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Conical Spring Washers — SAE J773b

SAE Standard
Last Revised February 1976

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Society of Automotive Engineers, Inc.
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CONICAL SPRING WASHERS—SAE J773b

SAE Standard

Report of Fasteners Committee approved June, 1961 and last revised February 1976

1. Scope—This SAE Standard covers dimensional, material, and general specifications and methods of test for two types of general purpose conical spring washers, designated type L and type H, for use as loose washers over screws and bolts, and also for use as pre-assembled washers in screw and washer assemblies.

1.1 Both the type L and type H washers are available in three washer series (narrow, regular and wide), having varied proportions designed to fulfill specific application requirements for load distribution.

1.2 Where so specified by the user, washers shall be supplied with peripheral teeth.

1.3 All sizes and types of washers specified in this standard are not necessarily stock production items. Users should consult with manufacturers concerning availability.

2. Designation—Washers shall be specified or designated as shown in the following example:

Washer, Conical, 1/2, SAE Type L, Wide

3. Use and Application—Type L washers are intended for use with screws and bolts equivalent to SAE Grade 1 and 2. Type H washers are intended for use with SAE Grade 5 or equivalent bolts or screws (SAE J429).

3.1 The desired installed position of this washer is as near flat as possible. The flattening will occur at a load equal to approximately 27,500 bolt psi for the Type L washer and 60,000 bolt psi for the Type H washer. The spring return will vary due to the compromises in washer diameter, thickness, and tolerances, which have been made to maintain this standard in a commercial category (see Paragraph 7.1, Recovery Test).

3.2 The relatively high supporting load and spring return makes this washer very effective where bolt tension may be subject to loss due to such factors as compensating for wear, thermal expansion, or compression set.

3.3 When used to span over-size clearance holes, it is recommended that (1) if the full periphery is supported; at least 70% of the washer annular area be bearing or (2) if the periphery is partially supported, as over a slot, the slot should be no wider than 1 1/2 times the I.D. Narrow series should always be fully supported. Insufficient bearing will reduce spring return.

3.4 Washers with peripheral teeth are used for non-slip or positive electrical grounding purposes.

4. Dimensions—Dimensions of Type L and Type H conical spring washers are specified in Table 1.

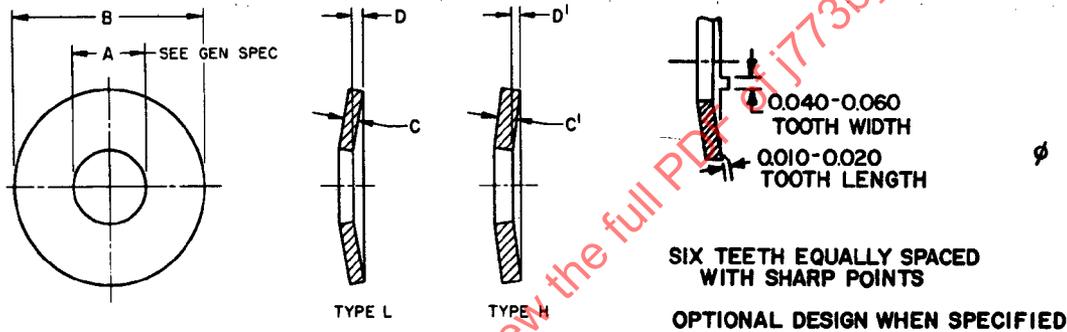


TABLE 1—DIMENSIONS OF CONICAL SPRING WASHERS, IN.

Nominal Screw or Bolt Size	Washer Series	A*		B		Type L					Type H				
		ID		OD		C			D		C'			D'	
		Min	Max	Max	Min	Nom	Max	Min	Min	Max	Nom	Max	Min	Min	Max
						Thickness		Crown Height		Thickness		Crown Height			
6	Narrow	0.151	0.156	0.320	0.307	0.025	0.029	0.023	0.010	0.016	0.035	0.040	0.033	0.015	0.025
	Regular			0.446	0.433	0.030	0.034	0.028	0.014	0.020	0.040	0.046	0.037	0.045	0.025
	Wide			0.570	0.557	0.030	0.034	0.028	0.021	0.031	0.040	0.046	0.037	0.019	0.029
8	Narrow	0.183	0.188	0.383	0.370	0.035	0.040	0.033	0.010	0.016	0.040	0.046	0.037	0.015	0.025
	Regular			0.508	0.495	0.035	0.040	0.033	0.020	0.030	0.045	0.050	0.042	0.016	0.026
	Wide			0.640	0.620	0.035	0.040	0.033	0.027	0.037	0.045	0.050	0.042	0.030	0.040
10	Narrow	0.203	0.208	0.446	0.433	0.035	0.040	0.033	0.010	0.016	0.050	0.056	0.047	0.015	0.025
	Regular			0.570	0.557	0.040	0.046	0.037	0.017	0.027	0.055	0.060	0.052	0.016	0.026
	Wide			0.765	0.743	0.040	0.046	0.037	0.026	0.036	0.055	0.060	0.052	0.024	0.034
12	Narrow	0.230	0.240	0.446	0.433	0.040	0.046	0.037	0.011	0.017	0.055	0.060	0.052	0.015	0.025
	Regular			0.640	0.620	0.040	0.046	0.037	0.023	0.033	0.055	0.060	0.052	0.016	0.026
	Wide			0.890	0.868	0.045	0.050	0.042	0.034	0.044	0.064	0.071	0.059	0.023	0.033
1/4	Narrow	0.271	0.281	0.515	0.495	0.045	0.050	0.042	0.014	0.024	0.064	0.071	0.059	0.015	0.025
	Regular			0.765	0.743	0.050	0.056	0.047	0.023	0.033	0.079	0.087	0.074	0.022	0.032
	Wide			1.015	0.993	0.055	0.060	0.052	0.030	0.040	0.079	0.087	0.074	0.029	0.039
5/16	Narrow	0.334	0.344	0.640	0.620	0.055	0.060	0.052	0.016	0.026	0.079	0.087	0.074	0.016	0.026
	Regular			0.890	0.868	0.064	0.071	0.059	0.031	0.041	0.095	0.103	0.090	0.019	0.029
	Wide			1.140	1.118	0.064	0.071	0.059	0.034	0.044	0.095	0.103	0.090	0.030	0.040
3/8	Narrow	0.396	0.406	0.765	0.743	0.071	0.079	0.066	0.015	0.025	0.095	0.103	0.090	0.015	0.025
	Regular			1.015	0.993	0.071	0.079	0.066	0.033	0.043	0.118	0.126	0.112	0.023	0.033
	Wide			1.265	1.243	0.079	0.087	0.074	0.037	0.047	0.118	0.126	0.112	0.035	0.045
7/16	Narrow	0.470	0.480	0.890	0.868	0.079	0.087	0.074	0.018	0.028	0.128	0.136	0.122	0.016	0.026
	Regular			1.140	1.118	0.095	0.103	0.090	0.031	0.041	0.128	0.136	0.122	0.028	0.038
	Wide			1.530	1.493	0.095	0.103	0.090	0.049	0.059	0.132	0.140	0.126	0.039	0.049
1/2	Narrow	0.530	0.540	1.015	0.993	0.100	0.108	0.094	0.021	0.031	0.142	0.150	0.136	0.020	0.030
	Regular			1.265	1.243	0.111	0.120	0.106	0.033	0.043	0.142	0.150	0.136	0.027	0.037
	Wide			1.780	1.743	0.111	0.120	0.106	0.052	0.062	0.152	0.160	0.146	0.042	0.052

*Not applicable to washers assembled with screw blanks. See General Specifications.