

About the Author/JOE GREENSLADE



Joe Greenslade is President of Greenslade & Company, Inc. in Fort Worth, Texas, a supplier of fastener inspection products, inspection software, and ISO 17025 (A2LA) accredited calibration services. He also provides a variety of consulting services including serving as Expert Witness in fastener related litigations.

Joe has been in the fastener industry in a variety of capacities since 1970. He has written over 220 fastener technology related articles and has spoken to many fastener industry organizations throughout the United States. Joe has been awarded 12 U.S. Patents for fastener inspection devices.

Joe is an active member of the American Society of Mechanical Engineers (ASME), the American Society for Testing and Materials (ASTM), the National Fastener Distributor's Association (NFDA), and a member of the Board of Directors of the American Association for Laboratory Accreditation (A2LA). He is a former member of the Industrial Fasteners Institute (IFI). He was a member of the Fastener Quality Act Task Force representing the fastener industry. Joe also serves on the Screw Thread Improvement Task Force working with government and industry to improve aerospace related thread specifications, and thread gaging and calibration procedures.

Only The GO Size is Different After Coating on External Metric Threads

Of all the questions I answer each month, the one that still occurs with the greatest frequency is related to the proper gaging size requirements for external threads after they are plated or coated. In this article,

I will address the answers regarding external metric threads.

The majority of screw and bolt drawings for metric parts designate "6g Threads" and then go on to specify plating somewhere else on the drawing. Herein lies the source of confusion. Below are the specific statements from the thread standards ISO 965/2 and ASME B1.13M, which state which thread gages should be used on standard threads before and after coating or plating.

ISO 965/2 Statement About Coated Thread Gaging

3 Remarks

For coated threads, the tolerances apply to the parts before coating, unless otherwise stated. After coating, the actual thread profile shall not in any point trans-

gress the maximum material limits for the position H or h respectively.

ASME B1.13 Statement About Coated Thread Gaging

8.2 Material Limits for Coated Threads

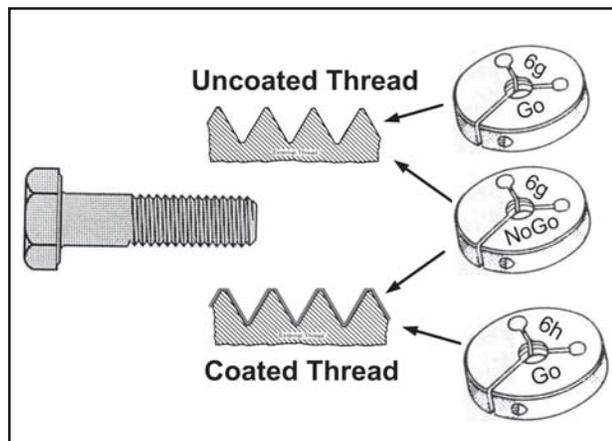
Unless otherwise specified, size limits for standard external thread tolerance Class 6g and 4g6g apply prior to coating. The external thread allowance may thus be used to accommodate the coating thickness on coated parts, provided that the maximum coating thickness is no more than one-fourth of the allowance. Thus, a 6g thread after coating is subject to acceptance using a basic size 6h and 4g6g GO thread, a 4h6h GO thread gage. Minimum material, LO or NOT GO gages would be 6g and 4g6g, respectively. Where external thread has no allowance, or allowance must be maintained after coating, and for standard internal threads, sufficient allowance must be provided prior to coating to assure that finished product threads do not exceed the maximum-material limits specified.

These statements mean that the threads described on a drawing as "6g" are to be inspected using the size limits for **6g before coating or plating**. This means that the Class 6g GO and 6g NOGO limits and gages must be used to inspect and accept the before coated or plated threads.

After the threaded parts are coated or plated, they must be inspected using the **6h GO** thread limits and gages and the **6g NOGO** limits and gages for inspection and acceptance.

A drawing designating a "6g" thread and also designating plating or coating must use the following limits and gages for accepting the threads before and after coating or plating follows on page xxx

The only exception to this rule is if the part drawing specifically states "**6g after coating/plating**." In these rare cases, the before-coat threads must be made smaller than the standard 6g size limits so that after they are coated or plated they will not exceed the stan-



standard 6g GO and 6g NOGO size limits.

As stated in the beginning, this is the most misunderstood rule regarding the inspection of metric screw threads. This misunderstanding is a major source of disputes between threaded product suppliers and purchasers each year. I hope this brief article will help to

clarify this issue for all of those involved in the inspection and acceptance of externally threaded metric screws, bolts, and components.

For more information on this or other fastener related quality issues, contact the author at 800-435-2657 or sales@greensladeandcompany.com. ●

Total Pitch Diameter Allowance for Coated/Plated Metric Threads

Thread Size	6g		6h	Plating Allowance ¹		Maximum Coating Thickness ²	
	NOGO	GO	GO	mm	µm	mm	µm
	Min. PD	Max. PD	Max. PD				
M1.6 X 0.35	1.291	1.354	1.373	0.019	19	0.005	5
M2 X 0.4	1.654	1.721	1.740	0.019	19	0.005	5
M2.5 X 0.45	2.117	2.188	2.208	0.020	20	0.005	5
M3 X 0.5	2.580	2.655	2.675	0.020	20	0.005	5
M3.5 X 0.6	3.004	3.089	3.110	0.021	21	0.005	5
M4 X 0.7	3.433	3.523	3.545	0.022	22	0.005	5
M5 X 0.8	4.361	4.456	4.480	0.024	24	0.006	6
M6 X 1.0	5.212	5.324	5.350	0.026	26	0.006	6
M8 X 1.25	7.042	7.160	7.188	0.028	28	0.007	7
M10 X 1.5	8.862	8.994	9.026	0.032	32	0.008	8
M12 X 1.75	10.679	10.829	10.863	0.034	34	0.008	8
M14 X 2.0	12.503	12.663	12.701	0.038	38	0.010	10
M16 X 2.0	14.503	14.663	14.701	0.038	38	0.010	10
M20 X 2.5	18.134	18.334	18.376	0.042	42	0.011	11
M22 X 2.5	20.164	20.334	20.376	0.042	42	0.011	11
M24 X 3.0	21.803	22.003	22.051	0.048	48	0.012	12
Note 1. Total allowance is the difference between 6g GO and 6h GO.							
Note 2. Maximum coating thickness is equal to 25% of the total allowance.							