

# Keyless Timing Pulleys Overview

## Features of Keyless Timing Pulleys

- Machining on shafts such as keyway is not required.
- Unnecessity of machining on shafts retains the strength of shaft.
- Easy positioning.

## Installation

- 1 Wipe off the shaft surface and apply oil or grease.  
(Do not use any oil or grease containing molybdenum disulfide agent.)
- 2 Wipe off and apply oil or grease on mating surfaces of pulley and bushing as well. Apply to the threads and seat of the screws also.
- 3 Temporarily assemble the pulley and bushing, then insert the shaft.  
(Do not tighten the bushing before inserting the shaft.)
- 4 After locating, tighten the clamping screws using a torque wrench in the diagonal line order, beginning lightly (at approx. 1/4 of the specified tightening torque).
- 5 Tighten the screws further to an increased torque value (approximately 1/2 of specified torque).
- 6 Tighten the screws at the specified torque.
- 7 Finally, tighten the screws in a circumferential order.

## Cautions on Installation

• Be sure to apply oil or grease to the shaft surfaces, the contact surfaces b/w pulleys, bushings, and the locking screws before installation. If not, the MechaLock may not be tightened firmly; the shaft may slip at rotation.

- Screw tighten the bushing after inserting the shaft.  
(Bushing deforms if the screw is tightened before inserting the shaft.)
- Use a torque wrench to tighten the screws.
- Do not use screws other than the included tightening screws.

## Removal

- Be sure to work after the system is completely shut down.
- Loosen the tightening screws in circumferential order.
- Insert a screw in a hole for removal and tighten evenly.
- Repeat "Installation" process for re-installation.

\* 3-Screw Tightening Type

\* 4-Screw Tightening Type

\* 6-Screw Tightening Type

\* Tapped Hole for Removal

\* Operating Temp.: -20~+80°C

\* SH bushings have 3 tapped holes for removal.

Material Main Body: S45C  
Screw SCM435 (Black Oxide)

No Slits on SH Bushings

## Bushing Dimension Table

### Standard Type Shape E (ST Bushings)

Shaft Bore Dia. d	Qty.	Screw Size	Tapped Hole for Removal	Max. Allowable Torque N·m	Allowable Thrust Load kN	Tightening Torque N·m	D	D <sub>1</sub>	D <sub>2</sub>	d <sub>1</sub>	L	ℓ
8	4	M3x12	M3x2	16	4.0	2.0	25.5	19	10	3.3	15.5	4
10				39			30	22	12			
11	3	M4x16	M4x2	43	5.34	4.0	31	23	13	4.5	16.5	5
12				48			32	24	14			
14				73			35	27	16.6		22	6
15				78			36	28	17.6			
16				83	5.34	4.0	37	29	18.6	4.5		
17				88			38	30	19.6			
18				154			43	33	20.6			
19				163			45	35	22.4		23	7
20				171			46	36	23.4			
22				186	8.74	8.3	48	38	24.6	5.5		
24				206			50	40	26.6			
25				216			52	42	28.4			
28				353			54	44	30.6		24	8
30				382			57	47	33.4	5.5	25	9
32				412	8.74	8.3	59	49	34.7		26.5	
35				451			63	53	38.4		28	
38				686			70	58	42		30.5	10
40				725	12.3	13.7	71	59	43.5	6.6	31.5	11
42				757			74	62	46			
45				1490			84	69	49.5			
48				1600	22.7	34.3	87	72	52.5	8.8	38.5	13
50				1660			89	74	54.5			

### Short Type Shape F (SH Bushings)

Shaft Bore Dia. d	Qty.	Screw Size	Tapped Hole for Removal	Max. Allowable Torque N·m	Allowable Thrust Load kN	Tightening Torque N·m	D	D <sub>1</sub>	D <sub>2</sub>	d <sub>1</sub>	L	ℓ
6				5.6	1.87		22.5	16	8.5			
8				8.5	2.12	1.9	24.5	18	10.5	3.3	10.5	3
10	3	M3x10	M3x3	18	3.59		29	21	12.75			
11				20	3.63	3.9	30	22	13.75	4.4	13	4
12				23	3.76		31	23	14.75			
14				37	5.21		36	26	17.65			
15				39	5.10		37	27	18.65			
16				42	5.17		38	28	19.65			
17				45	5.23	3.9	39	29	20.65	4.4	17	5
18				48	5.28		40	30	21.85			
19				49	5.12		42	32	22.85			
20				97	9.68		46	36	24.1			
22				110	9.98		47	37	25.75			
24				121	10.00		49	39	27.75			
25				124	9.90		51	41	28.75	5.5	19	6
28				141	10.00	7.8	53	43	31.75			
30				149	9.89		56	46	33.75			
32				163	10.12		58	47	35.75			
35				173	9.88		61	50	39.1		20	

kgf=Nx0.101972

• Shaft tolerance g6, shaft surface roughness Ra6.3 are standard. kgf=Nx0.101972  
• When there are keyway and D cut on the installation shaft, transmitting torque is reduced by approximately more than 15%.

## MechaLock Standard Type Incorporated

In addition to the above bushings, MechaLock Standard Type Incorporated Keyless Timing Pulleys (P1491) have been newly added to the lineup. It provides centering function and tolerates average 1.2 times and 2.5 times greater torque than ST bushing and SH bushings respectively.

# Keyless Timing Pulleys - XL

For Timing Belts, see P.1463.



Type	Part Number	Material *1			Surface Treatment		
		Pulley	Flange	Bushing	Pulley	Flange	Bushing
	Belt Width 12.7mm (1/2inch) A:14 W:19 XL050						
MTPLA		A7075	A5052	S45C	Clear Anodize		
MTPL		S45C Equivalent	SPCC	S45C		Black Oxide	

\*1. The above material and accessory might be changed to the ones equivalent to the originals.

### Pulley Shape

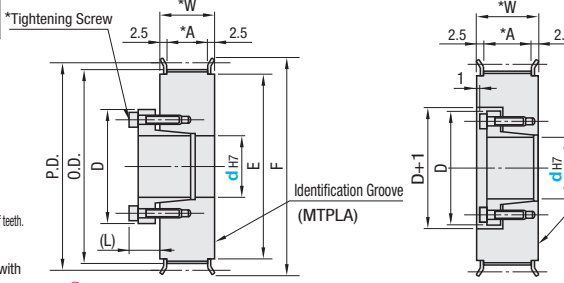


Table 1: Select Shaft Bore Dia.

dh7	Max. Allowable Torque N·m				D (L)
	ST Bushing	SH Bushing	ST Bushing	SH Bushing	
8	16	8.5	25.5	24.5	8.5
10	39	18	30	29	
11	43	20	31	30	10.5
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		
28	353		54		15.5
30	382		57		
32	412		59		16.5

• Electroless nickel plated bushing (Alterations BMC, BMR) decreases maximum allowable torque and allowable thrust load by 20 ~ 30%.

\* For quantity and size of tightening screws with flange installed, see P.1425.  
• Surface treatment may not be applied to shaft bores.  
• Two types of bushings are available: Standard Type (ST Bushings) and Short Type (SH Bushings). See P.1425.

Number of Teeth	20	21	22	24	25	26	28	30	32	34	36	38	40	42	44	46	48	50	60	72
P.D.	32.34	33.96	35.57	38.81	40.43	42.04	45.28	48.51	51.74	54.98	58.21	61.45	64.68	67.91	71.15	74.38	77.62	80.85	97.02	116.43
O.D.	31.83	33.45	35.07	38.30	39.92	41.53	44.77	48.00	51.24	54.47	57.70	60.94	64.17	67.41	70.64	73.87	77.11	80.34	96.51	115.92
F	40	40	45	45	48	48	55	55	61	61	67	67	74	74	80	80	87	87	104	123
E	27	27	30	30	35	35	40	40	45	45	50	50	58	58	60	60	67	67	84	102

Type	Part Number	Number of Teeth	Type, Nominal Width	Pulley Shape	Unit Price			
					Shape E (ST Bushing)	Shape F (SH Bushing)	MTPLA	
							Shape E	Shape F
		20		E	8	-		
		21		E	8	-		
		22		E	8	8		
		24		E	8	8		
		25		E	8, 10-12	8, 10, 11		
		26		E	8, 10-12	8, 10, 11		
		28		E	8, 10-12, 14-17	8, 10-12		
		30		E	10-12, 14-17	10-12		
		32		E	10-12, 14-18	10-12		
		34		E	10-12, 14-18	10-12		
		36		E	10-12, 14-20, 22	10-12		
		38		E	10-12, 14-20, 22, 24, 25, 28, 30	10-12		
		44		E	10-12	10-12		
		46		E	10-12, 14-20, 22, 24, 25, 28, 30, 32	10-12		
		48		E	10-12	10-12		
		50		E	10-12	10-12		
		60		E	10-12, 14-20, 22, 24, 25, 28, 30, 32	10-12		
		72		E	10-12	10-12		

Ordering Example: Part Number - Pulley Shape - Shaft Bore Dia.  
MTPL30XL050 - E - 17

Alterations: Part Number - Pulley Shape - Shaft Bore Dia. (FC, NFC, LFC, RFC, BMC, BMR)  
MTPL30XL050 - E - 17 - FC52.5

Alterations	Flange Cut	No Flange	Single Flange	Surface Treatment
Code	FC	NFC	LFC, RFC	BMC, BMR
Spec.	<p>Low flange by cutting. FC: 0.5mm increment. No surface treatment is applied on flange circumference.</p> <p>FC ≥ (0, D) + 1 FC ≤ F - 2 (Ordering Code) FC35</p>	<p>Flange is not installed. (Flange Included)</p>	<p>Flange is installed on either the bushing side (LFC) or the opposite side (RFC) prior to shipping. (Flange 1 pc. Included)</p>	<p>Applies electroless nickel plating on a bushing. (Antirusting treatment is applied to screws.) • Electroless nickel plated bushing decreases allowable torque by 20 ~ 30%. BMC: Not RoHS Compliant (Screw: SCM435 Dacrotized Treatment) BMR: RoHS Compliant (Screw: SCM435 GeoMet Coating)</p>