Keyless High Torque Timing Pulleys

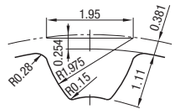
S3M Type

For High Torque Timing Belts, refer to **P.1436**, Open End Belts, refer to **P.1445**.

Keyless Timing Pulleys – S3M Type

Part Number		Material			Surface Treatment		
Belt Width 10 mm	Belt Width 15 mm	Pulley	Flange	Bushing	Pulley	Flange	Bushing
A: 11 W: 15	A: 17 W: 21						
HTLA_ _S3M100	HTLA_ _S3M150	Ultra Duralumin-Based Aluminum Alloy	Aluminum Alloy	1045 Carbon Steel or Equivalent	Clear Anodize		—
HTLK_ _S3M100	HTLK_ _S3M150				Hard Clear Anodize		—
HTLN_ _S3M100	HTLN_ _S3M150				Electroless Nickel Plating		—
HTPL_ _S3M100	HTPL_ _S3M150	1045 Carbon Steel or Equivalent	Low Carbon Steel	1045 Carbon Steel or Equivalent	Black Oxide		
HTLG_ _S3M100	HTLG_ _S3M150				Electroless Nickel Plating		

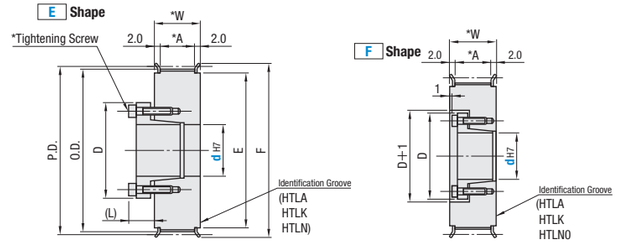
Standard Tooth Profile



Tooth groove dimensions slightly change according to No. of teeth.
(Pitch: 3.0 mm)

- The shaft bore may not have surface treatment.
- Two types of bushings are available: Standard Type (ST Bushings) and Short Type (SH Bushings). Refer to **P.1388**.

Pulley Shape



*For quantity and size of tightening screws with Flange attached, refer to **P.1388**.

Part Number			Pulley Shape	d_{H7} Range (Select Shaft Bore Dia. from Table 1)				P.D.	O.D.	F	E
				S3M100		S3M150					
Type	Teeth	Type, Nominal Width		E Shape (ST Bushing)	F Shape (SH Bushing)	E Shape (ST Bushing)	F Shape (SH Bushing)				
HTLA HTLK HTLN HTPL HTLG	34	S3M100 *A: 11 *W: 15 / S3M150 *A: 17 *W: 21	E F	8	6	8	6	32.47	31.71	40	28
	36			8	6	8	6	34.38	33.62		
	40			8 10 11	8	8 10 11	8	38.20	37.44	44	32
	44			8 10-12 14	8	8 10-12 14	8 10-12	42.02	41.25	48	36
	48			8 10-12 14-16	8	8 10-12 14-16	8 10-12	45.84	45.07	50	38
	50			8 10-12 14-17	8	8 10-12 14-17	8 10-12	47.75	46.98	52	40
	60			8 10-12 14-19	8	8 10-12 14-19	8 10-12	57.30	56.53	61	46
	72			8 10-12 14-20 22 24 25	8	8 10-12 14-20 22 24 25	8 10-12	68.75	67.99	74	58

Table 1: Select Shaft Bore Diameter

dH7	Max. Allowable Torque Nm		D		(L)
	ST Bushing	SH Bushing	ST Bushing	SH Bushing	
6	—	5.6	—	22.5	—
8	16	8.5	25.5	24.5	8.5
10	39	18	30	29	10.5
11	43	20	31	30	
12	48	23	32	31	
14	73	—	35	—	12
15	78		36		
16	83		37		13
17	88		38		
18	154		43		14
19	163		45		
20	171		46		
22	186		48		
24	206	—	50	—	14
25	216		52		

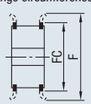
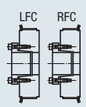
- Electroless nickel plated bushing decreases maximum allowable torque and allowable thrust load by 20–30%

Part Number Example

Part Number	-	Pulley Shape	-	Shaft Bore Dia.
HTPL60S3M100	-	E	-	18

Part Number Alterations

Part Number	-	Pulley Shape	-	Shaft Bore Dia.	-	(BMC / BMR / FC / NFC / LFC / RFC)
HTLA60S3M100	-	E	-	18	-	FC59

Alterations	Flange Cut		Flange Not Swaged	Flange Swaged on One Side	Surface Treatment
Code	FC		NFC	RFC / LFC	BMC / BMR
Spec.	Lowers flange by cutting. FC: 0.5 mm Increment No surface treatment applied on flange circumference. 	FC≥(O.D.)+2 FC≤F-2 **Ordering Code:** FC35	Flange is not Installed. (Flange included) 	Flange installed on the hub side (LFC) or the opposite side (RFC) only prior to shipping. 	Applies electroless nickel plating on a bushing. (Anti-rusting treatment applied to screws). Electroless nickel plated bushing decreases allowable torque by 20–30%. BMC: Non-RoHS-compliant (Screw: Dacrotized treatment applied 4137 Alloy Steel) BMR: RoHS-compliant (Screw: GeoMet coating applied 4137 Alloy Steel)

Keyless High Torque Timing Pulleys

S3M Type – Keyless Bushing with Centering Function

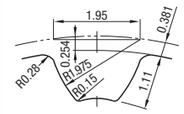
HHAA, Aluminum Bushing Incorporated Type, is approx. 65% lighter than 1045 Carbon Steel Bushing, and thus, is applicable for high speed rotation-based operations.

Keyless Timing Pulleys – S3M Type – Keyless Bushing with Centering Function

RoHS10

Part Number		Material			Surface Treatment		
Belt Width 10 mm	Belt Width 15 mm	Pulley	Flange	Bushing	Pulley	Flange	Bushing
A: 11 W: 15	A: 17 W: 21 Y: 14						
HHAA_ _S3M100	HHAA_ _S3M150	2017 Aluminum Alloy	Aluminum Alloy	A2014	Clear Anodize		
HHTA_ _S3M100	HHTA_ _S3M150	Ultra Duralumin-Based Aluminum Alloy		1045 Carbon Steel or Equivalent	Clear Anodize		—
HHTK_ _S3M100	HHTK_ _S3M150				Hard Clear Anodize		—

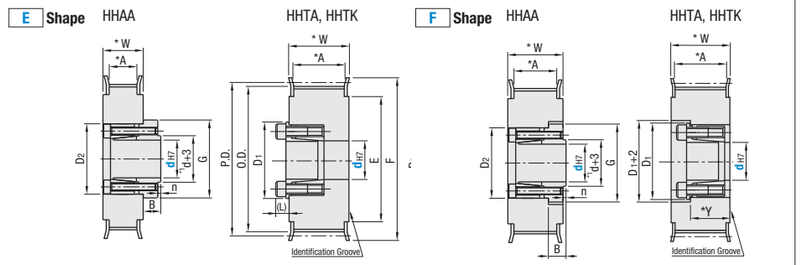
Standard Tooth Profile



Tooth groove dimensions slightly change according to No. of teeth.
(Pitch: 3.0 mm)

- The shaft bore may not have surface treatment.

Pulley Shape



- For installation of flange swaging, refer to **P.1452**, for details of Keyless bushing refer to **P.1456**.

Part Number			Pulley Shape	dH7 Range (Select Shaft Bore Dia. from Table 1)					P.D.	O.D.	F	E
				HHAA		HHTA, HHTK						
Type	Number of Teeth	Type / Nominal Width		S3M100	S3M150	S3M100	S3M150					
				E Shape	F Shape	E Shape	E Shape	F Shape				
HHAA HHTA HHTK	30	S3M100 *A: 11 *W: 15 / S3M150 *A: 17 *W: 21 *Y: 14	E F	6	—	—	—	—	28.65	27.89	32	23
	34			6, 8		6	6	6	32.47	31.71	40	28
	36			6, 8		6	6	6	34.38	33.62		
	40			8, 10	8	8	8	8	38.20	37.44	44	32
	44			8, 10, 12	8, 10, 12	8, 10	8, 10	8, 10	42.02	41.25	48	36
	48			8, 10, 12	8–14	8, 10	8–12	8, 10	45.84	45.07	50	38
	50			8–14	8–15	8, 10	8–14	8, 10	47.75	46.98	52	40
	60			8–14	8–15	8, 10	8–17	8, 10	57.30	56.53	61	46
	72			—	—	8–10	8–19	8–10	68.75	67.99	74	58

Table 1: Select Shaft Bore Diameter

dH7	HHAA					HHTA, HHTK		
	Max. Allowable Torque (N-m)	D2	B	G	n	Max. Allowable Torque (N-m)	D1	(L)
6	4	17	4	20	0.5	12.7	21.5	6
8	6	19	5	22	0.5	19.6	23.5	
10	8	21	5	24	0.5	27.5	25.5	
12	12	24	6	27	1.0	44.1	28.5	6.5
14	18	26	6	29	1.0	63.7	30.5	
15	25	28	7	31	1.2	80.4	31.5	
16	—	—	—	—	—	83.3	33	
17	—	—	—	—	—	92.2	33.5	
18	—	—	—	—	—	95.1	34.5	
19	—	—	—	—	—	98.1	35.5	

HHAA Aluminum Bushing Capability

d_{H7}	Locking Screw				Allowable Thrust Load (kN)
	M x L	Qty	Tightening Torque (N · m)	Surface Treatment	
6	M2.5 x 12	3	0.9	Black Oxide	1.33
8	M2.5 x 14	4	0.9		1.51
10	M2.5 x 14	4	0.9		1.63
12	M2.5 x 15	5	0.9		1.99
14	M2.5 x 15	6	0.9		2.56
15	M3 x 18	4	1.5		3.34
16	M3 x 18	4	1.5		3.34

Weight of Bushing Only (g)

dH7	Aluminum (HHAA)	1045 Carbon Steel or Equivalent (HHT_)
6	8	26
8	11	35
10	12	40
12	17	53
14	19	61
15	24	66
16	25	75

Teeth	Available Types					
	HHAA		HHTA		HHTK	
	S3M100	S3M150	S3M100	S3M150	S3M100	S3M150
30	•	—	—	—	—	—
34	•		•	•	•	•
36	•		•	•	•	•
40	•	•	•	•	•	•
44	•	•	•	•	•	•
48	•	•	•	•	•	•
50	•	•	•	•	•	•
60	•	•	•	•	•	•
72	—	—	•	•	•	•

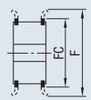
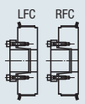
d_{H7}	Available Types	
	Aluminum (HHAA)	1045 Carbon Steel or Equivalent (HHT_)
6	•	•
8	•	•
10	•	•
12	•	•
14	•	•
15	•	•
16	—	•
17		•
18		•
19		•

Part Number Example

Part Number	-	Pulley Shape	-	Shaft Bore Dia.
HHTA60S3M150	-	E	-	15

Part Number Alterations

Part Number	-	Pulley Shape	-	Shaft Bore Dia.	-	(BMC / BMR / FC / NFC / LFC / RFC)
HHTA34S3M150	-	F	-	6	-	BMC

Alterations	Flange Cut		Flange Not Swaged	Flange Swaged on One Side	Surface Treatment
Code	FC		NFC	RFC / LFC	BMC / BMR
Spec.	Lowers flange by cutting. FC: 0.5 mm Increment No surface treatment applied on flange circumference. 	FC≥(O.D.)+2 FC≤F-2 **Ordering Code:** FC35	Flange is not Installed. (Flange included) 	Flange installed on the hub side (LFC) or the opposite side (RFC) only prior to shipping. 	Applies electroless nickel plating on a bushing. (Anti-rusting treatment applied to screws). Electroless nickel plated bushing decreases allowable torque by 20–30%. BMC: Non-RoHS-compliant (Screw: Dacrotized treatment applied 4137 Alloy Steel) BMR: RoHS-compliant (Screw: GeoMet coating applied 4137 Alloy Steel) HHAA is not applicable.