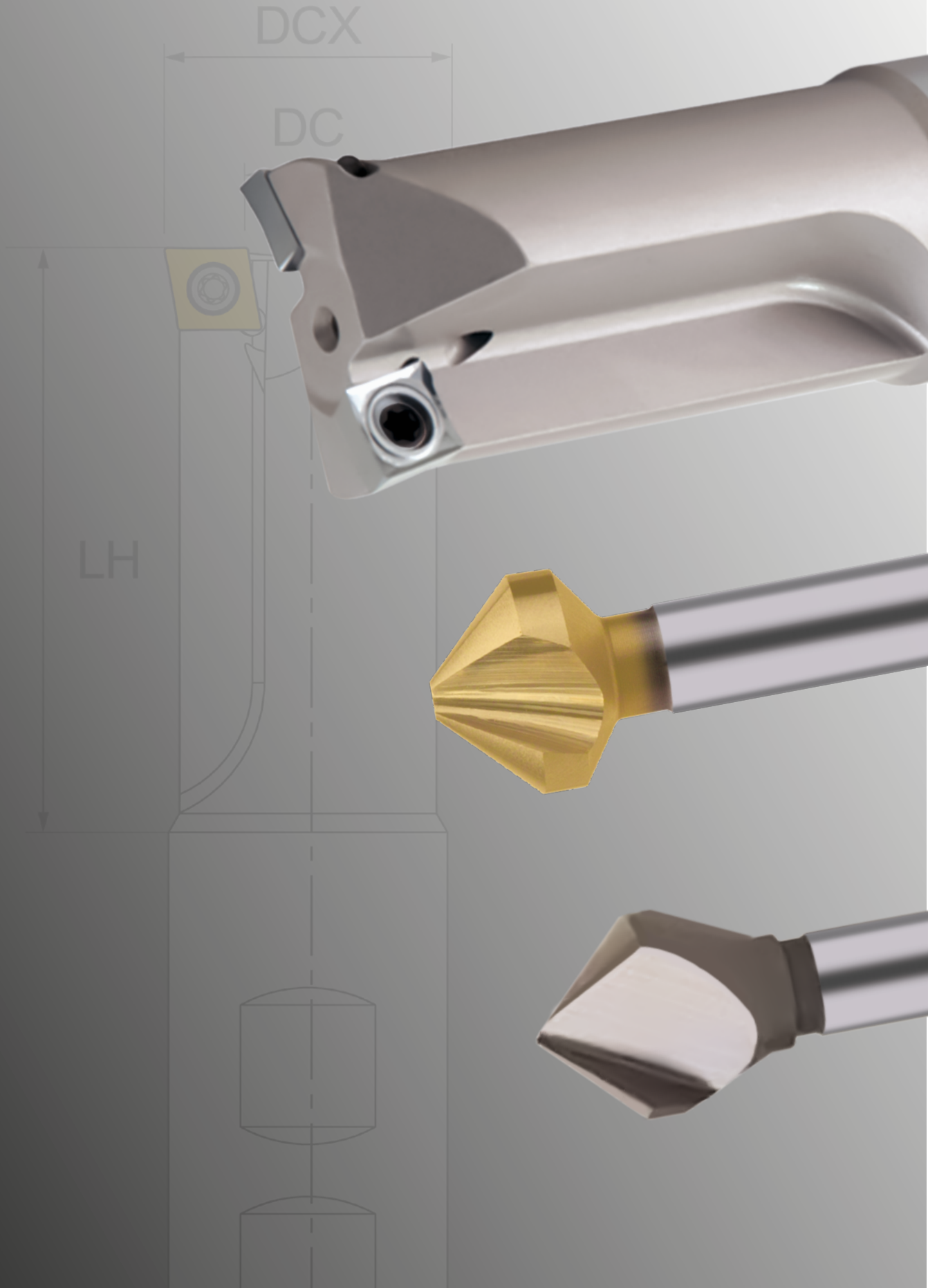




COUNTERBORING & COUNTERSINKING



COUNTERBORES

Code	Item	Description	Page No.
CBT		Indexable For M10 - M20 Cap Screws	P.3
721316		HSS-E Plain Shank For M3 - M12 Cap Screws	P.4

3-FL HSSCo & HSS COUNTER-SINKS

702302 702305		HSSCo 90° ø4.3mm - 31.0mm	P.5
702301 702304		HSS 90° ø4.3mm - 31.0mm	P.6

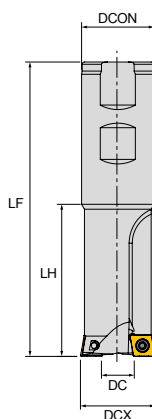
1-FL HSSCo COUNTERSINKS

702202		HSSCo 90° ø10.0mm - 50.0mm	P.7
		Cutting Data	P.11-14

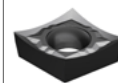


INDEXABLE COUNTERBORE

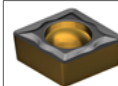
CBT COUNTERBORE



Inserts P.8-10



CCGT 0602..
CCGT 09T3..



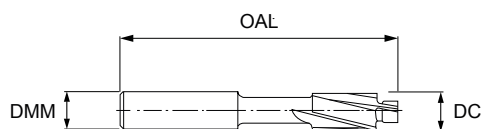
CCMT 0602..
CCMT 09T3..



EDP Code	TOOL CODE	♠	DC	DCX	DCON	LH	LF	ZEFP	To Suit Screw	Insert	Screw	Wrench
BTH0075	CBT.176162-06	X	6	17	16	30	150	2	-	CCGT 06 CCMT 06	TXS2506	TXW08
BTH0076	CBT.187162-06	♠	7	18	16	32	100	2	M10			
BTH0077	CBT.209202-06	♠	9	20	20	40	100	2	M12			
BTH0078	CBT.2685252-09	♠	8.5	26	25	50	130	2	M16	CCGT 09 CCMT 09	TXS3509	TXW15
BTH0079	CBT.30125322-09	♠	12.5	30	32	65	130	2	-			
BTH0080	CBT.33155322-09	♠	15.5	33	32	65	130	2	M20			



HSS-E COUNTERBORE



HSS-E

BSG
DIN
373DIN
1835A

Series No. 721316

► cutting conditions : p.14

For socket head cap screw recesses

MEDIUM TOLERANCE ORDCODE	SCREW SIZE	CUTTING DIA. DC	PILOT DIA	SHANK DIA. DMM	O/ALL LENGTH OAL
7213160300	M3	6.0	3.4	5	71
7213160350	M3.5	6.5	3.9	5	71
7213160400	M4	8.0	4.5	5	71
7213160500	M5	10.0	5.5	8	80
7213160600	M6	11.0	6.6	8	80
7213160800	M8	15.0	9.0	12.5	100
7213161000	M10	18.0	11.0	12.5	100
7213161200	M12	20.0	14.0	12.5	100
FINE TOLERANCE ORDCODE	SCREW SIZE	CUTTING DIA. DC	PILOT DIA	SHANK DIA. DMM	O/ALL LENGTH OAL
7213169001	M3	6.0	3.2	5	71
7213169002	M3.5	6.5	3.7	5	71
7213169003	M4	8.0	4.3	5	71
7213169004	M5	10.0	5.3	8	80
7213169005	M6	11.0	6.4	8	80
7213169006	M8	15.0	8.4	12.5	100
7213169007	M10	18.0	10.5	12.5	100
7213169008	M12	20.0	13.0	12.5	100
BEFORE THREADING ORDCODE	SCREW SIZE	CUTTING DIA. DC	PILOT DIA	SHANK DIA. DMM	O/ALL LENGTH OAL
7213169009	M3	6.0	2.5	5	71
7213169010	M3.5	6.5	2.9	5	71
7213169011	M4	8.0	3.3	5	71
7213169012	M5	10.0	4.2	8	80
7213169013	M6	11.0	5.0	8	80
7213169014	M8	15.0	6.8	12.5	100
7213169015	M10	18.0	8.5	12.5	100
7213169016	M12	20.0	10.2	12.5	100

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●					●								
○ Secondary																



HSSCo 3-FL COUNTERSINK 60°, 90°, 120°



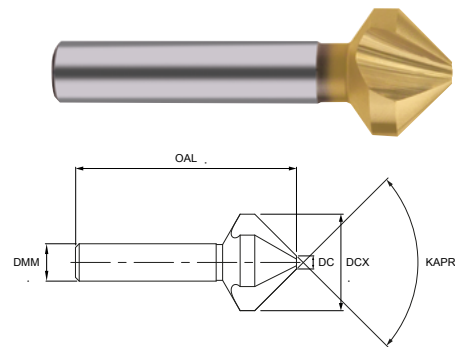
HSS-Co

BSG
DIN
335CDIN
1835A

Series No. 702302, 702305

► cutting conditions : p.12

For producing countersinks for screws.
Self centering and chatter free.
Can be used for chamfering.



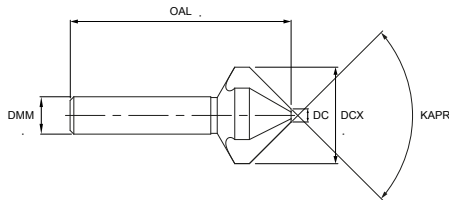
UNCOATED ORDCODE	TIN COATED ORDCODE	DIAMETER DCX	SHANK DIAMETER DMM	O/ALL LENGTH OAL	MIN. DIAMETER DC	ANGLE KAPR
7023020430	7023050430	4.3	4	40	1.3	90°
7023020500	-	5.0	4	40	1.5	90°
7023020600	7023050600	6.0	5	45	1.5	90°
7023020630	7023050630	6.3	5	45	1.5	90°
7023020700	-	7.0	6	50	1.8	90°
7023020800	7023050800	8.0	6	50	2.0	90°
7023020830	7023050830	8.3	6	50	2.0	90°
7023021000	7023051000	10.0	6	50	2.5	90°
7023021040	7023051040	10.4	6	50	2.5	90°
7023021150	-	11.5	8	56	2.8	90°
7023021240	7023051240	12.4	8	56	2.8	90°
7023021500	7023051500	15.0	10	60	3.2	90°
7023021650	7023051650	16.5	10	60	3.2	90°
7023021900	-	19.0	10	63	3.5	90°
7023022050	7023052050	20.5	10	63	3.5	90°
7023022300	-	23.0	10	67	3.8	90°
7023022500	7023052500	25.0	10	67	3.8	90°
7023023000	7023053000	30.0	12	71	4.2	90°
7023023100	7023053100	31.0	12	71	4.2	90°
7023029001	-	6.3	5	45	1.6	60°
7023029002	-	8.0	6	50	2.0	60°
7023029003	-	10.0	6	50	2.5	60°
7023029004	-	12.5	8	56	3.2	60°
7023029005	-	16.0	10	63	4.0	60°
7023029006	-	20.0	10	67	5.0	60°
7023029007	-	25.0	10	71	6.3	60°
7023029008	-	8.0	6	49	2.0	120°
7023029009	-	12.5	8	54	2.8	120°
7023029010	-	16.0	10	57	3.2	120°
7023029011	-	20.0	10	59	3.5	120°
7023029012	-	25.0	10	65	3.8	120°

Diameter Tolerance TCDC	Shank Dia. Tolerance TCDMM
0.05 / -0.05	h9

ISO	P			M		K		N				S		H		
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●		○		●	●	●								
○ Secondary																



HSS 3-FL COUNTERSINK 90°



HSS

BSG
DIN
335CDIN
1835A

Series No. 702301, 702304

► cutting conditions : p.12

For producing countersinks for screws.
Self centering and chatter free.
Can be used for chamfering.

UNCOATED ORDCODE	TIN COATED ORDCODE	DIAMETER DCX	SHANK DIAMETER DMM	O/ALL LENGTH OAL	MIN. DIAMETER DC	ANGLE KAPR
7023010430	7023040430	4.3	4	40	1.3	90°
7023010500	7023040500	5.0	4	40	1.5	90°
7023010600	7023040600	6.0	5	45	1.5	90°
7023010630	7023040630	6.3	5	45	1.5	90°
7023010700	7023040700	7.0	6	50	1.8	90°
7023010800	7023040800	8.0	6	50	2.0	90°
7023010830	7023040830	8.3	6	50	2.0	90°
7023011000	7023041000	10.0	6	50	2.5	90°
7023011040	7023041040	10.4	6	50	2.5	90°
7023011150	7023041150	11.5	8	56	2.8	90°
7023011240	7023041240	12.4	8	56	2.8	90°
7023011500	7023041500	15.0	10	60	3.2	90°
7023011650	7023041650	16.5	10	60	3.2	90°
7023011900	7023041900	19.0	10	63	3.5	90°
7023012050	7023042050	20.5	10	63	3.5	90°
7023012300	7023042300	23.0	10	67	3.8	90°
7023012500	7023042500	25.0	10	67	3.8	90°
7023013000	7023043000	30.0	12	71	4.2	90°
7023013100	7023043100	31.0	12	71	4.2	90°

Diameter Tolerance TDCD	Shank Dia. Tolerance TCDMM
0.05 / -0.05	h9

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●		○		●	●	●								
○ Secondary																



HSS 1-FL COUNTERSINK 90°

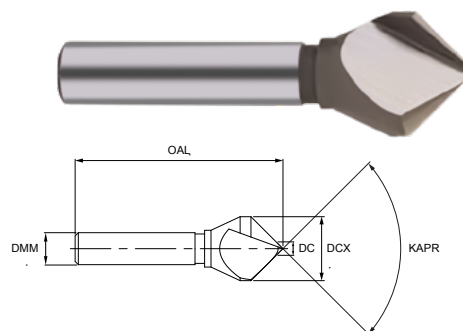


HSS-Co

Series No. 702202

► cutting conditions : p.13

For soft metals, wood and hard plastic.
Chatter free for excellent surface finish.



EUROPA CODE ORCODE	DIAMETER DCX	SHANK DIAMETER DMM	O/ALL LENGTH OAL	MIN. DIAMETER DC	ANGLE KAPR
7022021000	10.0	6	45	1.0	90°
7022021500	15.0	8	55	2.0	90°
7022022000	20.0	10	65	2.0	90°
7022022500	25.0	12	78	3.0	90°
7022023000	30.0	12	88	3.0	90°
7022023500	35.0	16	110	4.0	90°
7022024000	40.0	16	115	5.0	90°
7022024500	45.0	16	120	10.0	90°
7022025000	50.0	16	130	12.0	90°

Diameter Tolerance TCDC	Shank Dia. Tolerance TCDMM
+0.03	h9

ISO	P			M		K		N				S		H		
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●					●	●		●						
○ Secondary																



COUNTERBORING



CCGT 80° RHOMBIC TYPE

▶ EDP Code TI..... Example: CCGT 060202-AL ET10U = TI01163

CCGT	DESIGNATION	RE (mm)	f _n (mm/rev)	a _p (mm)	Material Compatibility Matrix													
					ET101C	ET31C	ET315C	ET32C	ET33C	ET225C	ET21P	ET23P	ET24P	ET41P	ET801	ET10D	ET10U	CT10U
					P	●	●	●	●	○					●			●
					M				●	●	●	●	○	○			●	
					K	●	●								●		●	
					N											●	●	
					S						○	○	○	●				
					H		○								○			
Finishing to Roughing 	AL	CCGT 060202-AL	0.2	0.02 - 0.15	0.1 - 2.0												●	
		CCGT 060204-AL	0.4	0.05 - 0.15	0.5 - 2.0												●	
		CCGT 09T302-AL	0.2	0.02 - 0.08	0.5 - 1.0												●	
		CCGT 09T304-AL	0.4	0.05 - 0.25	0.5 - 2.0												●	
		CCGT 09T308-AL	0.8	0.10 - 0.35	1.0 - 3.0												●	
		CCGT 120402-AL	0.2	0.04 - 0.15	0.1 - 1.0												●	
		CCGT 120404-AL	0.4	0.04 - 0.20	0.3 - 1.5												●	
		CCGT 120408-AL	0.8	0.04 - 0.30	0.6 - 2.5												●	
Finishing to Medium 	MSF	CCGT 060201-MSF	0.1	0.02 - 0.15	0.1 - 1.5												●	
		CCGT 060202-MSF	0.2	0.02 - 0.15	0.1 - 1.5							●	●	●	●			
		CCGT 060204-MSF	0.4	0.03 - 0.20	0.1 - 2.0							●	●	●	●			
		CCGT 09T301-MSF	0.1	0.02 - 0.15	0.1 - 2.5							●	●	●	●			
		CCGT 09T302-MSF	0.2	0.02 - 0.15	0.1 - 2.5							●	●	●	●			
		CCGT 09T304-MSF	0.4	0.03 - 0.20	0.1 - 2.5							●	●	●	●			
		CCGT 09T308-MSF	0.8	0.03 - 0.25	0.1 - 2.5							●	●	●	●			
												01672	01673	01674	01436			
										01675	01676	01677	01437					
										01678	01679	02066	01658					
										01680	01681	02067	01577					
										01682	01683	01684	01578					
										01685	01686	01687	01579					

ISO	P			M		K		N	S	H	
MATERIAL	Non-alloy steel <25 HRC	Low alloy steel 25-35 HRC	High alloy steel, Tool steel 35-45 HRC	Ferritic / Martensitic Stainless steel	Austenitic Stainless steel	Grey Cast iron	Nodular Cast iron	Aluminium & Non-ferrous material	Heat Resistant and Super Alloys	Hardened steel <55 HRC	
VDI GROUP	1-5	6-9	10-11	12-13	14	15-16	17-20	21-30	31-37	38-41	
V _c (m/min)	ET101C	-	-	-	-	170 - 420	120 - 410	-	-	-	
	ET31C	170 - 450	180 - 380	100 - 330	-	120 - 300	120 - 280	-	-	40 - 80	
	ET315C	180 - 500	170 - 450	60 - 180	-	-	-	-	-	-	
	ET32C	180 - 380	110 - 350	60 - 300	-	-	-	-	-	-	
	ET33C	150 - 350	90 - 300	70 - 250	120 - 220	50 - 180	-	-	-	-	
	ET225C	-	-	-	160 - 220	100 - 200	-	-	-	-	
	ET21P	135 - 405	120 - 350	95 - 280	130 - 230	100 - 200	-	-	30 - 90	-	
	ET23P	-	-	-	110 - 180	40 - 130	-	-	20 - 40	-	
	ET24P	-	-	-	80 - 150	30 - 120	-	-	20 - 40	-	
	ET41P	-	-	-	95 - 290	90 - 210	-	-	35 - 90	-	
	ET801	120 - 200	70 - 230	70 - 180	70 - 180	-	60 - 160	60 - 120	-	-	40 - 80
	ET10D	-	-	-	-	-	-	-	350 - 1200	-	-
	ET10U	-	-	-	-	-	-	-	250 - 800	-	-
CT10U	150 - 480	160 - 420	100 - 360	130 - 260	110 - 240	130 - 450	130 - 400	-	-	-	



COUNTERBORING



CCMT 80° RHOMBIC TYPE

► EDP Code TI..... Example: CCGT 060201-MSF ET41P = TI01576

		INSERT				EDP Code																				
		LE	IC	S	P	M	K	N	S	H	ET101C	ET31C	ET315C	ET32C	ET33C	ET225C	ET21P	ET23P	ET24P	ET41P	ET801	ET10D	ET10U	CT10U		
		6.2	6.35	2.38	●	●	●	●	○		○															
	CC-- 0602	6.2	6.35	2.38	●	●	●	●	○		○											○				
	CC-- 09T3	9.2	9.53	3.97	●	●	●	●	○		○															
	CC-- 1204	12.4	12.7	4.76	●	●	●	●	○		○															
CCMT	DESIGNATION	RE (mm)	f _n (mm/rev)	a _p (mm)	ET101C	ET31C	ET315C	ET32C	ET33C	ET225C	ET21P	ET23P	ET24P	ET41P	ET801	ET10D	ET10U	CT10U								
	Finishing BF	CCMT 060204-BF	0.4	0.05 - 0.20	0.5 - 2.0	●	●	●	●																	
		CCMT 09T304-BF	0.4	0.05 - 0.25	0.5 - 2.0	●	●	●	●																	
		CCMT 09T308-BF	0.8	0.05 - 0.25	1.0 - 2.0	●	●	●	●																	
		CCMT 120404-BF	0.4	0.10 - 0.25	1.5 - 3.0	●	●	●	●																	
	Finishing MF	CCMT 060208-MF	0.8	0.05 - 0.20	0.1 - 2.0						●	●	●	●												
		CCMT 09T302-MF	0.2	0.04 - 0.15	0.1 - 2.0						●	●	●	●												
		CCMT 09T304-MF	0.4	0.06 - 0.25	0.1 - 2.0						●	●	●	●												
		CCMT 09T308-MF	0.8	0.08 - 0.30	0.1 - 2.0						●	●	●	●												
	Finishing Cermet PF	CCMT 09T302-PF	0.2	0.04 - 0.15	0.1 - 2.0																				●	
		CCMT 09T304-PF	0.4	0.06 - 0.25	0.1 - 2.0																					●
		CCMT 09T308-PF	0.8	0.08 - 0.30	0.1 - 2.0																					●
	Medium BG	CCMT 060204-BG	0.4	0.10 - 0.25	0.5 - 2.0	●	●	●	●		●						●									
		CCMT 060208-BG	0.8	0.10 - 0.25	0.8 - 2.0	●	●	●	●		●							●								
		CCMT 09T304-BG	0.4	0.15 - 0.30	0.5 - 2.5	●	●	●	●									●								
		CCMT 09T308-BG	0.8	0.15 - 0.30	0.8 - 2.5	●	●	●	●									●								
		CCMT 120404-BG	0.4	0.15 - 0.35	0.5 - 3.0	●	●	●	●																	
		CCMT 120408-BG	0.8	0.15 - 0.35	0.8 - 3.0	●	●	●	●										●							
		CCMT 120412-BG	1.2	0.15 - 0.35	1.2 - 3.0	●	●	●	●											●						

Continued ►

ISO	P			M		K		N	S	H	
MATERIAL	Non-alloy steel <25 HRC	Low alloy steel 25-35 HRC	High alloy steel, Tool steel 35-45 HRC	Ferritic / Martensitic Stainless steel	Austenitic Stainless steel	Grey Cast iron	Nodular Cast iron	Aluminium & Non-ferrous material	Heat Resistant and Super Alloys	Hardened steel <55 HRC	
VDI GROUP	1-5	6-9	10-11	12-13	14	15-16	17-20	21-30	31-37	38-41	
Vc (m/min)	ET101C	-	-	-	-	170 - 420	120 - 410	-	-	-	
	ET31C	170 - 450	180 - 380	100 - 330	-	120 - 300	120 - 280	-	-	40 - 80	
	ET315C	180 - 500	170 - 450	60 - 180	-	-	-	-	-	-	
	ET32C	180 - 380	110 - 350	60 - 300	-	-	-	-	-	-	
	ET33C	150 - 350	90 - 300	70 - 250	120 - 220	50 - 180	-	-	-	-	
	ET225C	-	-	-	160 - 220	100 - 200	-	-	-	-	
	ET21P	135 - 405	120 - 350	95 - 280	130 - 230	100 - 200	-	-	30 - 90	-	
	ET23P	-	-	-	110 - 180	40 - 130	-	-	20 - 40	-	
	ET24P	-	-	-	80 - 150	30 - 120	-	-	20 - 40	-	
	ET41P	-	-	-	95 - 290	90 - 210	-	-	35 - 90	-	
	ET801	120 - 200	70 - 230	70 - 180	70 - 180	-	60 - 160	60 - 120	-	-	40 - 80
	ET10D	-	-	-	-	-	-	-	350 - 1200	-	-
	ET10U	-	-	-	-	-	-	-	250 - 800	-	-
CT10U	150 - 480	160 - 420	100 - 360	130 - 260	110 - 240	130 - 450	130 - 400	-	-	-	



COUNTERBORING



CCMT 80° RHOMBIC TYPE

► EDP Code TI..... Example: CCMT 09T304-PM CT10U = TI01916

		INSERT	LE	IC	S	Material Selection Matrix																				
		CC-- 0602	6.2	6.35	2.38	P	M	K	N	S	H	ET101C	ET31C	ET315C	ET32C	ET33C	ET225C	ET21P	ET23P	ET24P	ET41P	ET801	ET10D	ET10U	CT10U	
		CC-- 0602	6.2	6.35	2.38	●	●	●	●	○																●
		CC-- 09T3	9.2	9.53	3.97	●	●	●	●	○																
		CC-- 1204	12.4	12.7	4.76												○	○	○	●						
CCMT	DESIGNATION	RE (mm)	f _n (mm/rev)	a _p (mm)																						
Medium MM 	CCMT 09T304-MM	0.4	0.08 - 0.25	0.25 - 3.0													●	●	●	●	●					
	CCMT 09T308-MM	0.8	0.10 - 0.30	0.5 - 3.0														●	●	●	●	●				
Medium Cermet PM 	CCMT 09T304-PM	0.4	0.08 - 0.25	0.25 - 3.0																					●	
	CCMT 09T308-PM	0.8	0.10 - 0.30	0.5 - 3.0																						●

ISO	P			M		K		N	S	H	
MATERIAL	Non-alloy steel <25 HRc	Low alloy steel 25-35 HRc	High alloy steel, Tool steel 35-45 HRc	Ferritic / Martensitic Stainless steel	Austenitic Stainless steel	Grey Cast iron	Nodular Cast iron	Aluminium & Non-ferrous material	Heat Resistant and Super Alloys	Hardened steel <55 HRc	
VDI GROUP	1-5	6-9	10-11	12-13	14	15-16	17-20	21-30	31-37	38-41	
V _c (m/min)	ET101C	-	-	-	-	170 - 420	120 - 410	-	-	-	
	ET31C	170 - 450	180 - 380	100 - 330	-	120 - 300	120 - 280	-	-	40 - 80	
	ET315C	180 - 500	170 - 450	60 - 180	-	-	-	-	-	-	
	ET32C	180 - 380	110 - 350	60 - 300	-	-	-	-	-	-	
	ET33C	150 - 350	90 - 300	70 - 250	120 - 220	50 - 180	-	-	-	-	
	ET225C	-	-	-	160 - 220	100 - 200	-	-	-	-	
	ET21P	135 - 405	120 - 350	95 - 280	130 - 230	100 - 200	-	-	30 - 90	-	
	ET23P	-	-	-	110 - 180	40 - 130	-	-	20 - 40	-	
	ET24P	-	-	-	80 - 150	30 - 120	-	-	20 - 40	-	
	ET41P	-	-	-	95 - 290	90 - 210	-	-	35 - 90	-	
	ET801	120 - 200	70 - 230	70 - 180	70 - 180	-	60 - 160	60 - 120	-	-	40 - 80
	ET10D	-	-	-	-	-	-	-	350 - 1200	-	-
	ET10U	-	-	-	-	-	-	-	250 - 800	-	-
CT10U	150 - 480	160 - 420	100 - 360	130 - 260	110 - 240	130 - 450	130 - 400	-	-	-	



**COUNTERSINKS &
COUNTERBORES
CUTTING DATA**



CUTTING DATA



702301, 702302, 702304, 702305 (HSSCo & HSS 3-Fl Countersink)									
VDI MATERIAL GROUP		HRc	vc (m/min)	fn (mm/rev)					
				ø4.3 -6.3	ø7.0 -10.0	ø10.4 -15.0	ø16.5 -23.0	ø25.0 -31.0	
P	1-5	Non-alloy Steel	<25	28 (25-30)	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
	6-9	Low alloy Steel	25-35	18 (15-20)	0.06 (0.04-0.08)	0.08 (0.06-0.10)	0.12 (0.10-0.14)	0.15 (0.13-0.17)	0.18 (0.16-0.20)
M	12-13	Stainless Steel		7 (6-8)	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)
K	15-16	Grey Cast Iron		20 (15-25)	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
	17-20	Nodular/ Malleable Cast Iron		10 (8-12)	0.06 (0.04-0.08)	0.08 (0.06-0.10)	0.12 (0.10-0.14)	0.15 (0.13-0.17)	0.18 (0.16-0.20)
N	21-24	Aluminium Si<12%		28 (25-30)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.16 (0.14-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)
	26-28	Copper, Copper Alloys		23 (20-25)	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)

vc - cutting speed (m/min)

n - RPM (rev/min)

fz - feed rate (mm/tooth)

fn - feed rate (mm/rev)

z - No. of teeth

ap - axial depth of cut

ae - radial depth of cut

$$\text{To calculate RPM from cutting speed: } n = \frac{v_c * 1000}{\pi * \varnothing}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n * \pi * \varnothing}{1000}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.



CUTTING DATA



702202 (HSSCo 1-FI Countersink)									
VDI MATERIAL GROUP		HRc	vc (m/min)	fn (mm/rev)					
				ø10.0 -15.0	ø20.0 -25.0	ø30.0 -35.0	ø40.0 -45.0	ø50.0	
P	1-5	Non-alloy Steel	<25	28 (25-30)	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	6-9	Low alloy Steel	25-35	18 (15-20)	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
M	12-13	Stainless Steel		7 (6-8)	0.06 (0.05-0.07)	0.08 (0.07-0.09)	0.10 (0.09-0.11)	0.12 (0.11-0.13)	0.13 (0.12-0.14)
K	15-16	Grey Cast Iron		20 (15-25)	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	17-20	Nodular/ Malleable Cast Iron		10 (8-12)	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
N	21-24	Aluminium Si<12%		28 (25-30)	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	29.1	Plastics, Acrylics		23 (20-25)	0.06 (0.05-0.07)	0.08 (0.07-0.09)	0.10 (0.09-0.11)	0.12 (0.11-0.13)	0.13 (0.12-0.14)

vc - cutting speed (m/min)

n - RPM (rev/min)

fz - feed rate (mm/tooth)

fn - feed rate (mm/rev)

z - No. of teeth

ap - axial depth of cut

ae - radial depth of cut

$$\text{To calculate RPM from cutting speed: } n = \frac{v_c * 1000}{\pi * \varnothing}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n * \pi * \varnothing}{1000}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.



CUTTING DATA



721316 (HSS-E Counterbore)												
VDI MATERIAL GROUP		HRc		Size (mm)								
				6.0	6.5	8.0	10.0	11.0	15.0	18.0	20.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	25	25	25	25	25	25	25	25
				n	1325	1225	995	795	720	530	440	395
				f_z	0.08	0.08	0.08	0.11	0.11	0.11	0.13	0.13
				f (mm/min)	320	295	240	255	235	170	165	150
	6-9	Low alloy Steel	25-35	v_c (m/min)	18	18	18	18	18	18	18	18
				n	955	880	715	570	520	380	320	285
				f_z	0.08	0.08	0.08	0.11	0.44	0.44	0.13	0.13
				f (mm/min)	230	215	175	185	170	125	120	110
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	18	18	18	18	18	18	18	18
				n	955	880	715	570	520	380	320	285
				f_z	0.08	0.08	0.08	0.11	0.44	0.44	0.13	0.13
				f (mm/min)	230	215	175	185	170	125	120	110
N	21-24	Aluminium/Aluminium Alloys	v_c (m/min)	30	30	30	30	30	30	30	30	
			n	1590	1470	1195	955	870	635	530	475	
			f_z	0.08	0.08	0.08	0.11	0.11	0.11	0.13	0.13	
			f (mm/min)	380	350	285	315	285	210	205	185	

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed rate (mm/tooth)
 f_n - feed rate (mm/rev)
 z - No. of teeth
 a_p - axial depth of cut
 a_e - radial depth of cut

$$\text{To calculate RPM from cutting speed: } n = \frac{v_c * 1000}{\pi * \varnothing}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n * \pi * \varnothing}{1000}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.