Notes on high-speed cutting

1. Maximum permissible speeds:
   The limit values specified in the tables should not be exceeded. Otherwise, correct operation and/or reliability are no longer guaranteed.
2. Only use original Walter indexable inserts and assembly parts (screws, etc.). New screws should be used after having replaced the indexable inserts a maximum of five times.
3. Observe the torque specified in the catalogues.
4. Balancing:
   Balancing in two steps is required when milling at fast speeds (> 6000 rpm) or at circumferential speeds of > 1000 m/min:

   a. Basic balancing of the tool body including indexable inserts (can be carried out by Walter if required). In this case, tool adaptors that have been balanced separately beforehand must be used.

   b. Fine balancing of the tool when fully mounted on the adaptor. The fine balancing operation is strongly recommended, as even the smallest concentricity fault can seriously affect the balance status.
5. Short projection lengths reduce concentricity faults or an imbalance, and increase spindle service life. The specified speeds only apply to the use of tools without additional extensions and for tools with a neck length of ≤ 2.2 × D_c.

   For tools with longer neck lengths, the speeds must be reduced upon consultation with Walter.

			n_{max} [rpm] with D												
Tool	**Safety-related parts**	**in relation to**	**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 15**	**Ø 16**	**Ø 18**	**Ø 20**	**Ø 21**	**Ø 22**	**Ø 24**	**Ø 25**	
M5468	RD..0501M0..	D_a		40.000	40.000			40.000		40.000					
	RD..07T1M0..	D_a					40.000			40.000				40.000	
	RO.X0803M04..	D_a						40.000						40.000	
	RO.X10T3M08..	D_a								40.000				40.000	
	RO.X1204M08..	D_a											36.400		
	RO.X1605M08..	D_a													
	RO.X2006M08..	D_a													
M5460[1]	P32..	D_c						40.000*		40.000*				40.000*	
M5250	BC.T1605..	D_c													
	SC.T1105..	D_c													
M5137	TNMU11T3..	D_c												24.400	
	TNMU1605..	D_c													
M5130	AC.T0602..	D_c		40.000	40.000	40.000		40.000	40.000	40.000		40.000		40.000	
	BC.T0903..	D_c						40.000	40.000	40.000		38.700		36.000	
	BC.T1204..	D_c												28.100	
	BC.T1605..	D_c												22.300	
M5012	SN.X0904..	D_c													
	SN.X1205..	D_c													
M5012...-AP	SN.X1205..	D_c													
M5011	SN.X1205..	D_c													
M5011...-AP	SN.X1205..	D_c													
M5009	SN.X0904..	D_c												34.100	
	SN.X1205..	D_c													
M5009...-AP	SN.X1205..	D_c													
M6420	ENMX1106 ..	D_a													
M5008	ENMX08T316R..	D_a							32.700	29.200				26.100	
M5004	OD..0504..	D_a													
	OD..0605..	D_a													
M4792	SD..06T204..	D_c							14.000	12.000					
	LD..08T204..	D_c							14.000	12.000					
	SD..09T308..	D_c												10.000	
	LD..14T308..	D_c												10.000	
	SD..120408..	D_c													
	LD..170408..	D_c													

[1] The specified speed of 40,000 rpm refers to the entire tool diameter range of 8–32 mm.

* Speeds higher than 40,000 rpm are possible under favourable conditions and for short projection lengths upon consultation with Walter.

6. Safety guard:
   Appropriate safety guards or machine encapsulations must be used to safely collect particles which spin off, such as chips or cutting edge parts that are broken as a result of collisions.
7. Damaged tools:
   The operating speed must be specified for the repair of an HSC tool. The table values only apply to tools with a condition equivalent to new condition following repair.
8. Application of standards:
   Walter recommends using the balancing standard DIN 69888, which describes the balancing of tools and the requirements in the machining sector. DIN 69888 is tailored to the needs of the machining sector, and describes the tool balancing requirements in a practical manner. DIN ISO 1940, which was previously often used, describes balancing for all areas of mechanical engineering. The requirements when working at circumferential speeds of >1000 m/min are described in DIN ISO 15641.

	n_{max} [rpm] with D																	
	Ø 28	Ø 30	Ø 32	Ø 35	Ø 40	Ø 42	Ø 50	Ø 52	Ø 63	Ø 66	Ø 80	Ø 85	Ø 100	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315
		36.200																
			36.500															
		38.400	37.100	35.500	33.200		29.700	29.100	26.500									
			31.500		28.200	27.500	25.200	24.700	22.500	21.900	19.900		17.800					
			28.700					22.500	20.500	20.000	18.100		16.200	14.500				
					24.300				19.400		17.200		15.300	13.700	12.100			
			40.000*															
							14.900		13.200		11.600							
							14.900		13.200		11.600							
			21.600		19.300		17.200		15.400									
							10.700		9.600		8.500		7.600	6.800	6.000			
			36.600		32.500		28.900		25.700									
			31.300		27.500		24.600		21.800									
			24.400		21.500		19.100		16.900		14.800							
	20.900		19.300	18.300	16.900	16.500	14.900	14.600	13.200	12.800	11.600	11.200	10.300	9.100	8.000			
			27.300		24.400		21.800		19.500		17.300		15.400					
							16.800		15.000		13.300		11.900	10.600	9.400			
							14.500		13.000		11.500		10.300	9.200	8.100			
					20.000		17.900		16.000		14.100		12.600	11.300	10.000			
							15.300		13.700		12.100		10.800	9.700	8.500			
			30.100		26.900		24.100		21.500		19.000		17.000					
					20.000		17.900		16.000		14.100		12.600	11.300	10.000			
							15.300		13.700		12.100		10.800	9.700	8.500			
					14.500	14.200	13.000	12.700	11.600	11.300	10.200	9.900	9.200					
			23.100	22.100	20.700	20.200	18.500	18.100	16.500	16.100								
			29.400		26.300		23.500		21.000		18.600		16.600	14.900	13.100			
							19.600		17.500		15.500		13.800	12.400	10.900	9.800		
		7.500	7.200															
		7.500	7.200															
					5.500													
					5.500													

Continued →

Notes on high-speed cutting

(Continued)

Tool	Safety-related parts	in relation to	n_{max} [rpm] with D Ø 08	Ø 10	Ø 12	Ø 14	Ø 15	Ø 16	Ø 18	Ø 20	Ø 21	Ø 22	Ø 24	Ø 25
M4574	SD..06T2..	D_c	31.400	29.600	28.100			23.600						
	SD..09T3..	D_c			35.000			32.500		30.400				28.400
	SD..1204..	D_c												20.600
M4575	SD..06T2..	D_c									28.000			25.300
	SD..09T3..	D_c												
	SD..1204..	D_c												
M4256	SD..06T204..	D_c								34.300				29.400
	LD..08T204..	D_c								34.300				29.400
M4257	SD..09T308..	D_c												
	LD..14T308..	D_c												
M4258	SD..1204..	D_c												
	LD..1704..	D_c												
M4132	SD..06T2..	D_c						31.700		28.300				25.300
	SD..09T3..	D_c												34.900
	SD..1204..	D_c												
M4130	LD..08T204...	D_c						40000		34.300				29.400
	LD..14T308...	D_c												40.000
	LD..170408...	D_c												
M4003	SD..09T3...	D_c								40.000				38.000
	SD..1204...	D_c												33.300
M4002	SD..06T2...	D_a								28.300				25.300
	SD..09T3...	D_a												34.900
	SD..1204...	D_a												
M3255	LNHX1206..	D_c												
	XNHX1306..	D_c												
M3024	XN.U0705..	D_c												
	XN.U0906..	D_c												
M3016	LNMX2010..	D_c												
M2472	RP..1204..WIS	D_a												
M2473	RN..1207..WIS	D_a												
M2471	RNMX1005..	D_c												27.200
	RNMX1206..	D_c												
M2331	ZD..15A4..	D_c												
	ZD..20A5..	D_c												
M2131	ZDGT1504..	D_c												40.000
	ZDGT2005..	D_c												
M2136	SNEF1204..	D_c												
M2025	ONHF..0504..	D_c												
	P45424-1	D_c												
M2026	ONHF..0504..	D_c												
	P45424-2	D_c												

[1] The specified speed of 40,000 rpm refers to the entire tool diameter range of 8–32 mm.

* Speeds higher than 40,000 rpm are possible under favourable conditions and for short projection lengths upon consultation with Walter.

	n_{max} [rpm] with D																	
	Ø 30	Ø 32	Ø 35	Ø 40	Ø 42	Ø 50	Ø 52	Ø 63	Ø 66	Ø 80	Ø 85	Ø 100	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315	Ø 500
	25.000																	
	18.200		16.800															
	30.800		27.600															
					17.900													
	25.100																	
	25.100																	
			28.800		25.000		21.750											
			28.800		25.000		21.750											
					17.300		15.000		12.900		11.400							
					17.300		15.000		12.900									
		30.800		27.600		24.600		22.000		19.500								
						17.900		16.000		14.100		12.600	11.300					
		33.600		28.800		25.000												
						17.300		15.000		12.900		11.400	10.000					
		33.600		30.100		26.900		24.000				19.000			4.200	3.800	3.350	
		29.400		26.300		23.500		21.000				16.600	14.900	13.100	4.200	3.800	3.350	
		22.400		20.000		17.900	17.600	16.000	15.600									
		30.800	29.500	27.600		24.600	24.200	22.000	21.400									
						17.900	17.600	16.000	15.600	14.100		12.600	11.300		4.200	3.800	3.350	
						20.200		18.000		15.900								
						20.200		18.000		15.900								
				12.800		11.300		10.000		8.700		7.800	6.900	6.100				
								8.500		7.400		6.500	5.200	4.100				
													1.100	1.000	900	800	700	
		40.000		36.200		32.400												
				25.600		22.800		20.400										
		23.400		20.500		18.100	17.700											
		26.600		23.300		20.400	20.000	18.000										
		40.000		39.800		34.400												
				40.000		34.000												
		37.900		32.400		28.000		24.300		21.100								
		38.100		31.700		26.900		23.100		19.900								
										4.900		4.400	3.900	3.500				
										4.900		4.400	3.900	3.500				
															3.100	2.800		
															3.100	2.800		

Continued →

Notes on high-speed cutting

(Continued)

Tool	Safety-related parts	in relation to	n_{max} [rpm] with D											
			Ø 08	Ø 10	Ø 12	Ø 14	Ø 15	Ø 16	Ø 18	Ø 20	Ø 21	Ø 22	Ø 24	Ø 25
F5041	LN..0904..	D_c												39.600
F5141	LN..1306..	D_c												
F5241	LN..1607..	D_c												
F5038	LN..0904..	D_c												39.600
F5138	LN..1306..	D_c												
F5055	SX..	D_c												
F4038	AD..0803..	D_c								40.000*				38.000
F4138	AD..1204..	D_c												
F4238	AD..1606..	D_c												
F4338	AD..1807..	D_c												
F4053	LN.X0702..	D_c												
F4153	LN.U0803..	D_c												
	LN.U0804..	D_c												
	LN.U1005..	D_c												
F4253	LN.U0804..	D_c												
	LN.U1005..	D_c												
	LN.U1206..	D_c												
	LN.U1608..	D_c												
F4045	XN.F0705..	D_c												
	XN.F0906..	D_c												
F4042 / F4042R	AD..0803..	D_c						40.000*		40.000*				38.000
	AD..10T3..	D_c						39.600		35.400				31.700
	AD..1204..	D_c												28.400
	AD..1606..	D_c												
	AD..1807..	D_c												
F4041	LNGX1307..	D_c												
F4030	P23696-1.0	D_a												34.900
	P23696-2.0	D_a												
F2334R	RO..10T3M0	D_a												
	RO..1204M0	D_a												
F2330	P2633..	D_c								35.400				31.700
F2250	without cartridges	D_c												
F2010	all cartridges													

[1] The specified speed of 40,000 rpm refers to the entire tool diameter range of 8–32 mm.

* Speeds higher than 40,000 rpm are possible under favourable conditions and for short projection lengths upon consultation with Walter.

	n_{max} [rpm] with D																
	Ø 30	Ø 32	Ø 35	Ø 40	Ø 42	Ø 50	Ø 52	Ø 63	Ø 66	Ø 80	Ø 85	Ø 100	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315	Ø 500
		35.000		31.300		28.000		25.000										
				22.500		20.200		18.000		15.900		14.200	12.700	11.200				
						20.200		18.000		15.900		14.200	12.700	11.200				
		35.000		31.300		28.000		25.000										
				22.500		20.200		18.000		15.900								
								5.100		4.000		3.200	2.600	2.000	1.600	1.300		350
		33.600																
		25.100		22.400		20.000		17.900		15.800								
				15.800		14.100		12.600		11.100								
								12.600		11.100		10.000	8.900					
										21.200		19.000	17.000	15.000				
										11.000		9.900	8.800	7.800				
										9.300		8.300	7.400	6.500				
										13.700		12.300	11.000	9.700				
													17.000	15.000				
													16.100	14.200				
													12.400	10.900	9.800	8.700		
														7.800	7.000	6.200	5.500	
								10.000	8.800			7.900	7.000	6.200	5.600			
									5.700			5.100	4.600	4.000	3.600			
		33.600		30.100		26.900												
		28.000		25.000		22.400		20.000										
		25.100		22.400		20.000		17.900		15.800								
				15.800		14.100		12.600		11.100		10.000	8.900	7.900				
		17.600		15.800		14.100		12.600		11.100		10.000	8.900	7.900				
		16.800		15.000		13.400		12.000		10.600		9.500	8.500	7.500				
		30.800		27.600		24.600		22.000										
						20.200		18.000		15.900	14.200							
		37.100	35.500	28.200		29.700		26.500		23.500								
						25.200		22.500		19.900								
		28.000		25.000		22.400		20.000		17.700								
						22.800		20.400		18.100		16.100	14.400	12.800	11.400	10.200		
										6.700		6.000	5.400	4.700	4.200	3.350		