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Westfield Fasteners Product Specification:

Socket Head Button Screws, to ISO 7380 part 1

This product guide contains the specification for metric threaded socket head button screws as available from Westfield Fasteners. The basis of this specification is the ISO standard ISO 7380, but this specification may include information on sizes and materials that are not covered by the ISO standard but are available.

Product Description

A popular and attractive socket head screw, typically used where aesthetics are important, or where a lower profile domed finish is required. The hex drive is generally smaller than other hex driven ranges and thus the ultimate tightening torque is reduced. These socket button screws are generally manufactured with a fully threaded shank, but occasionally we are provided with stock with a partial thread.

Scope of the ISO Standard

ISO standard 7380 part 1 specifies the tolerances and the permissable variation in form of hexagon socket button head screws, and covers metric thread diameters from M3 up to and including M16. Mechanical properties for these items are defined in ISO 898 and ISO 3506. Table 1 below defines the overall dimensions and tolerances of this screw type. Table 2 defines the tolerances on the shank length, whilst table 3 shows the reduced minimum ultimate tensile loads for this product. The information in table 3 is presented here because due to their head design socket button screws are considered to have reduced loadability over other screw types, as defined in ISO 898 and ISO 3506. ISO 7380 part 2 is a seperate standard that covers hexagon socket button screws with a flange.

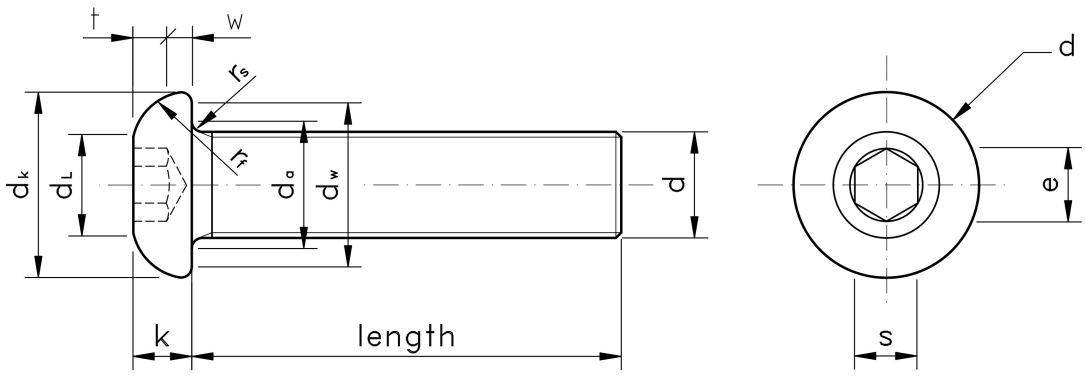

Figure 1: Socket Head Button Screw

Notes to figure 1:

- The small radius between the head and the shank (rs) is very slightly greater for the full threaded version than it is for the partial threaded shanked version. This is an important detail, as the button head may not sit fully flush on the surface, without a countersink or washer present.
- A slight rounding or countersink at the mouth of the socket may be present.
- On the top of the domed head, surrounding the socket, is a small flat area. The diameter of this area (dL) can vary between batches. This dimension is not definitive, and is offered as a reference only.

Variations from ISO 7380 part 1

This specification includes information on hexagon socket button screws with an M2.5 thread. This thread size is not covered in ISO 7380 part 1.

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

Table 1: Dimensions & Tolerances according to ISO 7380-1

Thread, d		(M2.5)	M3	M4	M5	M6	M8	M10	M12	M16
thread pitch (standard metric coarse)		0.45	0.5	0.7	0.8	1.0	1.25	1.5	1.75	2.0
minimum thread length	b ref.	-	18	20	22	24	28	32	36	44
inner underhead flat diameter	d_a max.	-	3.6	4.7	5.7	6.8	9.2	11.2	13.7	17.7
head diameter	d_k max.	4.5	5.70	7.60	9.50	10.50	14.00	17.50	21.00	28.00
	d_k min.	-	5.40	7.24	9.14	10.07	13.57	17.07	20.48	27.48
flathead diameter	d_L ref.	-	2.6	3.8	5.0	6.0	7.7	10.0	12.0	16.0
shank diameter	d_s max.	-	3	4	5	6	8	10	12	16
	d_s min.	-	2.86	3.82	4.82	5.82	7.78	9.78	11.73	15.73
outer underhead flat diameter	d_w min.	-	5.00	6.84	8.74	9.57	13.07	16.57	19.68	26.68
socket width across corners	e min.	-	2.303	2.873	3.443	4.583	5.723	6.863	9.149	11.429
head height	k max.	1.5	1.65	2.20	2.75	3.30	4.40	5.50	6.60	8.80
	k min.	-	1.40	1.95	2.50	3.00	4.10	5.20	6.24	8.44
dome radius	r_f max.	-	3.70	4.60	5.75	6.15	7.95	9.80	11.20	15.30
	r_f min.	-	3.30	4.20	5.25	5.65	7.45	9.20	10.50	14.50
underhead radius	r_s min.	-	0.10	0.20	0.20	0.25	0.40	0.40	0.60	0.60
	r_t min.	-	0.30	0.40	0.45	0.50	0.70	0.70	1.10	1.10
socket width across flats	s nom.	1.5	2	2.5	3	4	5	6	8	10
	s max.	-	2.080	2.580	3.080	4.095	5.140	6.140	8.175	10.175
	s min.	-	2.020	2.520	3.020	4.020	5.020	6.020	8.025	10.025
socket depth	t min.	-	1.04	0.30	0.38	0.74	1.05	1.45	1.63	2.25
	w min.	-	0.20	0.30	0.38	0.74	1.05	1.45	1.63	2.25

Table 2: Shank Length Tolerance according to ISO 7380-1

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

Table 3: Reduced Ultimate Tensile Loads according to ISO 7380-1

-	Strength Class				
thread	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

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