

FED. SUPPLY CLASS

53GP

FASTENER, RECOMMENDED SHANK, HOLE, AND HEAD-TO-SHANK FILLET RADIUS LIMITS FOR

THE SCOPE OF THIS STANDARD DEALS WITH SHANK DIAMETERS OF FASTENERS AND HOLES TO BE USED WITH SUCH FASTENERS. IT IS THE RESULT OF CONSIDERABLE STUDY MADE BY THE NASC AND OFFERS ADVANTAGES TO THE PRODUCERS AND CONSUMERS OF CYLINDRICAL SHAPED ITEMS. IT IS AIMED TOWARD PROVIDING A GREATER DEGREE OF STANDARDIZATION OF

- A. THE FASTENER PRODUCTS
- B. INTERCHANGEABLE USAGE OF SIMILAR PRODUCTS
- C. THE HOLE SIZES AND LIMITS
- D. THE SHANK DIAMETERS, FILLET RADII, AND LIMITS
- E. THE RESULTANT FITS
- F. THE TOOLING, GAGES, ETC. TO PRODUCE THE PRODUCTS
- G. THE DRILLS, REAMERS, ETC. TO PRODUCE THE HOLES
- H. THE INTERCHANGE OF DESIGN AND MANUFACTURING BETWEEN COMPANIES

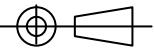
ALTHOUGH ECONOMIC BENEFIT CAN BE ACHIEVED IN THIS PARTICULAR AREA, THE STANDARD DOES NOT COVER ALL POSSIBLE REQUIREMENTS WHICH MAY EXIST FOR CYLINDRICAL SHAPED PARTS AND FITS IN OTHER AREAS. IF APPLICABLE, HOWEVER, ITS USE IS TO BE ENCOURAGED. THE HOLE SIZE AND FILLET RADIUS PORTION OF THIS STANDARD SHOULD BE ESPECIALLY CONSIDERED "RECOMMENDED PRACTICE" AS IT IS EACH COMPANY'S PREROGATIVE TO DETERMINE A CONVENIENT CHANGE PERIOD FOR INCORPORATION OF ALL THE DATA OR PORTIONS THEREOF IN THEIR DESIGNS.

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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
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THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME
PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS FROM THE LAST
REVISION DATE:

ISSUE DATE: MARCH 31, 1956 REVISION DATE: MAY 26, 2010

FORM 09-01	THIRD ANGLE PROJECTION		CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE	REVISION 7
	PROCUREMENT SPECIFICATION	TITLE FASTENER, RECOMMENDED SHANK, HOLE, AND HEAD-TO-SHANK FILLET RADIUS LIMITS FOR	⑦	CLASSIFICATION DESIGN STANDARD

SHANK AND HEAD-TO-SHANK FILLET RADIUS LIMITS

NOMINAL DIAMETER	BEARING BORE (REF.)	SHANK LIMITS				HEAD-TO-SHANK FILLET RADIUS LIMITS	
		A		B	C	PROTRUDING HEAD	100° CSK HEAD
		UNPLATED	PLATED	PLATED	PLATED		
.1640		.1635	.1635	.1635	.1635	.020	.020
		.1630	.1625	.1620	.1610	.010	.010
.1900	.1895	.1895	.1895	.1895	.1895	.020	.020
	.1900	.1890	.1885	.1880	.1870	.010	.010
.2500	.2495	.2495	.2495	.2495	.2495	.020	.020
	.2500	.2490	.2485	.2480	.2470	.010	.010
.3125	.3120	.3120	.3120	.3120	.3120	.020	.020
	.3125	.3115	.3110	.3105	.3095	.010	.010
.3750	.3745	.3745	.3745	.3745	.3745	.025	.030
	.3750	.3740	.3735	.3730	.3720	.015	.015
.4375	.4370	.4370	.4370	.4370	.4370	.025	.030
	.4375	.4365	.4360	.4355	.4345	.015	.015
.5000	.4995	.4995	.4995	.4995	.4995	.030	.030
	.5000	.4990	.4985	.4980	.4970	.020	.015
.5625	.5620	.5615	.5615		.5615	.035	.030
	.5625	.5610	.5605		.5585	.020	.015
.6250	.6245	.6240	.6240		.6240	.040	.030
	.6250	.6235	.6230		.6210	.025	.015
.7500	.7495	.7490	.7490		.7490	.045	
	.7500	.7485	.7480		.7460	.030	
.8750	.8745	.8740	.8740		.8740	.050	
	.8750	.8735	.8730		.8710	.035	
1.0000	.9995	.9990	.9990		.9990	.060	
	1.0000	.9985	.9980		.9960	.045	
1.1250	1.1245	1.1240	1.1240		1.1240	.070	
	1.1250	1.1230	1.1225		1.1200	.055	
1.2500	1.2495	1.2490	1.2490		1.2490	.075	
	1.2500	1.2480	1.2475		1.2450	.060	
1.3750	1.3745	1.3740	1.3740		1.3740	.080	
	1.3750	1.3730	1.3725		1.3700	.065	
1.5000	1.4995	1.4990	1.4990		1.4990	.090	
	1.5000	1.4980	1.4975		1.4950	.070	

NOTES:

- LIMITS ARE MET AFTER PLATING.
- THE SELECTION OF COLUMN A, B OR C FOR AN ITEM SHOULD CONSIDER ITS POTENTIAL END USAGE IN HOLES RECOMMENDED ON SHEET 3.
- FOR SIZES .5000 AND SMALLER, THE MAXIMUM SHANK DIAMETER FOR ALL CLASSES IS EQUAL TO MAXIMUM MAJOR DIAMETER OF THREAD MINUS .0005 AND/OR EQUAL TO MINIMUM BORE DIAMETER.
FOR SIZES .5625 AND LARGER THE MAXIMUM SHANK DIAMETER FOR ALL CLASSES IS EQUAL TO MAXIMUM MAJOR DIAMETER OF THREADS MINUS .0010 AND/OR EQUAL TO MINIMUM BEARING BORE DIAMETER MINUS .0005.
THE MAXIMUM LIMIT IS CONSTANT FOR ALL CLASSES. THE LOWER LIMIT VARIES WITH CLASS.
- IN RECOGNITION OF SOME COMPANIES' PRACTICE OF ACCEPTING HOLES MADE TO .001 BELOW NOMINAL SIZE (EXAMPLE: .250-.001) THE END WHICH ENTERS THE HOLE FIRST (SUCH AS THREADS, GROOVES, ETC.) SHALL BE DIMENSIONED TO PROVIDE CLEARANCE. EXAMPLE FOR COLUMN A LIMITS USING THREADS: THE MAXIMUM MAJOR DIAMETER OF THREADS SHALL BE .001 LESS THAN THE MINIMUM SHANK DIAMETER.

CONSIDERATION SHOULD ALSO BE GIVEN THIS POINT FOR INTERCHANGEABLE USE OF DIFFERENT ITEMS. EXAMPLE: A THREADED ITEM MAY BE USED INTERCHANGEABLY WITH A GROOVED ITEM PROVIDING THE END PORTION CAN BE INSERTED IN THE INTENDED HOLE WITHOUT INTERFERENCE.

COLUMN A REPRESENTS CLOSE LIMITS OF PRECISION MANUFACTURING.

THE UNPLATED PORTION FOR USE AS JOURNALS WHERE GALLING OF PLATING IS DETRIMENTAL.

THE PLATE PORTION FOR USE WHERE ADDED CORROSION PROTECTION IS NEEDED.

THESE PRECISION LIMITS ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH CLOSE LIMIT HOLES WILL PRODUCE A CONNECTION HAVING A MINIMUM CLEARANCE. EXAMPLE: SHEAR AND REVERSING SHEAR LOAD CONNECTIONS AS HEAVY STRUCTURE, HINGE BRACKETS, BEARING, ETC.

COLUMN B REPRESENTS CONTROLLED LIMITS OF MANUFACTURING.

THESE CONTROLLED LIMITS ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH CONTROLLED LIMIT HOLES WILL PRODUCE CONNECTIONS HAVING INTERFERENCE OR COMBINATION OF INTERFERENCE CLEARANCE. EXAMPLE: SHEAR CONNECTION, PERMANENT STRUCTURAL CONNECTIONS, ETC.

COLUMN C REPRESENTS GENERAL PURPOSE LIMITS OF MANUFACTURING.

THESE GENERAL PURPOSE LIMITS ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH GENERAL PURPOSE HOLE LIMITS WILL PRODUCE CONNECTIONS HAVING CLEARANCES OF VARYING DEGREES.

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SHEET 2

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HOLE LIMITS

NOMINAL DIAMETER	A	B	C	D	E	F	G
.1640	.1635 .1645	.1635 .1655	.164 .168	.167 .171	.192 .203	.159 .161	.161 .164
.1900	.1895 .1905	.1895 .1915	.190 .194	.193 .197	.218 .229	.185 .187	.187 .190
.2500	.2495 .2505	.2495 .2515	.250 .254	.253 .257	.279 .291	.245 .248	.247 .250
.3125	.3120 .3130	.3120 .3140	.3125 .3165	.3155 .3195	.342 .354	.307 .310	.309 .313
.3750	.3745 .3755	.3745 .3765	.375 .379	.378 .382	.404 .416	.369 .372	.371 .375
.4375	.4370 .4380	.4370 .4390	.4375 .4425	.4415 .4465	.467 .479	.432 .435	.434 .438
.5000	.4995 .5005	.4995 .5015	.500 .505	.504 .509	.529 .541	.494 .497	.496 .500
.5625	.5620 .5630	.5620 .5640	.5625 .5675	.5665 .5715	.591 .610		
.6250	.6245 .6255	.6245 .6265	.625 .630	.629 .634	.653 .672		
.7500	.7495 .7505	.7495 .7515	.750 .757	.754 .760	.778 .797		
.8750	.8745 .8755	.8745 .8765	.875 .882	.879 .885	.903 .922		
1.0000	.9995 1.0005	.9995 1.0015	1.000 1.010	1.004 1.010	1.028 1.047		
1.1250	1.1245 1.1260	1.1245 1.1270	1.125 1.135	1.129 1.135	1.153 1.172		
1.2500	1.2495 1.2510	1.2495 1.2520	1.250 1.260	1.254 1.260	1.278 1.297		
1.3750	1.3745 1.3760	1.3745 1.3770	1.375 1.385	1.379 1.385	1.403 1.422		
1.5000	1.4995 1.5010	1.4995 1.5020	1.500 1.510	1.504 1.510	1.528 1.547		

- NOTES: (1) THE SELECTION OF COLUMN A THRU G IS OPTIONAL. IN THE CASE OF FASTENER ITEMS, THE SELECTION SHOULD CONSIDER THE RECOMMENDED SHANK DIAMETERS ON SHEET 2.
- (2) SOME COMPANIES' INTERNAL MANUFACTURING PRACTICE PERMITS AN .001 TOLERANCE BELOW THE NOMINAL HOLE SIZE. THIS FEATURE AND THE HOLES TO WHICH IT APPLIES MUST BE DETERMINED BY THE INDIVIDUAL COMPANIES AND INCORPORATED IN APPROPRIATE INSTRUCTIONS (SALVAGE OR OTHERWISE) AS GENERALLY IT IS NOT SPECIFIED ON THE DRAWING.

COLUMN A AND B REPRESENTS CLOSE LIMITS OF PRECISION MANUFACTURING.

THESE PRECISION HOLES ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH PRECISION SHANK DIAMETERS WILL PRODUCE A CONNECTION HAVING A MINIMUM CLEARANCE. MINIMUM INTERFERENCE IS ALSO ATTAINABLE WITH THE USE OF THESE LIMITS. FOR ADDITIONAL LIMITS TO PRODUCE INTERFERENCE, SEE COLUMNS F AND G.

COLUMN C, D AND E REPRESENT GENERAL PURPOSE LIMITS OF MANUFACTURING.

THESE GENERAL PURPOSE HOLES ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH GENERAL PURPOSE SHANK DIAMETERS WILL PRODUCE A CONNECTION HAVING CLEARANCE OF VARYING DEGREES.

COLUMN F AND G REPRESENT CONTROLLED LIMITS OF MANUFACTURING.

THESE CONTROLLED HOLES ARE RECOMMENDED FOR ITEMS WHICH WHEN COUPLED WITH CONTROLLED LIMIT SHANK DIAMETERS WILL PRODUCE A CONNECTION HAVING POSITIVE INTERFERENCE - COLUMN F, OR A COMBINATION OF INTERFERENCE-CLEARANCE - COLUMN G.

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