3	19.00	3.00	T15	23.90	37.00	40.0	●	0.06-0.16

• For shanks, see pages 84-91 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see pages 91-92
• Do not apply lubricant to the threaded connection. • For user guide see pages 44, 177-184
(1) Number of flutes

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ESR BLANKS

Interchangeable Solid Carbide Blank Heads

Fig. 1

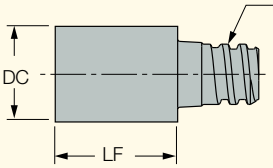
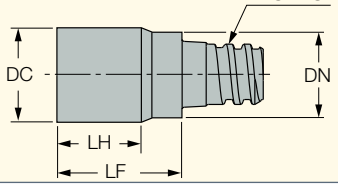


Fig. 2

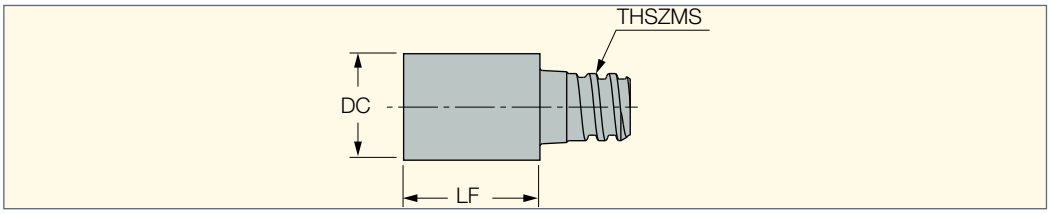


Designation	Dimensions DC	LF	THSZMS	LH	DN	Fig.	Tough ↔ Hard IC08	IC03
MM ESR-G 080-10 T05	8.00	10.35	T05	-	-	1	●	●
MM ESR-G 080-15 T05	8.00	15.40	T05	-	-	1	●	
MM ESR-G 100-13 T05	10.00	13.35	T05	-	-	1	●	
MM ESR-G 100-13 T06	10.00	13.35	T06	-	-	1	●	●
MM ESR-G 100-19 T06	10.00	19.45	T06	-	-	1	●	
MM ESR-G 120-17 T06	12.00	17.05	T06	-	-	1	●	
MM ESR-G 120-17 T08	12.00	17.05	T08	-	-	1	●	
MM ESR-G 120-23 T08	12.00	23.40	T08	-	-	1	●	
MM ESR-G 160-21 T08	16.00	20.90	T08	-	-	1	●	
MM ESR-G 160-21 T10	16.00	20.90	T10	-	-	1	●	●
MM ESR-G 160-28 T08	16.00	28.45	T08	-	-	1	●	
MM ESR-G 160-28 T10	16.00	28.45	T10	-	-	1	●	
MM ESR-G 200-26 T12	20.00	28.10	T12	16.6	18.45	2	●	●
MM ESR-G 200-34 T12	20.00	34.50	T12	-	-	1	●	
MM ESR-G 250-25 T15	25.00	25.60	T15	-	-	1	●	●
MM ESR-G 250-37 T12	25.00	37.60	T12	-	-	1	●	
MM ESR-G 250-37 T15	25.00	37.60	T15	-	-	1	●	
MM ESR-G 320-55-T21 NECK	32.00	55.80	T21	39.5	30.00	2	●	

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ESR-1.5D BLANKS

Interchangeable Solid Carbide Blank Heads

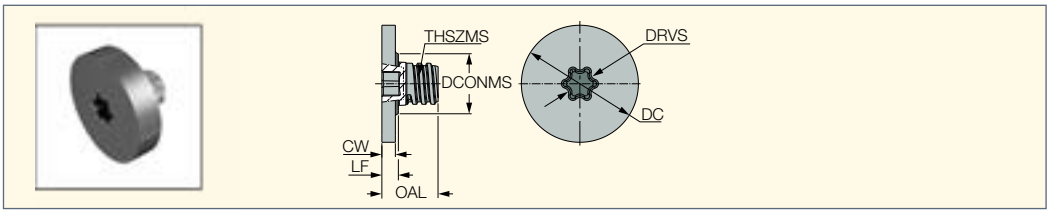


Designation	Dimensions DC	LF	THSZMS	IC08
MM ESR-G 080-18.0 T05 08	8.00	18.40	T05	•
MM ESR-G 100-22.0 T06	10.00	22.40	T06	•
MM ESR-G 120-27.0 T08 08	12.00	27.45	T08	•
MM ESR-G 160-33.5 T10	16.00	34.00	T10	•
MM ESR-G 200-41.0 T12	20.00	41.50	T12	•
MM ESR-G 250-52.5 T15	25.00	53.00	T15	•

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TC-G

Interchangeable Cemented Carbide Blank Heads



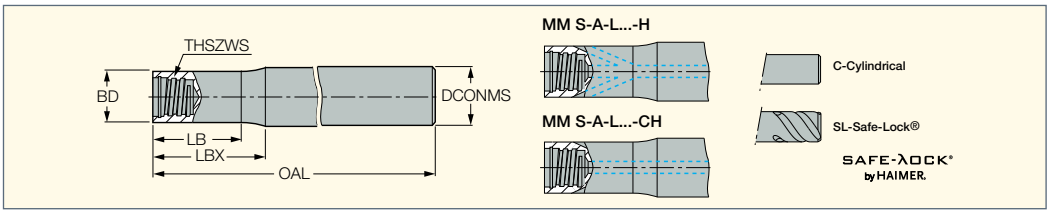
Designation	Dimensions DC	CW	LF	OAL	DCONMS	DRVS(1)	THSZMS	Tough ↔ Hard IC28	IC08
MM TC138N-19-G-T05	13.80	1.90	2.50	9.60	7.60	20.0	T05	•	
MM TC138N-23-G-T05	13.80	2.30	2.90	10.00	7.60	20.0	T05	•	
MM TC138N-28-G-T05	13.80	2.80	3.40	10.50	7.60	20.0	T05	•	
MM TC138N-35-G-T05	13.80	3.50	4.10	11.20	7.60	20.0	T05	•	
MM TC138N-43-G-T05	13.80	4.30	4.90	12.00	7.60	20.0	T05	•	
MM TC171N-19-G-T06	17.10	1.90	2.75	9.40	9.25	25.0	T06	•	
MM TC171N-23-G-T06	17.10	2.30	3.15	9.80	9.25	25.0	T06	•	
MM TC171N-33-G-T06	17.10	3.30	4.15	10.80	9.25	25.0	T06	•	
MM TC171N-43-G-T06	17.10	4.30	5.15	11.80	9.25	25.0	T06	•	
MM TC171N-50-G-T06	17.10	5.00	5.85	12.50	9.25	25.0	T06	•	
MM TC234N-27-G-T08	23.40	2.70	3.30	11.25	12.00	40.0	T08	•	
MM TC234N-42-G-T08	23.40	4.20	4.80	12.75	12.00	40.0	T08	•	
MM TC234N-53-G-T08	23.40	5.30	5.90	13.85	12.00	40.0	T08	•	
MM TC234N-66-G-T08	23.40	6.60	7.20	15.75	12.00	40.0	T08	•	
MM TC234N-82-G-T08	23.40	8.20	8.80	17.35	12.00	40.0	T08	•	
MM TC234N-99-G-T08	23.40	9.90	10.50	19.05	12.00	40.0	T08	•	
MM TC286N-28-G-T10	28.60	2.80	3.65	15.40	15.30	40.0	T10	•	
MM TC286N-36-G-T10	28.60	3.60	4.45	16.20	15.30	40.0	T10	•	
MM TC286N-46-G-T10	28.60	4.60	5.45	17.20	15.30	40.0	T10	•	
MM TC286N-56-G-T10	28.60	5.60	6.45	18.20	15.30	40.0	T10	•	•
MM TC286N-66-G-T10	28.60	6.60	7.45	19.20	15.30	40.0	T10	•	
MM TC286N-83-G-T10	28.60	8.30	9.15	20.90	15.30	40.0	T10	•	
MM TC286N-93-G-T10	28.60	9.30	10.15	21.90	15.30	40.0	T10	•	
MM TC286N-103-G-T10	28.60	10.30	11.15	22.90	15.30	40.0	T10	•	
MM TC356N-60-G-T12	35.60	6.00	6.55	20.35	18.30	50.0	T12	•	
MM TC356N-100-G-T12	35.60	10.00	10.55	24.35	18.30	50.0	T12	•	•
MM TC356N-120-G-T12	35.60	12.00	12.55	26.35	18.30	50.0	T12	•	
MM TC356N-160-G-T12	35.60	16.00	16.55	30.35	18.30	50.0	T12	•	

• For shanks, see pages 84-91 • For tightening torques and clamping instructions, see pages 91-92 • Do not apply lubricant to the threaded connection
• For user guide see pages 44, 177-184
(1) Torque key size

MULTI-MASTER

MM S-A (stepped shanks)

Stepped Cylindrical Shanks
Carrying Interchangeable
Milling Heads



Designation	THSZWS	DCONMS	BD	LB	LBX	OAL	Shank[3]	Shank m.[4]	CSP[5]	RPMX[6]	Kg
MM S-A-L050-C08-T04	T04	8.00	5.80	9.90	14.0	50.00	C	S	0	60000	0.02
MM S-A-L060/20-C08-T04-C	T04	8.00	5.80	16.90	20.0	60.00	C	C	0	60000	0.00
MM S-A-L060-C08-T05	T05	8.00	7.60	12.50	15.0	60.00	C	S	0	60000	0.02
MM S-A-L065/24-SL08T05C [1]	T05	8.00	7.60	24.00	25.6	65.00	SL	C	0	60000	0.04
MM S-A-L070-C08-T05-C	T05	8.00	7.60	18.60	20.0	70.00	C	C	0	60000	0.04
MM S-A-L070-C08-T05-W	T05	8.00	7.60	18.90	20.0	70.00	C	W	0	60000	0.06
MM S-A-L090-C08-T05-C	T05	8.00	7.60	38.60	40.0	90.00	C	C	0	50160	0.06
MM S-A-L090-C08-T05-W	T05	8.00	7.60	38.60	40.0	90.00	C	W	0	36090	0.07
MM S-A-L110-C08-T05-C	T05	8.00	7.60	57.90	60.0	110.00	C	C	0	30600	0.07
MM S-A-L110-C08-T05-W	T05	8.00	7.60	58.90	60.0	110.00	C	W	0	21060	0.09
MM S-A-L070-C10-T06-C	T06	10.00	9.60	18.50	20.0	70.00	C	C	0	54900	0.08
MM S-A-L070-C10-T06-W-H	T06	10.00	9.60	18.90	20.0	70.00	C	W	1	60000	0.08
MM S-A-L075-C10-T06	T06	10.00	9.60	17.40	20.0	75.00	C	S	0	60000	0.05
MM S-A-L075-C10-T06-H	T06	10.00	9.60	19.40	20.0	75.00	C	S	1	53940	0.04
MM S-A-L075/12-C10-T06-CH	T06	10.00	9.60	10.60	12.0	75.00	C	S	1	53940	0.04
MM S-A-L075/30-SL10T06C [1]	T06	10.00	9.60	30.00	31.7	75.00	SL	C	0	53940	0.08
MM S-A-L090-C10-T06-C	T06	10.00	9.60	38.50	40.0	90.00	C	C	0	55170	0.06
MM S-A-L090/040C10T06C-H	T06	10.00	9.60	38.60	40.0	90.00	C	C	1	60000	0.08
MM S-A-L090-C10-T06-W	T06	10.00	9.60	17.20	20.0	90.00	C	W	0	41670	0.12
MM S-A-L090-C10-T06-W-H	T06	10.00	9.60	39.00	40.0	90.00	C	W	1	40860	0.10
MM S-A-L110-C10-T06-C	T06	10.00	9.60	57.90	60.0	110.00	C	C	0	34530	0.11
MM S-A-L110-C10-T06-W-H	T06	10.00	9.60	59.00	60.0	110.00	C	W	1	24840	0.12
MM S-A-L150-C10-T06-C	T06	10.00	9.60	98.50	100.0	150.00	C	C	0	16620	0.00
MM S-A-L070-C12-T08-C	T08	12.00	11.60	17.90	20.0	70.00	C	C	0	60000	0.10
MM S-A-L070-C12-T08-W-H	T08	12.00	11.60	18.70	20.0	70.00	C	W	1	60000	0.11
MM S-A-L085/36-C12T08C [2]	T08	12.00	11.60	36.00	37.7	85.00	C	C	0	60000	0.13
MM S-A-L090/14-C12-T08-CH	T08	12.00	11.60	13.00	14.0	90.00	C	S	1	43000	0.08
MM S-A-L090-C12-T08	T08	12.00	11.60	13.30	16.0	90.00	C	S	0	43000	0.08
MM S-A-L070/020C12T08C-CH	T08	12.00	11.60	18.00	20.0	70.00	C	C	1	43050	0.08
MM S-A-L090-C12-T08-C	T08	12.00	11.60	39.00	40.0	90.00	C	C	0	43050	0.12
MM S-A-L090-C12-T08-H	T08	12.00	11.60	38.70	40.0	90.00	C	S	1	41040	0.08
MM S-A-L090-C12-T08-W-H	T08	12.00	11.60	38.70	40.0	90.00	C	W	1	49800	0.15
MM S-A-L090/040C12T08C-CH	T08	12.00	11.50	38.00	40.0	90.00	C	C	1	49800	0.11
MM S-A-L090/42-C12-T08-CH	T08	12.00	11.60	41.00	42.0	90.00	C	S	1	41010	0.08
MM S-A-L110-C12-T08-W	T08	12.00	11.60	17.00	20.0	110.00	C	W	0	31350	0.20
MM S-A-L110-C12-T08-C	T08	12.00	11.60	57.00	60.0	110.00	C	C	0	41040	0.16
MM S-A-L110-C12-T08-W-H	T08	12.00	11.60	58.70	60.0	110.00	C	W	1	30210	0.18
MM S-A-L110/060C12T08C-CH	T08	12.00	11.50	58.00	60.0	110.00	C	C	1	30210	0.12
MM S-A-L130-C12-T08-C	T08	12.00	11.60	78.60	80.0	130.00	C	C	0	27960	0.19
MM S-A-L130-C12-T08-W-H	T08	12.00	11.60	78.70	80.0	130.00	C	W	1	20100	0.21
MM S-A-L130/080C12T08C-CH	T08	12.00	11.50	78.00	80.0	130.00	C	C	1	20100	0.17
MM S-A-L070-C16-T10-W-H	T10	16.00	15.30	18.20	20.0	70.00	C	W	1	60000	0.21
MM S-A-L090-C16-T10-C	T10	16.00	15.30	38.00	40.0	90.00	C	C	0	60000	0.21
MM S-A-L090-C16-T10-W-H	T10	16.00	15.30	38.20	40.0	90.00	C	W	1	57510	0.27
MM S-A-L090/040C16T10C-CH	T10	16.00	15.30	38.00	40.0	90.00	C	C	1	57510	0.17
MM S-A-L100-C16-T10	T10	16.00	15.30	16.30	20.0	100.00	C	S	0	39000	0.15
MM S-A-L100-C16-T10-H	T10	16.00	15.30	48.00	50.0	100.00	C	S	1	37140	0.13
MM S-A-L100/20-C16-T10-CH	T10	16.00	15.30	18.00	20.0	100.00	C	S	1	37140	0.12
MM S-A-L100/42-C16-T10-CH	T10	16.00	15.30	40.20	42.0	100.00	C	S	1	38040	0.14
MM S-A-L100/48-C16T10C [2]	T10	16.00	15.30	48.00	50.3	100.00	C	C	0	38040	0.06
MM S-A-L110-C16-T10-C	T10	16.00	15.30	58.00	60.0	110.00	C	C	0	47010	0.27
MM S-A-L110-C16-T10-W-H	T10	16.00	15.30	58.20	60.0	110.00	C	W	1	36030	0.33
MM S-A-L110/060C16T10C-H	T10	16.00	15.00	58.10	60.0	110.00	C	C	1	60000	0.00
MM S-A-L110/060C16T10C-CH	T10	16.00	15.30	58.00	60.0	110.00	C	C	1	36030	0.17
MM S-A-L130-C16-T10-C	T10	16.00	15.30	77.40	80.0	130.00	C	C	0	33510	0.32
MM S-A-L130-C16-T10-W-H	T10	16.00	15.30	78.20	80.0	130.00	C	W	1	24450	0.41
MM S-A-L130/080C16T10C-CH	T10	16.00	15.30	78.00	80.0	130.00	C	C	1	24450	0.32
MM S-A-L150-C16-T10-C	T10	16.00	15.30	97.40	100.0	150.00	C	C	0	24660	0.37

- Do not apply lubricant to the threaded connection.

[1] SL-Safe-Lock® (by Haimer) helical grooves that prevent pull-out(available upon request).

[2] With Safe-Lock® (by Haimer) pull-out prevention helical grooves

[3] C-Cylindrical, SL-Safe-Lock® (by Haimer)

[4] S-steel, C-carbide, W-tungsten

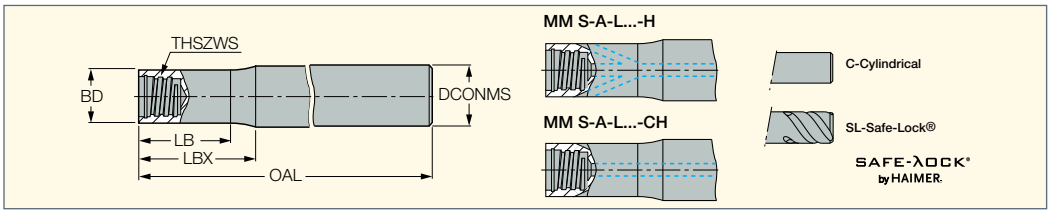
[5] 0 - Without coolant supply, 1 - With coolant supply

[6] The maximum RPM must be calculated. Divide the listed max. RPM by the number of flutes (on the milling head) being used.

MULTI-MASTER

MM S-A (stepped shanks) (Continue)

Stepped Cylindrical Shanks Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	LB	LBX	OAL	Shank[3]	Shank m.[4]	CSP[5]	RPMX[6]	Kg
MM S-A-L150-C16-T10-W-H	T10	16.00	15.30	98.20	100.0	150.00	C	W	1	17610	0.45
MM S-A-L090-C20-T12-C	T12	20.00	18.30	37.00	40.0	90.00	C	C	0	60000	0.27
MM S-A-L090-C20-T12-W-H	T12	20.00	18.30	36.90	40.0	90.00	C	W	1	60000	0.41
MM S-A-L090/040C20T12C-CH	T12	20.00	18.30	37.20	40.0	90.00	C	C	1	60000	0.30
MM S-A-L110/50-SL20T12C [1]	T12	20.00	18.30	50.00	53.3	110.00	SL	C	0	60000	0.08
MM S-A-L120-C20-T12	T12	20.00	18.30	20.30	25.0	120.00	C	S	0	36000	0.27
MM S-A-L120-C20-T12-H	T12	20.00	18.30	66.70	70.0	120.00	C	S	1	32160	0.25
MM S-A-L120/25-C20-T12-CH	T12	20.00	18.30	22.20	25.0	120.00	C	S	1	32160	0.12
MM S-A-L120/48-C20-T12-CH	T12	20.00	18.30	45.20	48.0	120.00	C	S	1	32160	0.20
MM S-A-L130-C20-T12-C	T12	20.00	18.30	77.20	80.0	130.00	C	C	0	42360	0.47
MM S-A-L130-C20-T12-W-H	T12	20.00	18.30	76.90	80.0	130.00	C	W	1	31650	0.59
MM S-A-L130/080C20T12C-CH	T12	20.00	18.30	77.20	80.0	130.00	C	C	1	42360	0.44
MM S-A-L170-C20-T12-C	T12	20.00	18.30	97.20	100.0	170.00	C	C	0	25170	0.63
MM S-A-L200-C20-T12-C	T12	20.00	18.30	116.50	120.0	200.00	C	C	0	17790	0.76
MM S-A-L200-C20-T12-W-H	T12	20.00	18.30	116.90	120.0	200.00	C	W	1	12540	0.92
MM S-A-L200/120C20T12C-CH	T12	20.00	18.30	117.20	120.0	200.00	C	C	1	17790	0.74
MM S-A-L120-C25-T15-C	T15	25.00	23.90	57.50	60.0	120.00	C	C	0	49400	0.64
MM S-A-L120-C25-T15-W-H	T15	25.00	23.90	58.00	60.0	120.00	C	W	1	41700	0.89
MM S-A-L125/63-C25T15C [2]	T15	25.00	24.00	63.00	65.8	125.00	C	C	0	41700	0.75
MM S-A-L135-C25-T15	T15	25.00	23.90	33.00	35.0	135.00	C	S	0	28290	0.47
MM S-A-L135/35-C25-T15-CH	T15	25.00	23.90	33.00	35.0	135.00	C	S	1	28230	0.42
MM S-A-L135/50-C25-T15-CH	T15	25.00	23.90	47.70	50.0	135.00	C	S	1	28230	0.40
MM S-A-L170-C25-T15-C	T15	25.00	23.90	98.00	100.0	170.00	C	C	0	27360	0.96
MM S-A-L175-C25-T15	T15	25.00	23.90	62.70	65.0	175.00	C	S	0	16890	0.10
MM S-A-L250-C25-T15-C	T15	25.00	23.90	148.00	150.0	250.00	C	C	0	12690	1.45
MM S-A-L100/32-C32-T21	T21	32.00	30.00	32.00	35.3	100.00	C	S	0	12690	0.56
MM S-A-L130/60-C32-T21-C	T21	32.00	30.00	60.00	63.3	130.00	C	C	0	12690	1.22
MM S-A-L135/64-C32T21C	T21	32.00	30.00	64.00	67.5	135.00	C	C	0	12690	1.02
MM S-A-L150/50-C32-T21	T21	32.00	30.00	50.00	53.5	150.00	C	S	0	12690	0.86
MM S-A-L170/100-C32-T21-C	T21	32.00	30.00	100.00	103.5	170.00	C	C	0	12690	1.22
MM S-A-L250/150-C32-T21-C	T21	32.00	30.00	150.00	153.5	250.00	C	C	0	12690	2.50
MM S-A-L300/200-C32-T21-C	T21	32.00	30.00	200.00	203.5	300.00	C	C	0	12690	3.00

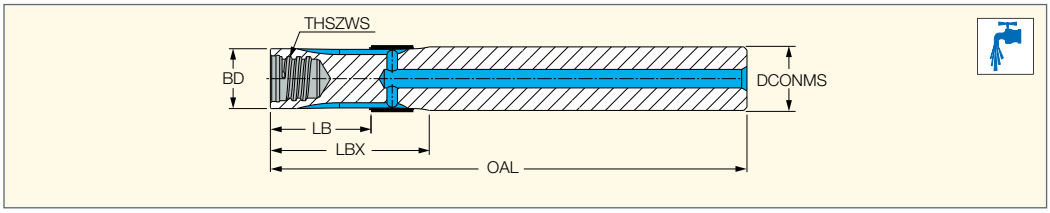
- Do not apply lubricant to the threaded connection.

[1] SL-Safe-Lock® (by Haimer) helical grooves that prevent pull-out(available upon request).
[2] With Safe-Lock® (by Haimer) pull-out prevention helical grooves
[3] C-Cylindrical, SL-Safe-Lock® (by Haimer)
[4] S-steel, C-carbide, W-tungsten
[5] 0 - Without coolant supply, 1 - With coolant supply
[6] The maximum RPM must be calculated. Divide the listed max. RPM by the number of flutes (on the milling head) being used.

MULTI-MASTER

MM S-A-N

Stepped Cylindrical Shanks with Parallel Directed Coolant Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	LB	LBX	OAL	Shank m.[1]	kg
MM S-A-L075-C10-T06-N	T06	10.00	9.60	18.00	28.0	75.00	S	0.04
MM S-A-L090-C12-T08-N	T08	12.00	11.60	18.00	30.0	90.00	S	0.07
MM S-A-L100-C16-T10-N	T10	16.00	15.30	23.00	35.0	100.00	S	0.04

- Do not apply lubricant to the threaded connection

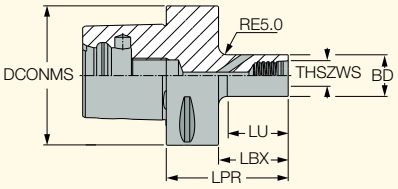
[1] S-steel

MULTI-MASTER

CAMFIX

MM S-A-C#

MULTI-MASTER Threaded Connection Shanks with a CAMFIX (ISO 26623-1) Exchangeable Adaptation



Designation	DCONMS	THSZWS	BD	LPR	LBX	LU	CDI[1]	kg
MM S-A-H035-C3-T05	32.00	T05	7.60	35.00	20.0	15.00	0	0.00
MM S-A-H035-C3-T06	32.00	T06	9.25	35.00	20.0	15.00	0	0.12
MM S-A-H040-C3-T08	32.00	T08	11.60	40.00	25.0	20.00	0	0.13
MM S-A-H040-C3-T10	32.00	T10	15.30	40.00	25.0	20.00	0	0.15
MM S-A-H045-C3-T12	32.00	T12	18.30	45.00	30.0	25.00	0	0.16
MM S-A-H045-C4-T06	40.00	T06	9.25	45.00	25.0	20.00	0	0.00
MM S-A-H045-C4-T08	40.00	T08	11.60	45.00	25.0	20.00	0	0.00
MM S-A-H050-C4-T10	40.00	T10	15.30	50.00	30.0	25.00	0	0.00
MM S-A-H055-C4-T12	40.00	T12	18.30	55.00	35.0	30.00	0	0.00
MM S-A-H055-C4-T15	40.00	T15	23.90	55.00	35.0	30.00	0	0.35
MM S-A-H060-C5-T10	50.00	T10	15.30	60.00	40.0	35.00	0	0.00
MM S-A-H060-C5-T12	50.00	T12	18.30	60.00	40.0	35.00	0	0.48
MM S-A-H060-C5-T15	50.00	T15	23.90	60.00	40.0	35.00	0	0.58
MM S-A-H065-C6-T12	63.00	T12	18.30	65.00	43.0	38.00	0	0.00
MM S-A-H065-C6-T15	63.00	T15	23.90	65.00	43.0	38.00	0	0.00
MM S-A-H070-C8-T15	80.00	T15	23.90	70.00	40.0	35.00	0	0.00

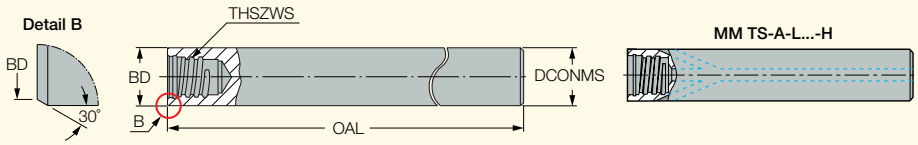
• Do not apply lubricant to the threaded connection • For adaptation options, see page 44

[1] 1 - Hole for data chip, 0 - Without hole for data chip

MULTI-MASTER

MM TS-A

Cylindrical Shanks Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	OAL	Shank m.[1]	RPMX[2]	CSP[3]	kg
MM TS-A-L070-C08-T04	T04	8.00	5.80	70.00	S	-	0	0.00
MM TS-A-L070-C08-T05	T05	8.00	7.60	70.00	S	60000	0	0.03
MM TS-A-L080-C10-T06	T06	10.00	9.60	80.00	S	47400	0	0.05
MM TS-A-L080-C10-T06-H	T06	10.00	9.60	80.00	S	46920	1	0.04
MM TS-A-L090-C12-T08	T08	12.00	11.60	90.00	S	43110	0	0.08
MM TS-A-L090-C12-T08-H	T08	12.00	11.60	90.00	S	42780	1	0.08
MM TS-A-L100-C16-T10	T10	16.00	15.30	100.00	S	39420	0	0.16
MM TS-A-L100-C16-T10-H	T10	16.00	15.30	100.00	S	39210	1	0.14

• Do not apply lubricant to the threaded connection

[1] S-steel, C-carbide

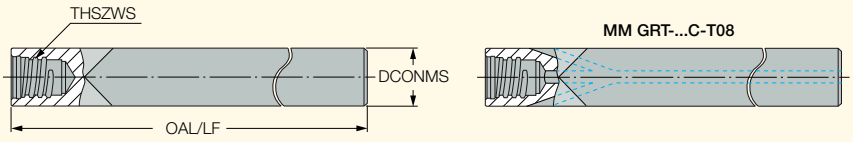
[2] The actual maximum RPM should be calculated by dividing the listed RPM max by the number of the head's flutes being used.

[3] 0 - Without coolant supply, 1 - With coolant supply

MULTI-MASTER

MM GRT (shanks)

Solid Carbide Cylindrical Shanks Carrying Slitting and Grooving Interchangeable Milling Heads



Designation	THSZWS	DCONMS	OAL	Shank m.[1]	CSP[2]	kg
MM GRT-095-T06	T06	9.52	80.00	C	0	0.07
MM GRT-100-T06	T06	10.00	100.00	C	0	0.10
MM GRT-120C-T08	T08	12.00	100.00	C	1	0.12
MM GRT-127C-T08	T08	12.70	120.00	C	1	0.17

• MM GRT... shanks serve mainly for MM GRIT... slitting heads. When mounting other types of milling heads, do not exceed maximum specified depth of cut for the particular milling head. Since the shank diameter is not relieved, it may touch a wall on the workpiece being machined.

• Use carbide shanks for groove milling heads and for applications requiring high rigidity and precision.

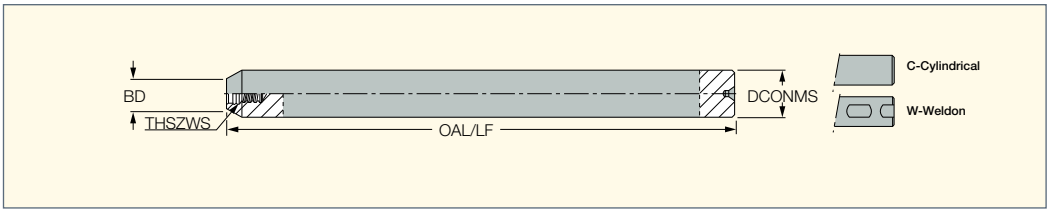
[1] C - Solid carbide

[2] 0 - Without coolant supply, 1 - With coolant supply

MULTI-MASTER

MM S-A (straight shanks)

Shanks Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	OAL	Shank[2]	Shank m.[3]	RPMX[4]	kg
MM S-A-L055-W12-T05	T05	12.00	7.60	55.00	W	S	60000	0.05
MM S-A-L070-C20T05	T05	20.00	7.60	70.00	C	S	60000	0.24
MM S-A-L150-C12-T05-B [1]	T05	12.00	7.60	150.00	C	S	18270	0.13
MM S-A-L065-W16-T06	T06	16.00	9.60	65.00	W	S	60000	0.09
MM S-A-L080-C25T06	T06	25.00	9.60	80.00	C	S	60000	0.29
MM S-A-L200-C16-T06-B [1]	T06	16.00	9.60	200.00	C	S	11970	0.33
MM S-A-L065-W16-T08	T08	16.00	11.60	65.00	W	S	60000	0.10
MM S-A-L080-C25T08	T08	25.00	11.60	80.00	C	S	60000	0.40
MM S-A-L250-C20-T08-B [1]	T08	20.00	11.60	250.00	C	S	9330	0.60
MM S-A-L070-W20-T10	T10	20.00	15.30	70.00	W	S	60000	0.17
MM S-A-L080-C32T10	T10	32.00	15.30	80.00	C	S	60000	0.65
MM S-A-L250-C25-T10-B [1]	T10	25.00	15.30	250.00	C	S	11130	0.94
MM S-A-L075-W25-T12	T12	25.00	18.30	75.00	W	S	60000	0.28
MM S-A-L080-C32T12	T12	32.00	18.30	80.00	C	S	60000	0.65
MM S-A-L100-W32-T15	T15	32.00	23.90	100.00	W	S	60000	0.30
MM S-A-L100-C40T15	T15	40.00	23.90	100.00	C	S	60000	0.94
MM S-A-L100-C40T21	T21	40.00	30.00	100.00	C	S	60000	1.56

- Do not apply lubricant to the threaded connection.

[1] "B" suffix - cylindrical shank which may be shortened.

[2] C-Cylindrical, W-Weldon

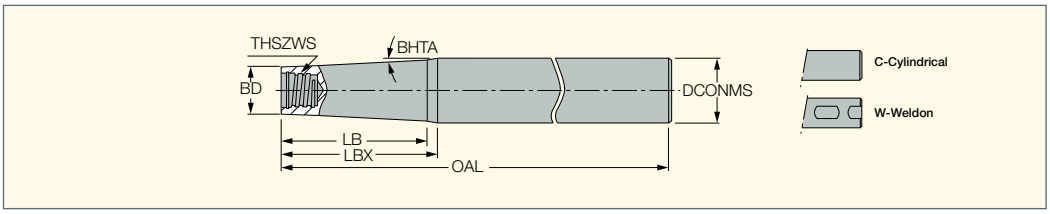
[3] S-steel

[4] The maximum RPM must be calculated. Divide the listed max. RPM by the number of flutes (on the milling head) being used.

MULTI-MASTER

MM S-B (85° conical shanks)

Shanks Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	BHTA	Shank[1]	LB	LBX	OAL	Shank m.[2]	RPMX[3]	kg
MM S-B-L080/24-C08-T04	T04	8.00	5.80	2.6	C	-	24.0	80.00	S	60000	0.00
MM S-B-L080-C12-T05	T05	12.00	7.60	5.0	C	-	25.0	80.00	S	60000	0.06
MM S-B-L085/32-C16T05	T05	16.00	7.60	5.0	C	27.00	32.0	85.00	S	41280	0.11
MM S-B-L125-C16-T06	T06	16.00	9.60	5.0	C	31.50	31.7	125.00	S	41280	0.19
MM S-B-L095/40-C20T06	T06	20.00	9.60	5.0	C	34.00	40.0	95.00	S	41280	0.19
MM S-B-L140-C20-T06-W	T06	20.00	9.65	5.0	C	-	60.3	140.50	W	51180	0.62
MM S-B-L140-C16-T08	T08	16.00	11.60	5.0	C	19.30	22.0	140.00	S	25590	0.22
MM S-B-L100/48-C20T08	T08	20.00	11.60	5.0	C	-	48.0	100.00	S	25590	0.32
MM S-B-L140-C20-T10	T10	20.00	15.30	5.0	C	-	27.0	140.00	S	31020	0.34
MM S-B-L170-C25-T10	T10	25.00	15.30	5.0	C	-	56.0	170.00	S	29490	0.16
MM S-B-L120/55-C25T10	T10	25.00	15.30	5.0	C	-	55.4	120.00	S	29490	0.40
MM S-B-L160-C25-T12	T12	25.00	18.30	5.0	C	-	40.0	160.00	S	28680	0.11
MM S-B-L190-C32-T12	T12	32.00	18.30	5.0	C	-	80.0	190.00	S	34890	0.56
MM S-B-L150/78-C32T12	T12	32.00	18.30	5.0	C	-	78.3	150.00	S	34890	0.78
MM S-B-L200-C32-T15	T15	32.00	23.90	5.0	C	-	50.0	200.00	S	14160	1.19
MM S-B-L180/92-C40T15	T15	40.00	23.90	5.0	C	-	92.0	180.00	S	14160	0.28
MM S-B-L250-W40-T15	T15	40.00	23.90	5.0	W	-	100.0	250.00	S	21840	2.12
MM S-B-L150/57-C40T21	T21	40.00	30.00	5.0	C	-	57.0	150.00	S	21840	0.62

- Do not apply lubricant to the threaded connection.

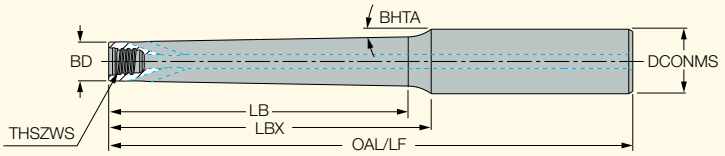
[1] C-Cylindrical, W-Weldon

[2] S-steel, W-tungsten

[3] The maximum RPM must be calculated. Divide the listed max. RPM by the number of flutes (on the milling head) being used.

MULTI-MASTER

MM S-D
(89° conical shanks)
Shanks Carrying Interchangeable Milling Heads



Designation	THSZWS	DCONMS	BD	LB	Shank	LBX	OAL	BHTA	Shank m.	CSP(1)	RPMX(2)	kg
MM S-D-L100-C12-T05	T05	12.00	7.60	29.60	C	35.0	100.00	1.0	S	0	52000	0.08
MM S-D-L110-C12-T05-C	T05	12.00	7.60	55.90	C	60.0	110.00	1.0	C	0	53430	0.13
MM S-D-L110-C12-T05-W-H	T05	12.00	7.60	55.70	C	60.0	110.00	1.0	W	1	38460	0.14
MM S-D-L130-C12-T05-C	T05	12.00	7.60	77.30	C	80.0	130.00	1.0	C	0	36420	0.15
MM S-D-L130-C12-T05-W-H	T05	12.00	7.60	76.40	C	80.0	130.00	1.0	W	1	26160	0.16
MM S-D-L150-C16-T05-C	T05	16.00	7.60	91.50	C	100.0	150.00	1.0	C	0	29700	0.00
MM S-D-L110-C12-T06-W-H	T06	12.00	9.60	58.80	C	60.0	110.00	1.0	W	1	36990	0.17
MM S-D-L130-C16-T06-W-H	T06	16.00	9.60	73.40	C	80.0	130.00	1.0	W	1	29490	0.28
MM S-D-L150-C16-T06-C	T06	16.00	9.60	95.40	C	100.0	150.00	1.0	C	0	30150	0.27
MM S-D-L150-C16-T06-W-H	T06	16.00	9.60	93.80	C	100.0	150.00	1.0	W	1	21660	0.33
MM S-D-L160-C16-T06	T06	16.00	9.60	46.80	C	55.0	160.00	1.0	S	0	23370	0.12
MM S-D-L170-C16-T06-C	T06	16.00	9.60	116.90	C	120.0	170.00	1.0	C	0	23400	0.11
MM S-D-L170-C16-T06-W	T06	16.00	9.60	46.30	C	55.0	170.00	1.0	W	0	21210	0.48
MM S-D-L130-C16-T08-C	T08	16.00	11.60	77.20	C	80.0	130.00	1.0	C	0	39870	0.28
MM S-D-L130-C16-T08-W-H	T08	16.00	11.60	76.40	C	80.0	130.00	1.0	W	1	29040	0.32
MM S-D-L150-C16-T08-C	T08	16.00	11.60	97.80	C	100.0	150.00	1.0	C	0	29970	0.33
MM S-D-L150-C16-T08-W-H	T08	16.00	11.60	98.30	C	100.0	150.00	1.0	W	1	21540	0.38
MM S-D-L170-C20-T08	T08	20.00	11.60	69.70	C	80.0	170.00	1.0	S	0	22680	0.30
MM S-D-L170-C20-T08-C	T08	20.00	11.60	112.00	C	120.0	170.00	1.0	C	0	26250	0.47
MM S-D-L170-C20-T08-W	T08	20.00	11.60	69.70	C	80.0	170.00	1.0	W	0	24900	0.65
MM S-D-L170-C20-T08-W-H	T08	20.00	11.60	113.10	C	120.0	170.00	1.0	W	1	18750	0.53
MM S-D-L150-C20-T10-C	T10	20.00	15.30	97.50	C	120.0	150.00	1.0	C	0	35610	0.10
MM S-D-L150-C20-T10-W-H	T10	20.00	15.30	96.80	C	100.0	150.00	1.0	W	1	25800	0.60
MM S-D-L170-C20-T10-C	T10	20.00	15.30	118.30	C	120.0	170.00	1.0	C	0	28140	0.61
MM S-D-L170-C20-T10-W-H	T10	20.00	15.30	118.00	C	120.0	170.00	1.0	W	1	20100	0.73
MM S-D-L190-C20-T10	T10	20.00	15.30	73.70	C	80.0	190.00	1.0	S	0	15780	0.42
MM S-D-L190-C20-T10-C	T10	20.00	15.30	-	C	140.0	190.00	1.0	C	0	22830	0.68
MM S-D-L190-C20-T10-W-H	T10	20.00	15.30	-	C	140.0	190.00	1.0	W	1	16170	0.83
MM S-D-L210-C20-T10-C	T10	20.00	15.30	-	C	160.0	210.00	1.0	C	0	18270	0.75
MM S-D-L210-C20-T10-W-H	T10	20.00	15.30	-	C	160.0	210.00	1.0	W	1	12870	0.93
MM S-D-L180-C25-T12-C	T12	25.00	18.30	115.70	C	120.0	180.00	1.0	C	0	29460	0.91
MM S-D-L180-C25-T12-W-H	T12	25.00	18.30	114.60	C	120.0	180.00	1.0	W	1	20940	1.15
MM S-D-L200-C25-T12-W-H	T12	25.00	18.30	146.60	C	150.0	200.00	1.0	W	1	16560	1.21
MM S-D-L210-C25-T12	T12	25.00	18.30	94.60	C	100.0	210.00	1.0	S	0	15540	0.66
MM S-D-L250-C25-T12-C	T12	25.00	18.30	135.60	C	140.0	250.00	1.0	C	0	16170	1.40
MM S-D-L250-C25-160T12W-H	T12	25.00	18.30	157.20	C	160.0	250.00	1.0	W	1	11310	1.76
MM S-D-L250-C25-T12-W-H	T12	25.00	18.30	135.60	C	140.0	250.00	1.0	W	1	11300	1.80
MM S-D-L250-C32-T15	T15	32.00	23.90	90.10	C	100.0	250.00	1.0	S	0	14160	1.00
MM S-D-L250-C32-T15-C	T15	32.00	23.90	143.30	C	150.0	250.00	1.0	C	0	20370	1.88
MM S-D-L300-C32-T15-C	T15	32.00	23.90	195.70	C	200.0	300.00	1.0	C	0	16000	2.62

• Shank material (Shank m.): S-steel, C-carbide, W-tungsten. • Do not apply lubricant to the threaded connection.

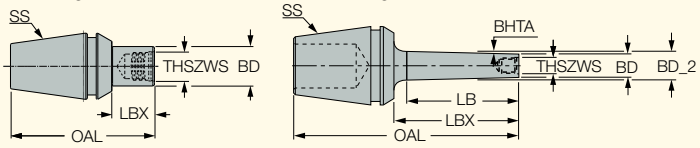
(1) 0 - Without coolant supply, 1 - With coolant supply

(2) The maximum RPM must be calculated. Divide the listed max. RPM by the number of flutes (on the milling head) being used.

MULTI-MASTER

MM S-ER

Shanks Carrying MULTI-MASTER Solid Carbide Heads with an ER Collet Adaptation



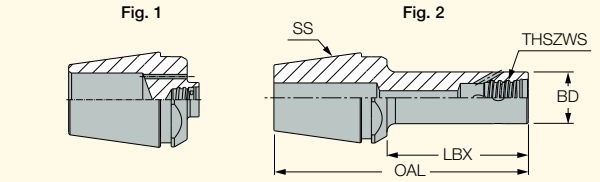
Designation	SS	THSZWS	BHTA	BD	BD_2	LB	LBX	OAL	Fig.	kg
MM S-A-H004-ER11-T04	ER11	T04	-	5.80	-	-	4.0	22.00	1.	0.00
MM S-A-H004-ER11-T05	ER11	T05	-	7.60	-	-	4.0	22.00	1.	0.01
MM S-A-H10.5-ER11-T05	ER11	T05	-	7.60	-	-	10.5	28.50	1.	0.01
MM S-A-H004-ER16-T05	ER16	T05	-	7.60	-	-	4.0	31.50	1.	0.03
MM S-A-H004-ER16-T06	ER16	T06	-	9.25	-	-	4.0	31.50	1.	0.03
MM S-A-H004-ER16-T08	ER16	T08	-	11.60	-	-	4.0	31.50	1.	0.04
MM S-A-H10.5-ER16-T05	ER16	T05	-	7.60	-	-	10.5	38.00	1.	0.04
MM S-A-H10.5-ER16-T06	ER16	T06	-	9.25	-	-	10.5	38.00	1.	0.04
MM S-A-H013-ER16-T08	ER16	T08	-	11.60	-	-	14.0	40.50	1.	0.02
MM S-A-H004-ER20-T05	ER20	T05	-	7.60	-	-	4.0	35.50	1.	0.06
MM S-A-H004-ER20-T06	ER20	T06	-	9.25	-	-	4.0	35.50	1.	0.06
MM S-A-H004-ER20-T08	ER20	T08	-	11.60	-	-	4.0	35.50	1.	0.07
MM S-A-H004-ER20-T10	ER20	T10	-	15.30	-	-	4.0	35.50	1.	0.06
MM S-A-H10.5-ER20-T05	ER20	T05	-	7.60	-	-	10.5	42.00	1.	0.06
MM S-A-H10.5-ER20-T06	ER20	T06	-	9.25	-	-	10.5	42.00	1.	0.06
MM S-A-H013-ER20-T08	ER20	T08	-	11.60	-	-	13.0	44.50	1.	0.07
MM S-A-H016-ER20-T10	ER20	T10	-	15.30	-	-	16.0	47.50	1.	0.07
MM S-A-H004-ER25-T05	ER25	T05	-	7.60	-	-	4.0	38.00	1.	0.10
MM S-A-H10.5-ER25-T05	ER25	T05	-	7.60	-	-	10.5	44.50	1	0.10
MM S-A-H004-ER25-T06	ER25	T06	-	9.25	-	-	4.0	38.00	1.	0.07
MM S-A-H10.5-ER25-T06	ER25	T06	-	9.25	-	-	10.5	44.50	1.	0.12
MM S-A-H004-ER25-T08	ER25	T08	-	11.60	-	-	4.0	38.00	1.	0.11
MM S-A-H10.5-ER25-T08	ER25	T08	-	11.60	-	-	10.5	44.50	1.	0.06
MM S-A-H004-ER25-T10	ER25	T10	-	15.30	-	-	4.0	38.00	1.	0.10
MM S-A-H10.5-ER25-T10	ER25	T10	-	15.30	-	-	10.5	44.50	1.	0.10
MM S-A-H004-ER25-T12	ER25	T12	-	18.30	-	-	4.0	38.00	1.	0.10
MM S-A-H10.5-ER25-T12	ER25	T12	-	18.30	-	-	10.5	44.50	1.	0.06
MM S-A-H025-ER32-T06	ER32	T06	-	9.25	10.00	18.00	25.0	65.00	2.	0.15
MM S-B-H025-ER32-T06	ER32	T06	5.0	9.60	13.50	22.30	25.0	65.00	2.	0.16
MM S-B-H050-ER32-T06	ER32	T06	5.0	9.60	17.90	47.30	50.0	90.00	2.	0.20
MM S-B-H075-ER32-T06	ER32	T06	5.0	9.60	22.60	74.10	75.0	115.00	2.	0.25
MM S-D-H050-ER32-T06	ER32	T06	1.0	9.60	11.20	45.00	50.0	90.00	2.	0.17

• Do not apply lubricant to the threaded connection. • For adaptation see page 44 • When a rigid ER collet is assembled in an ER holder, the actual protruding length of the holder becomes shorter by 2.0 mm for ER20 and by 3.0 mm for ER25/ER32

MULTI-MASTER

MM S-ER-H

Shanks Carrying MULTI-MASTER Solid Carbide Heads with an ER Collet Adaptation and Coolant Holes



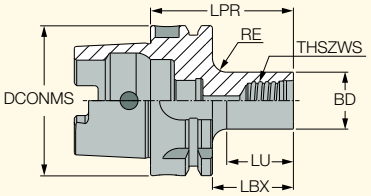
Designation	SS	THSZWS	BD	LBX	OAL	Fig.	kg
MM S-A-H004-ER32-T05-H	ER32	T05	7.60	4.0	44.00	1	0.14
MM S-A-H025-ER32-T05-H	ER32	T05	7.60	25.0	65.00	2	0.20
MM S-A-H040-ER32-T05-H	ER32	T05	7.60	40.0	80.00	2	0.23
MM S-A-H004-ER32-T06-H	ER32	T06	9.60	4.0	44.00	1	0.14
MM S-A-H025-ER32-T06-H	ER32	T06	9.25	25.0	65.00	2	0.20
MM S-A-H040-ER32-T06-H	ER32	T06	9.25	40.0	80.00	2	0.22
MM S-A-H004-ER32-T08-H	ER32	T08	11.60	4.0	44.00	1	0.14
MM S-A-H025-ER32-T08-H	ER32	T08	11.60	25.0	65.00	2	0.20
MM S-A-H050-ER32-T08-H	ER32	T08	11.60	50.0	90.00	2	0.23
MM S-A-H004-ER32-T10-H	ER32	T10	15.30	4.0	44.00	1	0.14
MM S-A-H025-ER32-T10-H	ER32	T10	15.30	25.0	65.00	2	0.20
MM S-A-H050-ER32-T10-H	ER32	T10	15.20	50.0	90.00	2	0.25
MM S-A-H004-ER32-T12-H	ER32	T12	18.30	4.0	44.00	1	0.14
MM S-A-H025-ER32-T12-H	ER32	T12	18.30	25.0	65.00	2	0.22
MM S-A-H050-ER32-T12-H	ER32	T12	18.30	50.0	90.00	2	0.22
MM S-A-H004-ER32-T15-H	ER32	T15	23.90	4.0	44.00	1	0.15
MM S-A-H025-ER32-T15-H	ER32	T15	23.90	25.0	65.00	2	0.21
MM S-A-H050-ER32-T15-H	ER32	T15	23.90	50.0	90.00	2	0.25

• Do not apply lubricant to the threaded connection. • For adaptation see page 44

MULTI-MASTER HSK

MM S-A-HSK

MULTI-MASTER Threaded Connection Shanks with an Integral HSK DIN 69893 Form A Tapered Adaptation



Designation	DCONMS	THSZWS	BD	LPR	LBX	LU	RE	CDI[1]	kg
MM S-A-H035-HSK A40-T05	40.00	T05	7.60	35.00	15.0	10.00	5.0	1	0.00
MM S-A-H040-HSK A40-T06	40.00	T06	9.25	40.00	20.0	15.00	5.0	1	0.28
MM S-A-H045-HSK A40-T08	40.00	T08	11.60	45.00	25.0	20.00	5.0	1	0.24
MM S-A-H050-HSK A40-T10	40.00	T10	15.30	50.00	30.0	25.00	5.0	1	0.23
MM S-A-H050-HSK A40-T12	40.00	T12	18.30	50.00	30.0	25.00	5.0	1	0.27
MM S-A-H050-HSK A63-T06	63.00	T06	9.25	50.00	24.0	18.00	6.0	1	0.70
MM S-A-H050-HSK A63-T08	63.00	T08	11.60	50.00	24.0	18.00	6.0	1	0.72
MM S-A-H055-HSK A63-T10	63.00	T10	15.30	55.00	29.0	23.00	6.0	1	0.73
MM S-A-H055-HSK A63-T12	63.00	T12	18.30	55.00	29.0	23.00	6.0	1	0.40
MM S-A-H060-HSK A63-T15	63.00	T15	23.90	60.00	34.0	28.00	6.0	1	0.76

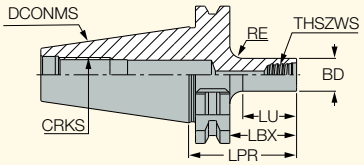
• Do not apply lubricant to the threaded connection • For adaptation options, see page 44

(1) 1 - Hole for data chip, 0 - Without hole for data chip

MULTI-MASTER DIN69871

MM S-A-SK

DIN 69871 Integral Tapered Shanks Carrying MULTI-MASTER Milling Heads



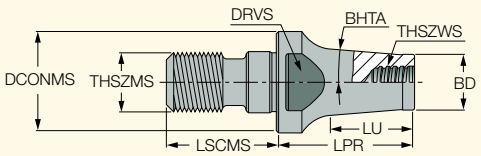
Designation	DCONMS	CRKS	THSZWS	BD	LPR	LBX	LU	RE	kg
MM S-A-H040-SK 40-T06	40.00	M16	T06	9.25	40.00	21.0	15.00	6.0	0.86
MM S-A-H045-SK 40-T08	40.00	M16	T08	11.60	45.00	26.0	20.00	6.0	0.87
MM S-A-H050-SK 40-T10	40.00	M16	T10	15.30	50.00	31.0	25.00	6.0	0.88
MM S-A-H050-SK 40-T12	40.00	M16	T12	18.30	50.00	31.0	25.00	6.0	0.90
MM S-A-H050-SK 40-T15	40.00	M16	T15	23.90	50.00	31.0	25.00	6.0	0.93

• Do not apply lubricant to the threaded connection • For adaptation, see page 44

FLEXFIT MULTI-MASTER

MM CAB

Adapters for Connecting FLEXFIT Shanks and MULTI-MASTER Milling Heads



Designation	THSZWS	THSZMS	LPR	LU	BD	DCONMS	LSCMS	DRVS[1]	BHTA	TQ_3[2]	kg
MM CAB T06M06-16/.63	T06	M06	16.00	11.60	9.30	9.70	14.50	8.0	1.5	15	0.01
MM CAB T06M08-16/.63	T06	M08	16.00	13.70	9.60	13.00	17.50	11.0	6.0	20	0.02
MM CAB T06M08-25/1.0	T06	M08	25.00	11.30	9.30	13.00	17.50	11.0	1.5	20	0.02
MM CAB T06M10-25/1.0	T06	M10	25.00	16.60	9.60	18.00	20.00	11.0	5.0	29	0.04
MM CAB T08M08-16/.63	T08	M08	16.00	5.40	11.70	13.00	17.50	11.0	11.4	20	0.03
MM CAB T08M08-25/1.0	T08	M08	25.00	19.50	11.70	13.00	17.50	11.0	1.5	20	0.03
MM CAB T08M10-20/.75	T08	M10	20.00	11.30	11.70	18.00	20.00	13.0	7.0	29	0.04
MM CAB T08M10-25/1.0	T08	M10	25.00	14.20	11.70	18.00	20.00	11.0	1.5	29	0.03
MM CAB T08M12-20/.75	T08	M12	20.00	9.30	11.70	21.00	22.00	13.0	7.0	33	0.05
MM CAB T08M12-25/1.0	T08	M12	25.00	12.50	11.70	21.00	22.00	13.0	1.5	33	0.04

• Do not apply lubricant to the threaded connection • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

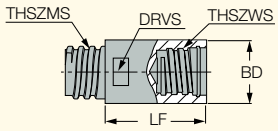
(1) Clamping wrench size

(2) Tool tightening torque Nxm (lbfxin)

MULTI-MASTER

MM CAB-T-T

MULTI-MASTER Shank Extensions



Designation	BD	THSZMS	THSZWS	LF	DRVS(1)	kg
MM CAB T05T05-25/1.0-C	7.60	T05	T05	25.40	6.0	0.02
MM CAB T06T06-25/1.0-C	9.30	T06	T06	25.40	8.0	0.02
MM CAB T08T08-25/1.0-C	11.50	T08	T08	25.40	10.0	0.02
MM CAB T10T10-38/1.5-C	15.20	T10	T10	38.10	13.0	0.08
MM CAB T12T12-38/1.5-C	18.45	T12	T12	38.10	16.0	0.11
MM CAB T15T15-45/1.77-C	23.90	T15	T15	45.00	20.0	0.21

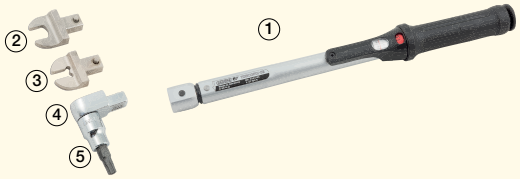
• Clamping key should be ordered separately • For adaptation, see page 44

(1) Clamping wrench size

Accessories

MM Adjustable Torque Keys

Adjustable Torque Handle and Keys for Secure and Accurate Tightening of MULTI-MASTER Milling Heads



Designation	Fig.	Ts(1)	Key	TQ(2)
TORQUE WRENCH 5-50Nm 9X12	1	-	-	-
MM WRENCH 6-05	2	T05	-	7.0
MM WRENCH 8-06	2	T06	-	10.0
MM WRENCH 10-08	2	T08	-	15.0
MM WRENCH 13-10	2	T10	-	28.0
MM WRENCH 16-12	2	T12	-	28.0
MM WRENCH 20-15	2	T15	-	40.0
MM WRENCH 4E-05	3	T05	-	7.0
MM WRENCH 5E-06	3	T06	-	10.0
MM WRENCH 7E-08	3	T08	-	15.0
MM WRENCH 8E-10	3	T10	-	28.0
MM WRENCH 9E-12	3	T12	-	28.0
INSERT TOOL 3/8" 9X12mm	4	-	-	-
BIT SOCKET T20 3/8" DRIVE	5	-	Torx T20	-
BIT SOCKET T25 3/8" DRIVE	5	-	Torx T25	-
BIT SOCKET T30 3/8" DRIVE	5	-	Torx T30	-
BIT SOCKET T40 3/8" DRIVE	5	-	Torx T40	-
BIT SOCKET T50 3/8" DRIVE	5	-	Torx T50	-

• NOTE: For recommended clamping torque for each MULTI-MASTER connection size, see page 92

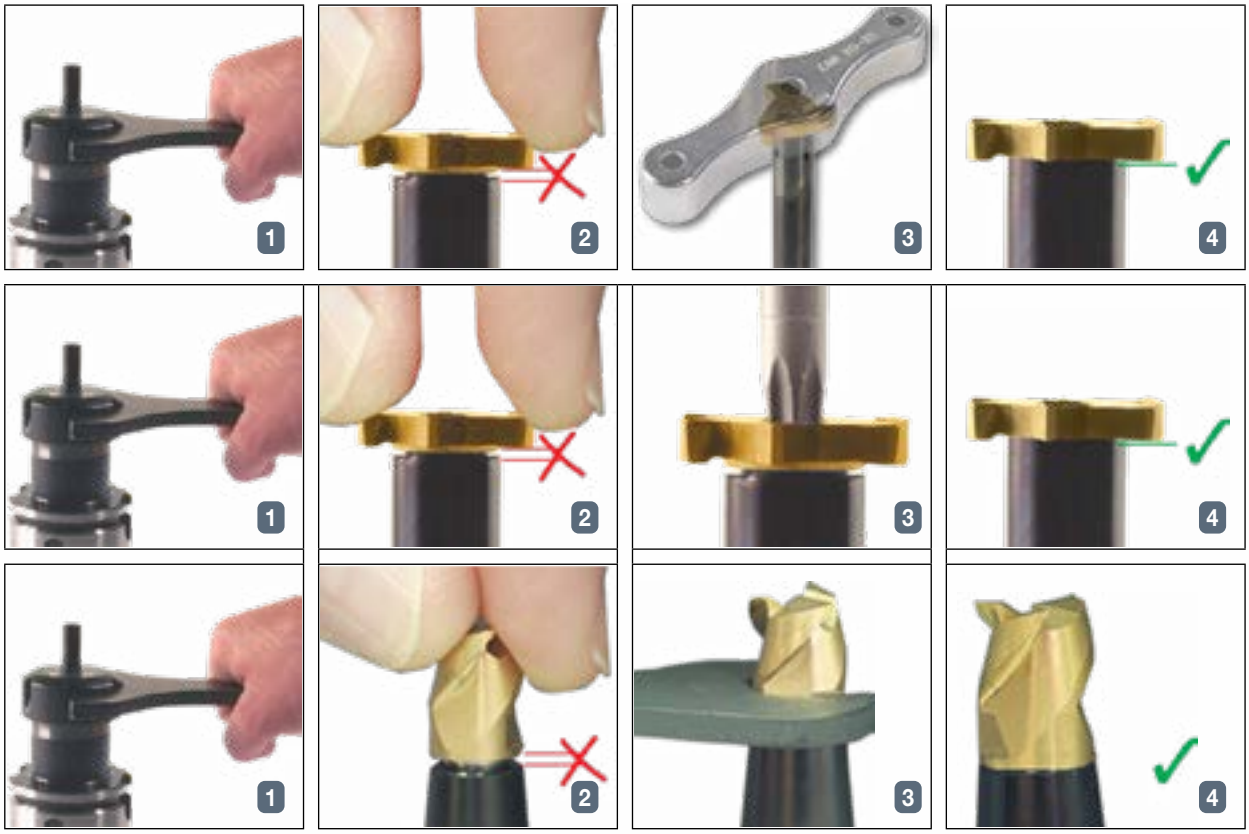
(1) MULTI-MASTER connection size

(2) Clamping torque Nxm

Adjustable Torque Handle with Interchangeable Wrenches for Clamping MULTI-MASTER Milling Heads

The adjustable torque handle, interchangeable wrenches and Torx bits are optional and should be ordered separately.

Clamping and Indexing Instructions



Do not apply lubricant to the threaded connection.

Thread Size	Key[1]	Tightening Torque (Nxcm)
T04	MM KEY 6x4	400
T05	MM KEY 6x4	700
T06	MM KEY 8x5	1000
T08	MM KEY 10x7	1500
T10	MM KEY 13x8	2800
T12	MM KEY 16x9	2800
T15	MM KEY 20	4000
T21	MM WRENCH 24-21	11000

[1] Order separately