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# Technical Bulletin

## Shaft and Bore Tolerances – TB1001

Utilizing properly sized shafts and bores is critical to the installation and operation of an encoder. A small clearance slip fit<sup>1</sup> is recommended to prevent the possibility of damage during installation and to maintain accuracy.

US Digital produces hubs<sup>1</sup> and shafts with tolerances based on the ANSI B4.1-1967 (R2009) standards, specifically the LC5 (Locational Clearance) fit class, and recommends that customers conform to the same tolerances for best fit and performance when using US Digital encoders.

The chart below lists all standard US Digital encoder sizes and their relative shaft and bore tolerances.

USD Encoder Sizes	Nominal	Bore Tolerance (H7)	Shaft Tolerance (g6)
2mm	0.0787"	+0.0004" -0.0000"	-0.0001" -0.0004"
2.3mm	0.0906"		
2.5mm	0.0984"		
3mm	0.1181"	+0.0005" -0.0000"	-.0002" -.0005"
1/8"	0.1250"		
5/32"	0.1563"		
4mm	0.1575"		
3/16"	0.1875"		
5mm	0.1969"	+0.0006" -0.0000"	-.0002" -.0006"
6mm	0.2362"		
1/4"	0.2500"		
7mm	0.2756"		
5/16"	0.3125"		
8mm	0.3150"		
3/8"	0.3750"	+0.0007" -0.0000"	-.0003" -.0007"
10mm	0.3937"		
12mm	0.4724"		
1/2"	0.5000"		
14mm	0.5512"		
5/8"	0.6250"		
3/4"	0.7500"		
20mm	0.7874"		
7/8"	0.8750"		
25mm	0.9843"		
1"	1.0000"		

<sup>1</sup> Although US Digital push on hubs are not manufactured to these same bore tolerances they are designed to fit on customer shafts following the g6 shaft tolerance listed. Shafts outside the listed range may present trouble with installation of the hub or may not have a tight enough fit for reliable operation. Additionally, our push on hubs are designed to go on shafts with a chamfered lead for easier installation and to prevent damage to the hub bore.