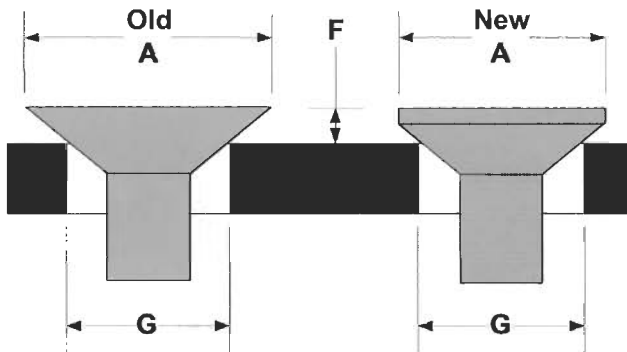


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Inch Flat and Oval Head Screw Head Diameters Changed



The American Society of Mechanical Engineers ASME B18 Committee changed the head diameters of all flat and oval head screws in their 1999 revisions of ASME B18.6.3 for machine screws and ASME B18.6.4 for tapping screws.

What were the changes to the flat and oval head diameters?

In the latest revisions of the ASME standards all sizes and types of flat and oval head machine screws and tapping screws the maximum and minimum head diameters are smaller than in previous editions.

Where can the flat and oval head diameter changes be found?

The new flat and oval screw head dimensions can be found in the ASME B18.6.3 -1999 and ASME B18.6.4-1999. These standards can be purchased directly from the American Society of Mechanical Engineers over the Internet at www.asme.org. Abstracts of these same standards are reproduced in the 7th Edition of Industrial Standards Institute (IFI) FASTENER STANDARDS Book. This book can be purchased from the IFI over the Internet at www.ifi-fasteners.org.

Why were the changes made?

The head diameter changes were made at the request of several major fastener manufacturers in the United States. These manufacturers pointed out that when cold heading flat head screws to the old standards the tooling life was much shorter than when making pan and other head styles of the same screw size.

To successfully make the old flat heads, with near-sharp edges, the cold heading machine tooling had to be set so the cold heading punch almost struck the cold heading die. This close tooling setting created very high pressures between the punches and dies causing them to fatigue and crack much earlier than when making other types of head styles where the tooling components are set further away from one another.

The new flat head with slightly smaller limits enable the screw manufacturer to set the cold heading punch further away from the heading die, thus improving tool life. When running the new, smaller head diameter screws the manufacturers reported that it is easier to keep the head diameters "in control" when using statistical process control (SPC).

The price pressure on fasteners is very intense. If a screw manufacturer unnecessarily uses more tooling, thus increasing costs, their competitiveness is adversely affected.

The ASME B18 Committee decided these requests presented genuine issues that warranted a serious evaluation. That evaluation lead to these changes in the standards. By slightly reducing the flat head maximum and minimum head diameters, the manufacturer's cold heading tooling life is

improved so that it now lasts as long as when making the other standard head styles.

Manufacturing oval head screws presented a similar tooling life problem. The ASME B18 Committee decided to change all of the oval head diameter dimensions to match the new flat head diameters.

Are the flat and oval head screws made to the new dimensions as strong as those manufactured to the old dimensions?

Yes. The committee determined through calculations and by testing that the new screw head dimensions were equal in strength to those made to the old dimensions. The changes would not have been made had any decrease in strength been found.

Do users need to make any changes when countersinking holes to use the new screws?

No. The protrusion heights of the screws were not changed. The protrusion height of flat head screws is what determines if the screw heads will be

flush with, or below, the surface they are seating against.

The acceptance of flat head screw heights has always been determined by the measurement of their protrusion height. The protrusion height requirements for flat head screws in the new standards are identical to those in the old standards. Users of flat head screws do not need to make any changes when preparing countersunk holes when using screws made to the new standard verses using screws made to the old standards.

Why was protrusion gaging for oval head screws added to the new standards?

During the discussions about the flat head screw issue it was pointed out that the measurement of oval head screw head heights was difficult to make repeatedly and that conflicts frequently occurred between screw suppliers and users. The ASME B18 Committee decided that these measurement judgments could be eliminated if oval head screws were measured in the same manner and in the same gages as have long been required for the measurement of flat head screws. It was for this reason that protrusion gaging was added as an inspection requirement for oval head screws.

Those wanting more information and/or details on these standards changes should obtain complete copies of these standards directly from the Society of Mechanical Engineers at www.asme.org.



82 Degree Flat Head							
Size	A				F		G
	Old Head Diameter		New Head Diameter		Protrusion Above Gaging Diameter (Unchanged)		Gaging Diameter (Unchanged)
	Max	Min	Max	Min	Max	Min	
0000	0.043	0.037	0.040	0.035	-	-	-
000	0.064	0.058	0.060	0.055	-	-	-
00	0.092	0.076	0.087	0.080	-	-	-
0	0.119	0.099	0.112	0.096	0.026	0.016	0.078
1	0.146	0.123	0.137	0.120	0.028	0.002	0.101
2	0.172	0.147	0.162	0.144	0.029	0.017	0.124
3	0.199	0.171	0.187	0.167	0.031	0.018	0.148
4	0.225	0.195	0.212	0.191	0.032	0.019	0.172
5	0.252	0.220	0.237	0.215	0.034	0.020	0.196
6	0.279	0.244	0.262	0.238	0.036	0.021	0.220
8	0.332	0.292	0.312	0.285	0.039	0.023	0.267
10	0.385	0.340	0.362	0.333	0.042	0.025	0.313
12	0.438	0.389	0.412	0.380	0.045	0.027	0.362
1/4	0.507	0.452	0.477	0.442	0.058	0.029	0.424
5/16	0.635	0.568	0.597	0.556	0.057	0.034	0.539
3/8	0.762	0.685	0.717	0.670	0.065	0.039	0.653
7/16	0.812	0.723	0.760	0.715	0.073	0.044	0.690
1/2	0.875	0.775	0.815	0.765	0.081	0.049	0.739
9/16	1.000	0.889	0.932	0.878	0.089	0.053	0.851
5/8	1.125	1.002	1.050	0.990	0.097	0.058	0.962
3/4	1.375	1.230	1.285	1.215	0.112	0.067	1.186

Reference: ASME B18.6.3-1999 and ASME B18.6.4-1999