Plated and Coated External Threads Are Accepted With 3A Go or 6h Go Gages

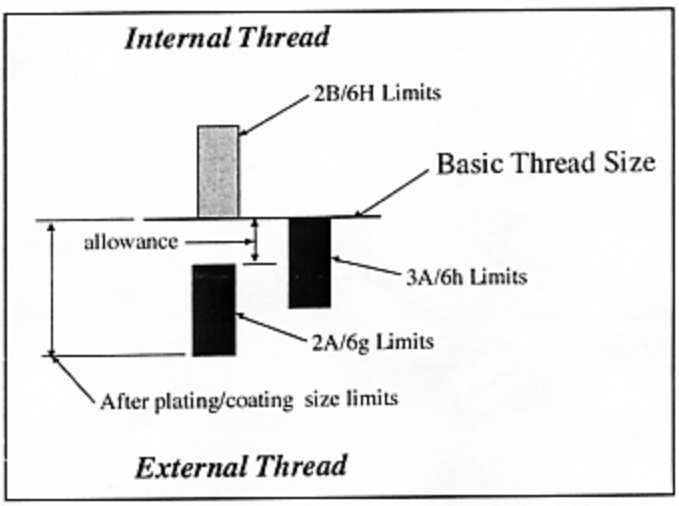
By Joe Greenslade

By far the most frequent question we receive regarding thread gaging relates to the confusion over before and after plating thread gaging requirements. The rules for external thread gaging are shown in Table 1.

These are the rules as stated in ASME B1.1, Section 6 for inch threads and ISO 965/2, Section 3 for metric threads. The reason for these rules is simple. The size of the thread's dimensions must be larger after plating or coating is added than it is before the plating or coating is added.

In external inch threads 3A Go size is referred to as "basic size" as is 6h in metric threads. These create the dividing line between the sizes of the internal and external threads. As long as an external thread does not exceed the maximum sizes of 3A Go for inch threads or 6h Go for metric threads they will assemble with mating internal threads of any size as long as they measure within their required limits of size.

Classes 2A and 6g have within their size standards an area referred to as "allowance." The "allowance" is the size range exactly equal to the difference between 2A Go and 3A Go for inch threads and between 6g Go and 6h Go for metric threads. The term "allowance" in these standards means "allowance for the addition of plating or coating." Unfortunately, the standards have not spelled that out very clearly in the past.



The thickness of plating or coating that can be applied to either 2A or 6g external threads without exceeding the thread's basic size is equal to one-forth of the size of the "allowance" (difference between 2A high limit and 3A high limit, or between 6g high limit and 6h high limit). This is generally in the range of about .0015 to .0002 inches of thickness. If the user requires a plating thickness greater than one-forth the allowance, the before plating or coating threads must be made undersized to assure that the after plated or coated threads will not interfere with their mating internal threads.

Many customer-supplier controversies revolve around this issue of gaging threads that are designated as 2A or 6g on drawings or purchase orders, but are plated and must, therefore, be inspected using 3A or 6h limits for acceptance. Many users simply do not understand how the standards are designed and are fearful that 3A or 6h external threads are going to bind in their corresponding 2B or 6H nuts. This is not a problem, because the standards' authors have long understood this potential problem and have created the standards such that 3A Go size threads never enter the sizes of 2B gaging limits, and correspondingly 6h Go sized threads never enter the size range of 6H internal threads.

Remember, the proper Go gaging for acceptance for plated or coated external threads is: 2A Go before plating or coating and 3A Go after plating or coating for inch threads and 6g Go before plating or coating and 6h after plating or coating for metric threads. ❑

Thread Class	Plain Finish Gaging	Plated or Coated Gaging
Inch: 2A	High limit: 2A Go Low limit: 2A No Go	High limit: 3A Go Low limit: 2A No Go
Metric: 6g	High limit: 6g Go Low limit: 6g No Go	High limit: 6h Go Low limit: 6g No Go

Table 1.

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Joe is an inventor, author, and lecturer. He holds eleven U.S. Patents, has written over 80 technical articles for industrial trade journals, and has spoken frequently at trade association meetings and technical conferences on issues related to industrial quality for the past ten years.

He is an Associate Member of the Industrial Fastener Institute and a member of the American Society of Mechanical Engineers B1 Thread Specification Committee. In 1992, Joe was recognized for his technical and innovative contributions to the fastener industry when, at age 44, he became the youngest person to be inducted into the National Industrial Fastener Show "Hall of Fame."