

Metal Collars

Flanged, Standard / Precision Grade with Configurable Dimensions

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RoHS10

Ⓢ Depending on thickness and length, 1045 Carbon Steel or Equivalent Hardened Type may be less than 45 HRC min.

Ⓢ Stainless Steel Hardened Type may be discolored due to hardening.

Type		Material	Surface Treatment	Hardness
Standard	Configurable			
—	FTCLS	1018 Carbon Steel or Equivalent	—	—
—	FTCLC	1045 Carbon Steel or Equivalent	Black Oxide	—
—	FTCLMC		Electroless Nickel Plating	
TCLB	FTCLB	1045 Carbon Steel or Equivalent	Black Oxide	—
TCLM	FTCLM		Electroless Nickel Plating	
—	FTCLBB	C3604 Brass (JIS)	—	—
TCLA	FTCLA	2017 Aluminum Alloy	Clear Anodize	—
—	FTCLAB		Black Anodize	
TCLSS	FTCLSS	304 Stainless Steel	—	—
—	FTCLCH	1045 Carbon Steel or Equivalent	Black Oxide	45–50 HRC min.
—	FTCLBH		Electroless Nickel Plating	
—	FTCLSK	O1 Tool Steel	—	55 HRC min.
—	FTCLSH	440C or 420 Stainless Steel	—	45–50 HRC min.

Standard Type
Standard Grade

Dimension Configurable Type
Standard Grade

Precision Grade

Circumference C0.5 or less

Standard Flange (Standard Grade)

Part Number	V	D Selection	L 0.1 mm Increment
TCLB TCLM TCLA TCLSS	2	5 6 8 10	10.0–16.0
	3	5 6 8 10 12	10.0–50.0
	4	6 8 10 12 13 14 15 16 20	
	5	8 10 12 13 14 15 16 20	
	6	8 10 12 13 14 15 16 20 25	
	8	10 12 13 14 15 16 20 25 30	
	10	12 13 14 15 16 20 25 30 35 40 50	
	12	15 16 20 25 30 35 40 50	
	15	20 25 30 35 40 50 60	
	16	20 25 30 35 40 50 60	
20	25 30 35 40 50 60		
25	30 35 40 50 60		
30	40 50 60		

Part Number	V	L10.0–25.0	25.1–50.0	50.1–75.0	75.1–100.0
TCLB TCLM TCLA TCLSS	2	•	•	•	•
	3 4 5	•	•	•	•
	6	•	•	•	•
	8 10	•	•	•	•
	12	•	•	•	•
	15	•	•	•	•
	16	•	•	•	•
20	•	•	•	•	
25	•	•	•	•	
30	•	•	•	•	

Part Number Example Part Number - D - L

TCLB10 - 20 - 60.0

Configurable Dimensions (Standard Grade)

Part Number	V 0.5 mm Increment (V=3 or more)	D	H	T 1 mm Increment	L 0.1 mm Increment
FTCLS FTCLC FTCLB FTCLM FTCLBB FTCLA FTCLAB FTCLSS FTCLCH FTCLBH FTCLMH FTCLSK FTCLSH	Selection 2.0 2.6	4.0–10.0 0.5 mm Increment	6.0–20.0 0.5 mm Increment	1–20 TsL-1 Ⓢ FTCLBB 2sTsL-2	10.0–100.00
		10.5–20 0.5 mm Increment	12.5–30 0.5 mm Increment		
	21–30 1 mm Increment	23–40 1 mm Increment			
	31–40 1 mm Increment	33–50 1 mm Increment			
	41–50 1 mm Increment	43–60 1 mm Increment			
	51–60 1 mm Increment	53–70 1 mm Increment			

- Ⓢ D–V Machining Conditions
10.0≤L≤50.0 → (D–V)/2≥1
50.1≤L≤100.0 → (D–V)/2≥3V≤D–6
- Ⓢ D–V Machining Conditions Ⓢ H–D≥2 Ⓢ D/10≤L≤Vx8 (FTCLSK / FTCLBB)
- 4sD≤10 → VsD–2
10.5sD≤30 → VsD–4
31sD≤60 → VsD–6

Part Number Example Part Number - V - D - H - T - L

FTCLB - V10.5 - D20 - H30 - T4 - L23.8

Metal Collars

Flanged, Standard / Precision Grade with Configurable Dimensions, *continued*

Configurable Dimensions (Precision Grade)

Part Number	V 0.5 mm Increment (V=3 or more)	D	H	T 0.5 mm Increment	L 0.1 mm Increment
FTCLMC FTCLMB FTCLMM FTCMSH	Selection 2.0 2.6 0.5 mm Increment 3.0–55.0	4.0–10.0 0.5 mm Increment	6.0–20.0 0.5 mm Increment	1.0–20.0	10.0–100.0
		10.5–20 0.5 mm Increment	12.5–30 0.5 mm Increment	2.0–20.0	
		21–30 1 mm Increment	23–40 1 mm Increment	3.0–20.0	
		31–40 1 mm Increment	33–50 1 mm Increment		
		41–50 1 mm Increment	43–60 1 mm Increment		
		51–60 1 mm Increment	53–70 1 mm Increment		

Ⓢ D–V Machining Conditions
4sD≤10 → VsD–2
10.5sD≤30 → VsD–4
31sD≤60 → VsD–6

Ⓢ H–D≥2

Ⓢ TsL–1

Ⓢ D/10≤L≤Vx8

Part Number Example Part Number - V - D - H - T - L

FTCLMB - V10.5 - D20 - H30 - T4 - L23.8

Standard Grade

Part Number Alterations Part Number - V - D - H - T - L - (TCB / TCC / TCD / TCE / CC / VM / (VMA) / MC / (WMC) / SLC / VKC)

FTCLB - V10.5 - D20 - H30 - T4 - L23.8 - TCB

Precision Grade

Part Number Alterations Part Number - V - D - H - T - L - (TSA / TSB / TSC / TSD / TSE / CC / VM / (VMA) / MC / (WMC) / SLC / VKC)

FTCLMB - V10.5 - D20 - H30 - T4 - L23.8 - TSB

Ⓢ Not available for Standard Type. Ⓢ Not available for Anodized Products. Ⓢ Not available for the Hardened Products. (Products with hardness indications)

Alterations	Negative Tolerance	Positive Tolerance	Zero Negative Tolerance	Zero Positive Tolerance
<p>Code TCB</p> <p>Ⓢ Available for Standard Grade</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T - 0.1 - 0.3</p> <p>Ordering Code: TCB</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T + 0.3 + 0.1</p> <p>Ordering Code: TCC</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T 0 - 0.2</p> <p>Ordering Code: TCD</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T + 0.2 0</p> <p>Ordering Code: TCE</p>

Alterations	Shoulder Thickness Tolerance	Negative Tolerance	Positive Tolerance	Zero Negative Tolerance	Zero Positive Tolerance
<p>Code TSA</p> <p>Ⓢ Available for Precision Grade</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T ± 0.025</p> <p>Ordering Code: TSA</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T - 0.01 - 0.06</p> <p>Ordering Code: TSB</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T + 0.06 + 0.01</p> <p>Ordering Code: TSC</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T 0 - 0.05</p> <p>Ordering Code: TSD</p>	<p>Changes Shoulder Thickness Tolerance (T).</p> <p>T + 0.05 0</p> <p>Ordering Code: TSE</p>

Alterations	C Chamfering (1-One Side)	Tapping	Set Screw Hole Alteration (1-Set 2-Set)	Slitting	Inner Diameter Tolerance																																																																															
<p>Code CC</p>	<p>Code VM (Coarse) VMA (Fine)</p>	<p>Code MC / WMC</p>	<p>Code SLC</p>	<p>Code VKC</p>																																																																																
<p>Spec.</p> <p>Chamfers C plane. Ordering Code: CC1.5 Ⓢ CC = 0.5 mm Increment Ⓢ CC < (D–V)/2–0.5</p> <p>Ⓢ L≤Mx8</p> <table border="1"> <thead> <tr> <th>Tapped Hole Dia. VM / VMA</th> <th>VM Pitch (Coarse)</th> <th>VMA Pitch (Fine)</th> <th>L max</th> </tr> </thead> <tbody> <tr><td>4</td><td>0.7</td><td>0.5</td><td>20</td></tr> <tr><td>5</td><td>0.8</td><td>0.5</td><td>30</td></tr> <tr><td>6</td><td>1.0</td><td>0.75</td><td>35</td></tr> <tr><td>8</td><td>1.25</td><td>1.0</td><td>40</td></tr> <tr><td>10</td><td>1.5</td><td>1.0</td><td>50</td></tr> <tr><td>12</td><td>1.75</td><td>1.0</td><td>55</td></tr> <tr><td>16</td><td>2.0</td><td>1.5</td><td>90</td></tr> <tr><td>18</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>20</td><td>2.5</td><td>—</td><td>100</td></tr> </tbody> </table> <p>Ⓢ L–T≥MC / WMC + 2 Ⓢ MC / WMC=Select from table below.</p> <table border="1"> <thead> <tr> <th>MC / WMC</th> <th>(D–V)/2</th> </tr> </thead> <tbody> <tr><td>3 4</td><td>3 or More</td></tr> <tr><td>5 6 8</td><td>5 or More</td></tr> <tr><td>10 12</td><td>8 or More</td></tr> </tbody> </table>	Tapped Hole Dia. VM / VMA	VM Pitch (Coarse)	VMA Pitch (Fine)	L max	4	0.7	0.5	20	5	0.8	0.5	30	6	1.0	0.75	35	8	1.25	1.0	40	10	1.5	1.0	50	12	1.75	1.0	55	16	2.0	1.5	90	18	—	—	—	20	2.5	—	100	MC / WMC	(D–V)/2	3 4	3 or More	5 6 8	5 or More	10 12	8 or More	<p>Adds a slitted hole.</p> <p>Ordering Code: SLC Ⓢ Condition of thickness (D–V)/2: as table below. Ⓢ Slit width is fixed.</p> <table border="1"> <thead> <tr> <th>Outer Dia. D</th> <th>SLC</th> <th>(D–V)/2</th> </tr> </thead> <tbody> <tr><td>10.0–20.0</td><td>1</td><td>5 or Less</td></tr> <tr><td>20.5–40</td><td>2</td><td>10 or Less</td></tr> <tr><td>41–</td><td>3</td><td>20 or Less</td></tr> </tbody> </table> <p>Ⓢ D, V and L Dimension tolerances are the values before alteration. Ⓢ They may change after alteration depending on materials.</p>	Outer Dia. D	SLC	(D–V)/2	10.0–20.0	1	5 or Less	20.5–40	2	10 or Less	41–	3	20 or Less	<p>Changes the inner diameter tolerance to H7.</p> <p>Ordering Code: VKC Machining Conditions Ⓢ D≥6 V≥3 L≤Vx5</p> <table border="1"> <thead> <tr> <th>D</th> <th>D–V</th> </tr> </thead> <tbody> <tr><td>6–10</td><td>D–Vs2</td></tr> <tr><td>10.5–20</td><td>D–Vs3</td></tr> <tr><td>21–30</td><td>D–Vs6</td></tr> <tr><td>31–40</td><td>D–Vs8</td></tr> <tr><td>41–50</td><td>D–Vs10</td></tr> <tr><td>51–60</td><td>D–Vs12</td></tr> <tr><td>61–70</td><td>D–Vs14</td></tr> <tr><td>71–80</td><td>D–Vs16</td></tr> <tr><td>81–90</td><td>D–Vs18</td></tr> <tr><td>91–100</td><td>D–Vs20</td></tr> </tbody> </table>	D	D–V	6–10	D–Vs2	10.5–20	D–Vs3	21–30	D–Vs6	31–40	D–Vs8	41–50	D–Vs10	51–60	D–Vs12	61–70	D–Vs14	71–80	D–Vs16	81–90	D–Vs18	91–100	D–Vs20
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