Timing Pulleys

MXL Type

For Timing Belts, refer to **P.1434**, Idlers with Teeth, refer to **P.1416**.

Timing Pulleys – MXL Type

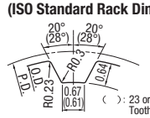
RoHS10

Belt Width 4.8 mm (3/16") A: 6 W:10 L:16.5	Belt Width 6.4 mm (1/4") A: 7.5 W: 11.5 L: 18	Belt Width 9.5 mm (3/8") A: 11 W: 15 L: 22	Belt Width 12.7 mm (1/2") A: 14 W: 18 L: 25	Material: Pulley	Material: Flange	Surface Treatment
ATP_ _MXL019	ATP_ _MXL025	ATP_ _MXL037	ATP_ _MXL050	2000 Series Aluminum Alloy	Aluminum Alloy	Clear Anodize
BTP_ _MXL019	BTP_ _MXL025	BTP_ _MXL037	BTP_ _MXL050			Black Anodize
KTP_ _MXL019	KTP_ _MXL025	KTP_ _MXL037	KTP_ _MXL050			Hard Clear Anodize*
NTP_ _MXL019	NTP_ _MXL025	NTP_ _MXL037	NTP_ _MXL050			Electroless Nickel Plating
—	MTP_ _MXL025	MTP_ _MXL037	—	1045 Carbon Steel or Equivalent	Low Carbon Steel	—
—	MTPB_ _MXL025	MTPB_ _MXL037	—			Black Oxide
—	MTPP_ _MXL025	MTPP_ _MXL037	—			Electroless Nickel Plating
—	STP_ _MXL025	STP_ _MXL037	—	304 Stainless Steel	304 Stainless Steel	—

Flanges are installed. Set screws are included with P, N & C bore hole specification (Not for shape A).

*Hard Anodize Treatment: Film Hardness 300 HV min.

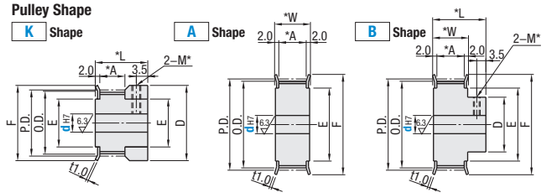
Tooth Profile (ISO Standard Rack Dimensions)



Tooth groove dimensions slightly change according to No. of teeth. **(Pitch: 2.032 mm)**

*Shaft Bore Specifications H (Round Hole), V and F (Stepped Holes) and Y (Both Sides Stepped Hole) do not have tapped holes.

Pulley Shape



Tapped Hole Dimensions (Shaft Bore: P / N / C)

d_{H7} Shaft Bore Inner Dia.	M (Coarse)	Accessories Set Screw
3–5	M3	M3 x 3
6–18	M4	M4 x 3
19–21	M5	M5 x 4

Belt Nominal Width / Dimension

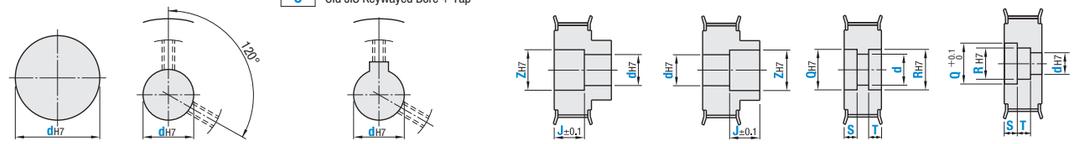
mm	Nominal MXL019	MXL019	MXL037	MXL050
A	6.0	7.5	11.0	14.0
W	10.0	11.5	15.0	18.0
L	16.5	18.0	22.0	25.0

Number of Teeth / Dimension

mm	Number of Teeth 14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30	32	34	36	38	40	42	44	46	48	50	60	72
P.D.	9.06	9.70	10.35	11.00	11.64	12.29	12.94	13.58	14.23	14.88	15.52	16.17	16.82	17.46	18.11	19.40	20.70	21.99	23.29	24.58	25.87	27.17	28.46	29.75	3 1.05	32.34	38.81	46.57
O.D.	8.55	9.19	9.84	10.49	11.14	11.78	12.43	13.07	13.72	14.37	15.02	15.66	16.31	16.96	17.60	18.90	20.19	21.48	22.78	24.07	25.36	26.66	27.95	29.24	30.54	31.84	38.30	46.06
D	12	12	14	14	14	14	9	9	9	11	11	11	12	12	12	14	14	14	16	16	18	18	20	20	22	22	28	30
F	12	12	14	14	14	14	18	18	18	20	20	20	22	22	22	25	25	25	28	28	30	30	32	32	35	35	44	52
E	6	6	8	8	8	8	11	11	11	13	13	13	14	14	14	16	16	16	18	18	20	20	23	23	25	25	32	40

Shaft Bore Specs. The shaft bore may not have surface treatment.

- **H** Round Hole
- **HU** Inch Round Hole
- **P** Round Hole + Tap
- **PU** Inch Round Hole + Tap
- **N** New JIS Keywayed Bore + Tap
- **NU** Inch New JIS Key Groove Hole + Tap
- **C** Old JIS Keywayed Bore + Tap
- **V** Stepped Hole
- **F** Stepped Hole (counterbored holes on the hub side)
- **Y** Both Ends Stepped Hole
- **WB** Two-Stepped Hole



*No tapped holes and set screws

Not available for A Shape.

A Shape has keywayed bores only, not tapped holes.
* For Keyway Dimension Details, refer to **P.1338**.

Not available for D Shape
* No tapped holes and set screws

* Applicable to B Shape only
* No tapped holes and set screws

* Applicable to A Shape only
* Shaft Bore Dia. D is general tolerance
* No tapped holes and set screws
* Q(R)-d>=2

* Applicable to Shape A only.
* No tapped holes or set screws.
* Formulas
* Q-R>=2
* R-WB>=2

Part Number: Type	Teeth	Type Nominal Width	Pulley Shape	Shaft Bore Specs	Shaft Bore Spec. (1mm Increment): H A Shape	H B-K Shape	P B-K Shape	N / C A Shape	N / C B Shape	HU A Shape	HU B-K Shape	PU B-K Shape	NU A Shape	NU B Shape	V / F d_{H7} A Shape	V / F d_{H7} B Shape	V / F Z_{H7} A Shape	V / F Z_{H7} B Shape	J (0.1 mm Inc.) A Shape B Shape	Y/WB d A Shape	Y/WB Q_{H7} / R_{H7} A Shape	Y/WB S / T A Shape
2017 Aluminum Alloy ATP BTP KTP NTP	14	MXL019 *A :6 *W :10 *L :16.5	A K	H HU P PU N NU C V F Y	3 4	3 4	3 4	—	—	A	A	A	—	—	—	—	—	—	—	—	—	—
	15				3 4	3 4	3 4			A	A	A	—	—								
	16*				3 4 5	3 4 5	3 4 5			A B	A B	A B	—	—	3		5		(For A Shape) 2.0≤J≤ W-2.0 (For B Shape) 2.0≤J≤ L-2.0	3	5	3–7 S+T≤W-3
	17				3 4 5	3 4 5	3 4 5			A B	A B	A B	—	—	3		5			3	5	
	18				3 4 5	3 4 5	3 4 5			A B	A B	A B	—	—	3		5			3	5	
	19				3 4 5	3 4 5	3 4 5			A B	A B	A B	—	—	3		5			3	5	
	20*		A B		3–7	3–6	3 4 5			A B	A B	A B	—	—	3 5	3–4	5 7	5–6		3 5	5 7	
	21				3–7	3–6	3 4 5			A B	A B	A B	—	—	3 5	3–4	5 7	5–6		3 5	5 7	
	22*	MXL025 *A :7.5 *W :11.5 *L :18			3–7	3–6	3 4 5			A B	A B	A B	—	—	3 5	3–4	5 7	5–6		3 5	5 7	
	23				3–9	3–7	3–8			A–D	A–C	A–C	—	—	3–7	3–5	5–9	5–7		3–7	5–9	
	24*				3–9	3–7	3–8			A–D	A–C	A–C	—	—	3–7	3–5	5–9	5–7		3–7	5–9	
	25*				3–9	3–7	3–8			A–D	A–C	A–C	—	—	3–7	3–5	5–9	5–7		3–7	5–9	
1045 Carbon Steel or Equivalent MTP MTPB MTPP	26				3–10	3–8	4–9			A–D	A–D	A–D	—	—	3–8	3–6	5–10	5–8		3–8	5–10	
	27				4–10	4–8	4–9			B–D	B–D	B–D	—	—	4–8	4–6	6–10	6–8		4–8	6–10	
	28				4–10	4–8	4–9			B–D	B–D	B–D	—	—	4–8	4–6	6–10	6–8		4–8	6–10	
	30*	MXL037 *A :11 *W :15 *L :22			4–12	4–10	4–9	8	—	B–E	B–E	B–D	D	—	4–10	4–8	6–12	6–10		4–10	6–12	
	32*				4–12	4–10	4–9	8		B–E	B–E	B–D	D	—	4–10	4–8	6–12	6–10		4–10	6–12	
	34				4–12	4–10	4–9	8		B–E	B–E	B–D	D	—	4–10	4–8	6–12	6–10		4–10	6–12	
	36*				5–14	5–12	5–10	8–11	8	C–F	C–E	C–E	D E	D	5–12	5–10	7–14	7–12		5–12	7–14	
	38				5–14	5–12	5–10	8–12	8	C–F	C–E	C–E	D E	D	5–12	5–10	7–14	7–12		5–12	7–14	
	40*				5–16	5–14	5–10	8–13	8 11	C–F	C–F	C–E	D–F	D E	5–14	5–12	7–16	7–14		5–14	7–16	
304 Stainless Steel STP	42	MXL050 *A :14 *W :18 *L :25			5–16	5–14	5–10	8–13	8 11	C–F	C–F	C–E	D–F	D E	5–14	5–12	7–16	7–14		5–14	7–16	
	44				5–19	5–16	5–14	8–16	8–13	C–G	C–G	C–E	D–G	D E	5–17	5–14	7–19	7–16		5–17	7–19	
	46				5–19	5–16	5–14	8–16	8–13	C–G	C–G	C–E	D–G	D E	5–17	5–14	7–19	7–16		5–17	7–19	
	48				5–21	5–18	5–16	8–17	8–14	C–H	C–G	C–F	D–G	D–F	5–19	5–16	7–21	7–18		5–19	7–21	
	50*				5–21	5–18	5–18	8–17	8–14	C–H	C–G	C–F	D–G	D–F	5–19	5–16	7–21	7–18		5–19	7–21	
	60*				5–18	5–24	5–20	8–23	8–19	C–K	C–J	C–H	D–K	D–G	5–26	5–22	7–28	7–24		5–26	7–28	
	72				5–36	5–26	5–22	8–31	8–21	C–M	C–K	C–H	D–L	D–G	5–34	5–24	7–36	7–26		5–34	7–36	

For inch hole dimensions detail information refer to next page. Shaft Bore Dia. 9 is not available for Shaft Bore specification N. STP is available for * marked No. of teeth only.
Shaft Bore Dia. 8, 9, 11, 13, 14, 17, 21–33 are not available for Shaft Bore Specification C. For inch hole dimensions detail information refer to next page. STP is available for * marked No. of teeth only.
Shaft hole specifications N and C for A Shape do not have tapped holes. Shaft Bore Dia. 6.35 is selectable for Shaft Bore specifications H, P, V and F. Z-d≥2 for shaft bore specification V and F.
Q(R)-d≥2 for shaft bore specification Y. Select NK10 when New JIS Keywayed Bore + Tap with shaft bore diameter of 10 and keyway width 4.0 mm (height 1.8 mm) is requested. **P.1338**.

Timing Pulleys

MXL Type, *continued*

Part Number Example

	Part Number	Pulley Shape	Shaft Bore Spec. / Inner Dia.	Z	J	Q	R	S	T
Shaft Bore : H / P / N / C	ATP40MXL025	B	N10						
Shaft Bore: V / F	ATP60MXL037	B	V8	Z14	J13.0				
Shaft Bore: Y	ATP48MXL050	A	Y8			Q16	R16	S5	T5

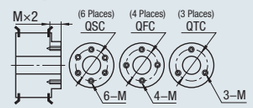
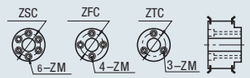
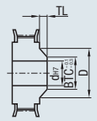
Inch Hole Specifications

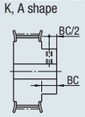
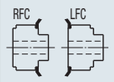
No.	Nominal	Dimension (mm)
A	1/8	3.175
B	3/16	4.763
C	1/4	6.350
D	5/16	7.938
E	3/8	9.525
F	1/2	12.700
G	5/8	15.875
H	3/4	19.050
J	7/8	22.225

No.	Nominal	Dimension (mm)
K	1	25.400
L	1-1/4	31.750
M	1-3/8	34.925
N	1-1/2	38.100
P	1-5/8	41.275
Q	1-3/4	44.450
R	1-7/8	47.625
S	2	50.800

Part Number Alterations

Part Number	Pulley Shape	Shaft Bore Spec. / Inner Dia.	Z	J	Q	R	S	T	(KC90 / QSC / QFC / QTC / KSC / KFC / KTC / BC / NFC / RFC / LFC / FC / TPC / SLH)
ATP72MXL050	B	H12							KSC20 – K4

Alterations	Set Screw Angle	Side Tapped Hole	Side Counterbore Holes	Groove for Retainer Ring	Taper for Retaining Bearing
Code	KC90	QSC / QFC / QTC	ZTC-ZFC-ZSC	SRG	BTC
Spec.	Changes an angle of set screw to 90°. For A shape pulley, the set screw hole is set at around 90° to keep away from peaks. 	Machines tapped hole on the side surface of hub side. (QSC, QFC, QTC: 1 mm Increment) Thickness required: minimum 2 mm A Shape: d+M+4≤QSC(QFC / QTC)≤E-(M+4) B Shape: d+M+4≤QSC(QFC / QTC)≤D-(M+4) Specify KC90 when selecting QFC for the Shaft Bore specifications P and N. The pilot hole for tapping may go through. Not applicable to Shaft Bore Specifications F or Y. QSC is not applicable to the Shaft Bore Specification P and N. Not applicable to K Shape. **M Selection:** M3, M4, M5, M6, M8 **Ordering Code:** QFC28-M4 	Machines countbore holes on the side surface of the hub side. **Ordering Code:** ZTC28-ZM4 **Z/C Selection:** Please specify the hole's manufacturing position (P.C.D.) **ZM Selection:** ZM3, ZM4, ZM5, ZM6, ZM8 Application Notes Not applicable for 1.5GT Minimum thickness is 2mm Conditions vary depending on the shaft hole specifications 	Machines groove for retainer ring in line with the stepped hole of the shaft **SRG Specification:** 2.5-36.5mm (0.5mm increments) Application Notes Minimum thickness is 2mm Applicable to shaft bore specifications V, F only. Use retainer ring groove standards for Z dimension n ≤ J–SRG–m **Ordering Code:** SRG7 	Add taper for retaining bearing inner ring **Ordering Code:** BTC8-TL1.5 Application Notes Applicable to Shape A only. Applicable to shaft bore specifications H, P only. TL < L-W 

Alterations	Hub Shortening	Flange Not Swaged	Flange Swaged on One Side	Flange Cut	Tapped Hole Dimensions	Set Screw Length	Side Through Holes
Code	BC	NFC	RFC / LFC	FC	TPC	SLH	KSC-KTC-KFC
Spec.	Cuts the hub length in 0.5mm increments **Ordering Code:** BC6.5 Application Notes Shaft Bore specification H, V, F: 3≤BC≤L-W Shaft Bore specification P, N, C: M+3≤BC≤L-W Not available for K, A shape 	Flange is not Installed. (Flange included) 	Flange installed on the hub side (RFC) or the opposite side (LFC) only. Same on A Shape Not applicable to K Shape. 	Cuts the outer diameter of the flange in 0.5mm increments **Ordering Code:** FC17 Application Notes FC ≥ (O.D.) + 1 FC ≤ F - 2 No surface treatment applied on flange circumference. 	Changes the tapped hole dimension. Applicable to Shaft Bore specification P, N, C only. Not applicable to A Shape. M / TPC: M3 / M4; M4 / M3, M5; M5 / M4 **Ordering Code:** TPC5	Changes the length of the included set screws. Applicable to Shaft Bore specification P, N, C only. Not applicable to A Shape. Not applicable to Stainless Set Screw / SLH: M3 x 3 / 6; M4 x 3 / 5, 8; M5 x 4 / 6, 10 **Ordering Code:** SLH8	Machines through hole on the side surface of hub side. **Ordering Code:** KTC28-K4.5 **K, C Selection:** Please specify the hole's manufacturing position (P.C.D.) **K Specification:** K4.0-11.0 (0.5mm increments) Application Notes Not available for K shape