

Advanced Engineering

Indexable
Milling
+Modular Series

MMC Hitachi Tool

No. 340

GF1 High Efficiency Finishing
Indexable Special Shape Tool Series
D 16 - 25

70% less
Finishing Time
by larger
Contour Pitch

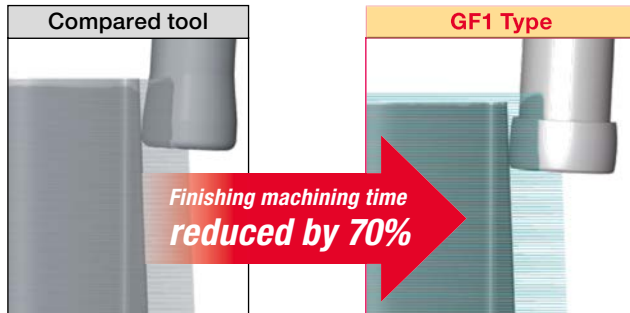
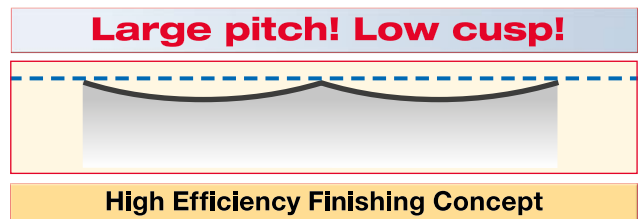
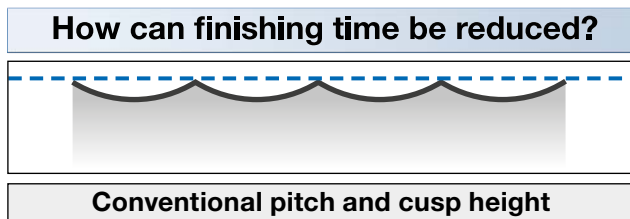


MMC Hitachi Tool Engineering Europe GmbH
www.high-speed-cutting.com



Indexable Milling Tools

GF1 | High Efficiency Finishing Indexable Special Shape Tool Series



Compared tool: D 20mm R1
Corner radius end mill
Cutting conditions
 $V_f = 2,000 \text{ mm/min}$
 $n = 4,500 \text{ min}^{-1}$
 $a_p = 0.2 \text{ mm}$
Machining time simulation =
Approx. 150 min.

High Efficiency Finishing Indexable
Special Shape Tool Series
Max. external diameter D 20mm
Outer peripheral flute 30R
Cutting conditions
 $V_f = 2,000 \text{ mm/min}$
 $n = 4,500 \text{ min}^{-1}$
 $a_p = 0.6 \text{ mm}$
Cutting time = Approx. 40 min.

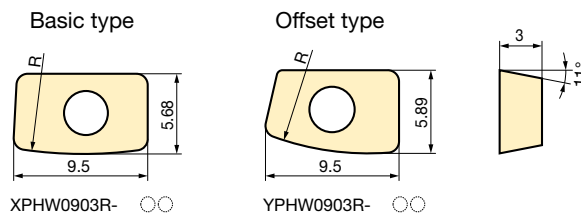


Flute tip shape definitions

Rotation locus shape will be different depending on the combination of insert and tool diameter. Refer to the table below.

Insert	Basic type						Offset type					
	XPHW0903R-20		XPHW0903R-30		YPHW0903R-20		YPHW0903R-30		YPHW0903R-30		YPHW0903R-30	
Tool dia. Dc (mm)	16	20	25	16	20	25	16	20	25	16	20	25
R (mm)	20.14	20	19.93	30.38	30	29.82	20.18	20	19.91	30.33	30	29.81
Rh (mm)	4.75	4.75	4.75	4.75	4.75	4.75	7.25	7.25	7.25	7.25	7.25	7.25
Rr (mm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
A (mm)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
θ	11°	11°	11°	7°	7°	7°	19°	19°	19°	12°	12°	12°

INSERTS | GF1



Inserts	Grade		Size (mm)	Type
	TH315	PN215		
Item code	ID-Code		R	
XPHW0903R-20	WF786	WF788	20	Basic type
XPHW0903R-30	WF787	WF789	30	
YPHW0903R-20	WF790	WF792	20	Offset type
YPHW0903R-30	WF791	WF793	30	

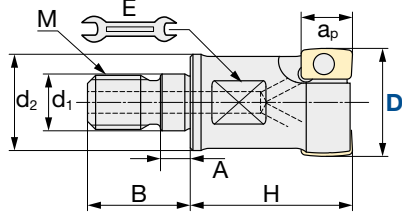
Parts	Clamp Screw			Wrench	
Shape					
	ID Code	Item Code	Torque	ID Code	Item Code
	ET175	250-141(A)	1.1 Nm	ET013	104-T8

Indexable Milling Tools

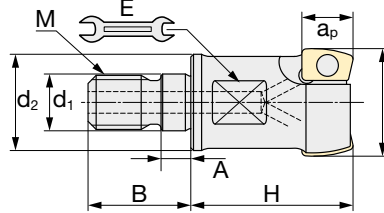
GF1 | High Efficiency Finishing Indexable Special Shape Tool Series

V max High Speed	Semi Finishing	Finishing	HRC 50	No. of Teeth 2-4				
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A - Basic Type



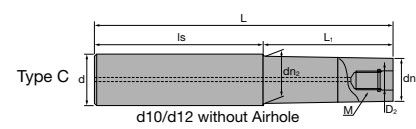
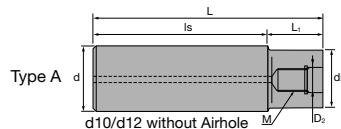
B - Offset Type



Diameter Tolerance	Torque on Screw
0 ~ -0.086 mm	1.1 Nm

Type	ID Code	Item Code	Z	D	H	ap	d1	M	d2	A	B	E	Inserts
Basic type	FH620	GF1G-2016M-2-M8	2	16	25	9.5	8.5	M8	14	5.5	17	10	XPHW0903R-20 XPHW0903R-30
	FH621	GF1G-2020M-3-M10	3	20	30	9.5	10.5	M10	17.8	5.5	19	15	
	FH622	GF1G-2025M-4-M10	4	25	30	9.5	10.5	M10	17.8	5.5	19	15	
	FH623	GF1G-2025M-4-M12	4	25	35	9.5	12.5	M12	22.5	5.5	22	17	
Offset type	FH624	GF1T-2016M-2-M8	2	16	25	9.5	8.5	M8	14	5.5	17	10	YPHW0903R-20 YPHW0903R-30
	FH625	GF1T-2020M-3-M10	3	20	30	9.5	10.5	M10	17.8	5.5	19	15	
	FH626	GF1T-2025M-4-M12	4	25	35	9.5	12.5	M12	22.5	5.5	22	17	

ASC | Carbide Shanks for GF1



ID Code	Item Code	D ₂	M	L	L ₁	Is	dn	dn ₂	d	Type	Cutter body
FH141	ASC16-8.5-95-30	8.5	M8	95	30	65	14.5	15.5	16	C	GF1G2016M-2-M8 GF1T2016M-2-M8
FH258	ASC16-8.5-120-55			120	55						
FH142	ASC16-8.5-140-75			140	75						
FH259	ASC16-8.5-160-95			160	95						
FH260	ASC16-8.5-160-30			160	30						
FH143	ASC20-10.5-120-50Z	10.5	M10	120	50	70	18	-	20	A	GF1G2020M-3-M10 GF1T2020M-3-M10 GF1G2025M-4-M10
FH261	ASC20-10.5-170-90Z			170	90	80	18.5	19.5			
FH262	ASC20-10.5-220-120Z			220	120	100					
FH263	ASC20-10.5-270-150Z			270	150	120					
FH144	ASC20-10.5-220-50Z	10.5	M10	220	50	170	18	-	20	A	GF1G2020M-3-M10 GF1T2020M-3-M10 GF1G2025M-4-M10
FH264	ASC20-10.5-270-50Z			270		220	18.5	19.5			
FH145	ASC25-12.5-145-65	12.5	M12	145	65	80	23	-	25	A	GF1G2025M-4-M12 GF1T2025M-4-M12
FH265	ASC25-12.5-215-115			215	115	100					
FH266	ASC25-12.5-265-145			265	145	120					
FH267	ASC25-12.5-315-195			315	195	120					
FH146	ASC25-12.5-265-65	12.5	M12	265	65	200	23	-	25	A	GF1G2025M-4-M12 GF1T2025M-4-M12
FH268	ASC25-12.5-315-65			315		250					

- SUPER Lock milling chucks or shrink-fit holders can be used.
- SUPER Lock Aufnahmen oder Schrumpffutter können verwendet werden.
- Possono essere utilizzati mandrini a forte serraggio SUPER Lock.

- Aptos para amarrar en portapinzas SUPER Lock.
- Les attachements SUPER Lock peuvent être utilisés.
- Cones hidráulicos de grande aperto e aperto térmico podem ser usados.

- For further information about modular chucks please see our brochure *Indexable Modular Series No. 328.2*
- Weitere Informationen über modulare Werkzeugaufnahmen finden Sie in unserem Prospekt: *Indexable Modular Series No. 328.2*
- Para obtener más información sobre conos modulares consulte nuestro folleto *Indexable Modular Series No. 328.2*
- Per maggiori informazioni riguardanti la gamma dei mandrini avvitabili consultate il catalogo *Indexable Modular Series No. 328.2*

- Pour de plus amples informations concernant les attachements modulaires, voyez SVP notre brochure *Indexable Modular Series No. 328.2*
- Para mais informações sobre Conos Modulares consulte o nosso folheto *Indexable Modular Series No. 328.2*



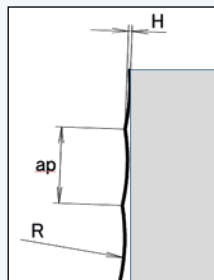
GF1 | Recommended Cutting Conditions

Work piece material	Recommend grade & Target hardness (HRC)			Emulsion	Mist	Air	Tool Diameter OH/Dia ratio Parameter	D 16 (Z2)			D 20 (Z3)			D 25 (Z4)					
	30	40	50					3-5D	5-7D	>7D	3-5D	5-7D	>7D	3-5D	5-7D	>7D			
	Please find optimum value from the attached table.																		
Carbon-Steel Alloy-Steel <200HB	PN215			•	•	•	V _c m/min	600	450	300	600	450	300	600	450	300			
							n min ⁻¹	11937	8952	5968	9549	7162	4775	7639	5730	3820			
							f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	4775	2686	1194	5730	3223	1432	6112	3438	1528			
							a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
							V _c m/min	500	350	250	500	350	250	500	350	250			
Carbon-Steel Alloy-Steel <30 HRC	PN215			•	•	•	n min ⁻¹	9947	6963	4974	7958	5570	3979	6366	4456	3183			
							f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	3979	2089	995	4775	2507	1194	5093	2674	1273			
							a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	400	300	200	400	300	200	400	300	200			
							n min ⁻¹	7958	5968	3979	6366	4775	3183	5093	3820	2546			
Pre-Hardened Steel 30-40 HRC	PN215		TH315	•	•	•	f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	3183	1790	796	3820	2149	955	4074	2292	1019			
							a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	300	200	150	300	200	150	300	200	150			
							n min ⁻¹	5968	3979	2984	4775	3183	2387	3820	2546	1910			
							f _z mm/t	0.15	0.12	0.08	0.15	0.12	0.08	0.15	0.12	0.08			
Hardened Steel 40-50 HRC			TH315	•	•	•	V _f mm/min	1790	955	477	2149	1146	573	2292	1222	611			
							a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	500	300	250	500	300	250	500	300	250			
							n min ⁻¹	9947	5968	4974	7958	4775	3979	6366	3820	3183			
							f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	3979	1790	995	4775	2149	1194	5093	2292	1273			
Stainless Steels SUS	PN215			•	•	•	a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	600	450	300	600	450	300	600	450	300			
							n min ⁻¹	11937	8952	5968	9549	7162	4775	7639	5730	3820			
							f _z mm/t	0.25	0.2	0.15	0.25	0.2	0.15	0.25	0.2	0.15			
							V _f mm/min	5968	3581	1790	7162	4297	2149	7639	4584	2292			
							a _p mm	Please find optimum value from the attached table.											
Cast-Iron GG EN-JL10** EN-GJL-***	PN215		TH315	•	•	•	a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	400	300	200	400	300	200	400	300	200			
							n min ⁻¹	7958	5968	3979	6366	4775	3183	5093	3820	2546			
							f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	3183	1790	796	3820	2149	955	4074	2292	1019			
							a _p mm	Please find optimum value from the attached table.											
Cast-Iron GGG EN-JS10** EN-GJS-***	PN215		TH315	•	•	•	a _p mm	Please find optimum value from the attached table.											
							a _e mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
							V _c m/min	400	300	200	400	300	200	400	300	200			
							n min ⁻¹	7958	5968	3979	6366	4775	3183	5093	3820	2546			
							f _z mm/t	0.2	0.15	0.1	0.2	0.15	0.1	0.2	0.15	0.1			
							V _f mm/min	3183	1790	796	3820	2149	955	4074	2292	1019			
							a _p mm	Please find optimum value from the attached table.											

These values are calculated by this formula:

$$a_p = 2\sqrt{2RH - H^2}$$

R: R-size of the insert
H: Cusp height



Correspondence table - a_p & cusp height

Insert		Cusp height (mm)					
Item code	R-size	0.001	0.002	0.003	0.004	0.005	0.01
XPHW0903R-20	R20	0.4	0.57	0.69	0.8	0.89	1.26
XPHW0903R-30	R30	0.49	0.69	0.85	0.98	1.1	1.55

Always up to date: Please check our P50 QuickFinder



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MMC Hitachi Tool Engineering Europe GmbH

Itterpark 12 · 40724 Hilden · Germany · Phone +49 (0) 21 03-24 82-0 · Fax +49 (0) 21 03-24 82-30
E-Mail info@mmc-hitachitool-eu.com · Internet www.mmc-hitachitool-eu.com
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