



Westfield Fasteners Product Specification:

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ISO 7380 - Torx Drive Button Head Screws

This product guide contains the specification for metric threaded torx drive button screws, a series of standard parts available from Westfield Fasteners. The basis of this specification is the ISO standard ISO 7380.

Product Description

A torx drive is also known as star, 6 lobe, and hexalobular internal. Torx screws are commonly found on cars, motorcycles, bicycle brake systems, hard disk drives, computer systems and consumer electronics and are becoming increasingly popular. Once, they were typically used in applications requiring tamper resistance; as drivers became more common, specific tamper-resistant variants were developed. The Torx design allows for a higher torque to be exerted than a similarly sized conventional hex socket head. This button head variant is an attractive screw, typically used where aesthetics are important, or where a lower profile domed finish is required.

Scope of ISO Specification

ISO 7380 parts 1 to part 4 specify the dimensions and tolerances for button head and button head flange screws with a machine type thread. Torx drive button screws are a relatively new product and have been manufactured to dimensions based on ISO 7380 part 1 which refers to the more usual socket driven variants. ISO 7380 part 3 has recently been introduced which is a specific standard for torx drive button screws. This new standard features slightly different head heights and key sizes for certain diameters. Off the shelf parts will likely adhere to the older standard for the time being, but please bear in mind that supplies in future may feature revised dimensions.

This standard covers thread diameters from M3 up to and including M12. These button screws are specified in grade 8.8, 10.9 and 12.9 carbon steel, and also in A2 and A4 stainless steel. The mechanical properties of these items are defined in ISO 898 and ISO 3506.

Table 1 below defines the overall dimensions and tolerances of these button head screws. Table 2 describes the ultimate tensile load of this product, and is presented here due to the design of their heads having reduced loadability, as defined in ISO 898 and ISO 3506. Table 3 defines the tolerances on the shank length.

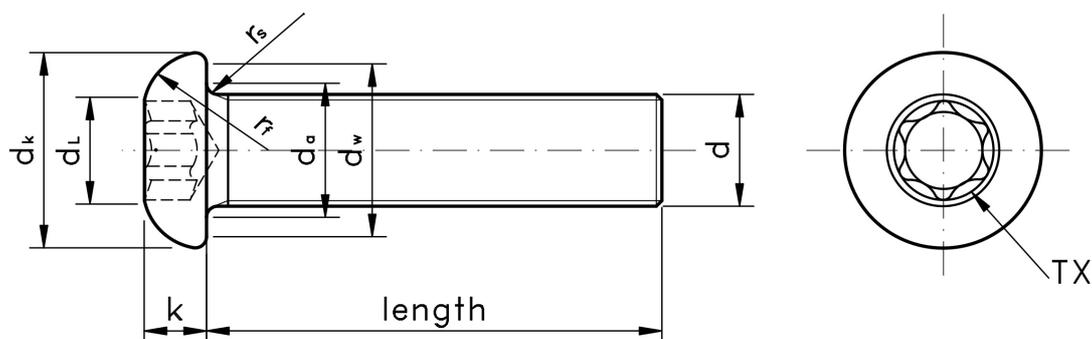


Figure 1: Socket Torx Drive Button Head Screw

Notes to figure 1:

- The tip of the shank may finish with a chamfer or for sizes of M4 or less, rolled.
- The tip of the shank may include up to 2 incomplete threads.

General Notes

Manufacturer and/or material markings may be present on the domed part of the head.

These screws have a reduced loadability in comparison to other screw types. Manufacturers's mark reduced loading capability screws on their heads by adding '0' in front of their grade of steel.

Table 1: Dimensions & Tolerances based on ISO 7380-1 (mm)

Thread Diameter, d		(M2)	(M2.5)	M3	M4	M5	M6	M8	M10	M12
pitch, p		0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75
minimum thread length, b		-	-	18	20	22	24	28	32	36
inner underhead flat diameter, d_a	max.	-	-	3.6	4.7	5.7	6.8	9.2	11.2	13.7
Total Head Diameter, dk	max.	3.4	4.5	5.70	7.60	9.50	10.50	14.00	17.50	21.00
	min.	-	-	5.40	7.24	9.14	10.07	13.57	17.07	20.48
Flat Head Diameter, d_L	ref.	-	-	2.6	3.8	5.0	6.0	7.7	10.0	12.0
Under Head Flat Diameter, d_w	min.	-	-	5.00	6.84	8.74	9.57	13.07	16.57	19.68
head height, k	max.	1.3	1.5	1.65	2.20	2.75	3.30	4.40	5.50	6.60
	min.	-	-	1.40	1.95	2.50	3.00	4.10	5.20	6.24
Dome Radius, r_f	max.	-	-	3.70	4.60	5.75	6.15	7.95	9.80	11.20
	min.	-	-	3.30	4.20	5.25	5.65	7.45	9.20	10.50
Under Head Radius, r_s	min.	-	-	0.10	0.20	0.20	0.25	0.40	0.40	0.60
TX Key Size (as currently manufactured)		6	8	10	20	25	30	40	50	55

Table 2: Reduced Ultimate Tensile Loads based on ISO 7380-1 (N)

Thread Diameter	Strength Class				
	Steel			Stainless Steel	
	8.8	10.9	12.9	70	80
M3	3220	4180	4910	2810	3220
M4	5620	7300	8560	4910	5620
M5	9080	11800	13800	7950	9080
M6	12900	16700	19600	11200	12900
M8	23400	30500	35700	20400	23400
M10	37100	48200	56600	32400	37100
M12	53900	70200	82400	47200	53900
M16	100000	130000	154000	87900	100000

Table 3: Shank Length Tolerance based on ISO 7380-1 (mm)

thread length	+/-
6	0.24
8-10	0.29
12-16	0.35
20-30	0.42
35-50	0.5
55-90	0.6

For further details, please refer to the ISO/DIN standard document for this item.