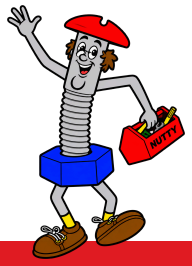
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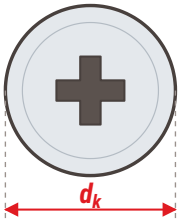
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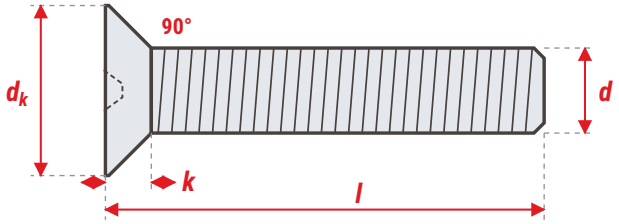


PRODUCT DATA SHEET

Metric Phillips Flat Head Machine Screws







- **Metric Phillips flat head (countersunk) machine screws** to **DIN 965 H** / ISO 7046-1: 90° head that sits flush in a countersunk hole.
- **Material:** steel, property **Class 4.8** to **ISO 898-1** (the standard steel class for DIN 965).
- **Thread:** standard (coarse) pitch, 6g. Stocked M3 through M8; M2, M2.5 and M10 shown for reference.
- **Finish:** clear zinc plated. See 5.0 for the sizes and lengths we stock.

1.0 Dimensions DIN 965 H / ISO 7046-1, millimeters

Size d	Pitch P	d_k Head Dia.	k Head Height	Phillips Recess	b Thread Length	Tap Drill	Clearance Hole
		Max	Max	Size	Min		
M2	0.4	3.8	1.2	PH0	25	1.6	2.4
M2.5	0.45	4.7	1.5	PH1	25	2.05	2.9
M3	0.5	5.5	1.65	PH1	25	2.5	3.4
M4	0.7	8.4	2.7	PH2	38	3.3	4.5
M5	0.8	9.3	2.7	PH2	38	4.2	5.5
M6	1.0	11.3	3.3	PH3	38	5.0	6.6
M8	1.25	15.8	4.65	PH4	38	6.8	9.0
M10	1.5	18.3	5.0	PH4	38	8.5	11.0

l = overall length, including the head. d_k = theoretical sharp-edge head diameter; actual heads are slightly smaller. b min for longer screws; stocked lengths are fully threaded. Tap drill for coarse thread; clearance hole = ISO 273 medium fit.

2.0 Chemical Composition ISO 898-1, % by weight (cast analysis)

Class	Material	Carbon	Phosphorus max.	Sulfur max.	Boron max.	Min. Tempering Temp.
4.8	Carbon steel or carbon steel with additives	0.55 max.	0.050	0.060	–	–

Free-cutting steel is permitted for class 4.8 (S up to 0.34%, P up to 0.11%, Pb up to 0.35%).

Disclaimer: The above is a compilation of DIN 965, ISO 7046-1, ISO 273 and ISO 898-1 data. Loads in 3.1 are calculated minimums for reference, not working loads. The Nutty Company, Inc. has made every effort to present the data accurately. However, The Nutty Company, Inc. cannot be held liable for any claim traceable to any errors, typographical or otherwise, contained herein.

3.0 Mechanical Properties ISO 898-1, at room temperature

Property – Class 4.8	Metric	Inch
Min. tensile strength R_m	420 MPa	60,900 psi
Min. yield strength R_{pf}	340 MPa	49,300 psi
Proof stress S_p	310 MPa	45,000 psi
Vickers hardness HV	130 – 220	–
Rockwell hardness HRB	71 – 95	–
Matching nut (ISO 898-2)	Class 5	–
Approx. inch equivalent	Low-carbon steel machine screw, ASME B18.6.3	–

Head marking: ISO 898-1 does not require property-class marking on cross-recess (Phillips) machine screws, so these heads are normally unmarked.

3.1 Proof & Minimum Tensile Loads ISO 898-1, calculated

Size	Stress Area A_s (mm²)	Proof Load		Min. Tensile Load	
		N	lbf	N	lbf
M2 x 0.4	2.07	642	144	869	195
M2.5 x 0.45	3.39	1,050	236	1,420	319
M3 x 0.5	5.03	1,560	351	2,110	474
M4 x 0.7	8.78	2,720	611	3,690	830
M5 x 0.8	14.2	4,400	989	5,960	1,340
M6 x 1.0	20.1	6,230	1,400	8,440	1,900
M8 x 1.25	36.6	11,300	2,540	15,400	3,460
M10 x 1.5	58.0	18,000	4,050	24,400	5,490

Load = A_s × 310 MPa (proof) or 420 MPa (min. tensile), 3 significant figures; lbf = N × 0.2248. Reference minimums, not working loads.

4.0 Installation Notes

- **Use the right Phillips size:** PH0 for M2, PH1 for M2.5–M3, PH2 for M4–M5, PH3 for M6 and PH4 for M8–M10. A worn or undersize bit cams out and damages the recess.
- **Phillips vs. Pozidriv:** these screws have a Phillips (H) recess. A Pozidriv (Z) bit will not seat properly.
- **Length is overall:** flat head screws are measured from the top of the head to the end of the screw.
- **Countersink:** machine a 90° countersink slightly larger than d_k so the head sits flush. An 82° (inch) countersink will not seat a metric 90° head properly.
- **Do not overtighten:** class 4.8 is a general-purpose strength. For high loads use a socket head cap screw or hex cap screw in a higher class.
- **Zinc plating** gives light to moderate rust protection indoors. For wet or outdoor use, choose stainless steel flat head machine screws.

5.0 Stocked Sizes stock # MFMP...

Size	Lengths in stock, mm overall (DIN 965 H • Phillips • zinc plated)
M3 x 0.5	6, 8, 10, 12, 16, 20
M4 x 0.7	6, 8, 10, 12, 16, 20, 25, 30, 40
M5 x 0.8	8, 10, 12, 16, 20, 25, 30, 35, 40, 50
M6 x 1.0	10, 12, 16, 20, 25, 30, 35, 40, 50
M8 x 1.25	16, 20, 25, 30, 40, 50
Kit	KAMFMP276 – 276 pc. metric Phillips flat head machine screw assortment



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