

Challenge #1

This is the first of three challenges dealing with the mechanical bolted flange joint shown below. Study the design intent and dimensioning scheme as shown. The fasteners are not key locating features, they are only clamping the flanges together.

In this challenge, determine what is needed within the feature control frames for both the clearance holes and the threaded holes without changing any of the given dimensional items.

Use the requirements and information provided. Determine the required tolerances of mating features to ensure that parts assemble correctly and provide manufacturing the most allowable variation. The joint must assemble, and your answer should be based on equal tolerance distribution between mating features.

Send your solution to: <mailto:challenge@tec-ease.com>

Fastener: .250-20 UNC X 1.00 Long (fully thread fastener). Use nominal (Basic) fastener values if values are needed from the table shown below and base values on three significant digits. Assume no positional error between head of fastener and threaded feature.

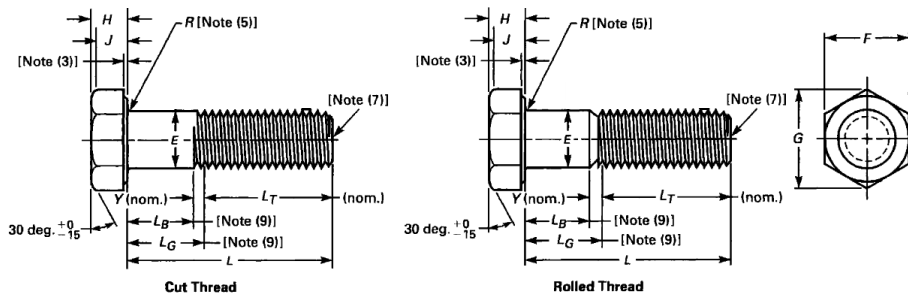


TABLE 4 DIMENSIONS OF HEX CAP SCREWS

Nominal Size or Basic Product Diameter [Note (15)]	E		F			G		H			J	L _T		Y	Circular Runout of Bearing Surface FIM [Note (3)]	
	Body Diameter [Note (6)]		Width Across Flats			Width Across Corners [Note (2)]		Head Height			Wrenching Height [Note (2)]	Thread Length for Screw Lengths [Note (9)]		Transition Thread Length [Notes (9), (10)]		
	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Basic	Max.	Min.		6 in. and Shorter	Over 6 in.			Max.
1/4	0.2500	0.2500	0.2450	7/16	0.438	0.428	0.505	0.488	5/32	0.163	0.150	0.106	0.750	1.000	0.250	0.010

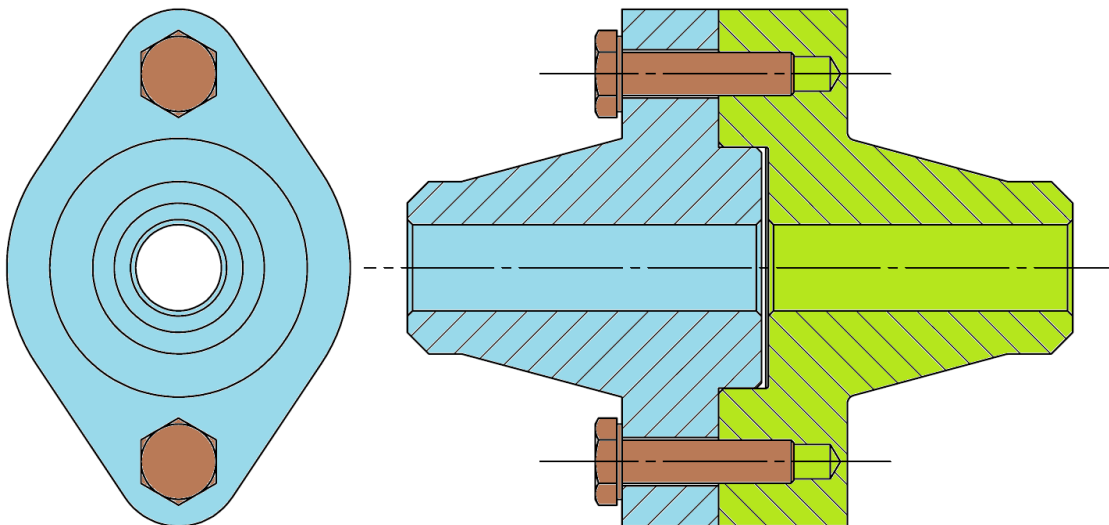


Figure 1, Weld Flange Assembly

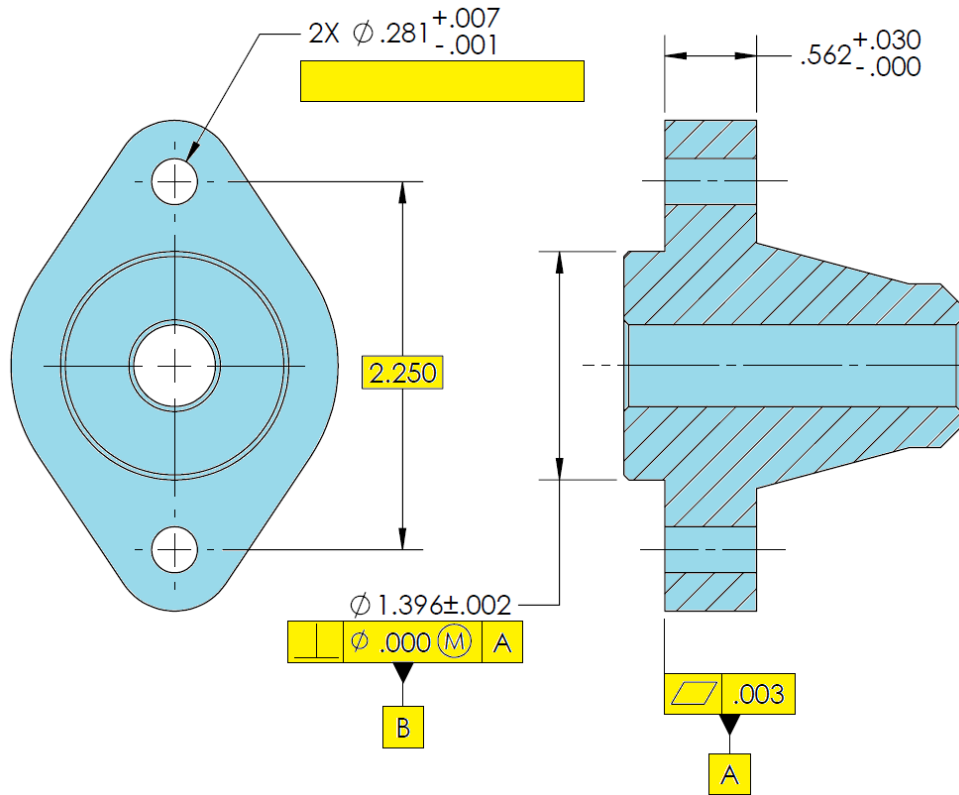


Figure 2, Male Weld Flange

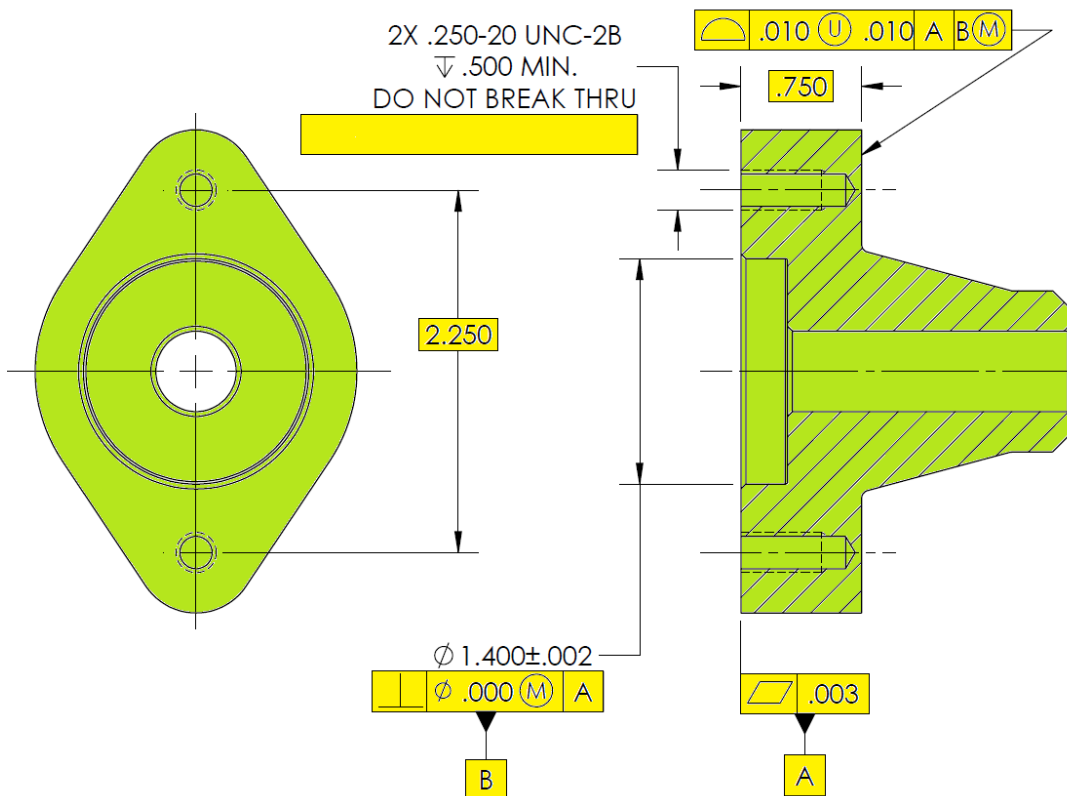


Figure 3, Female Weld Flange