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SPECIFICATION FOR DOUBLE-ENDED OPEN JAW SPANNERS (FORGED)

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BUREAU OF CEYLON STANDARDS

SPECIFICATION FOR DOUBLE-ENDED OPEN JAW SPANNERS (FORGED)

S. L. S. 304 : 1974

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BUREAU OF CEYLON STANDARDS
53, DHARMAPALA MAWATHA,
COLOMBO 3.

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This Standard does not purport to include all the necessary provisions of a contract.

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SRI LANKA STANDARD SPECIFICATION FOR DOUBLE-ENDED OPEN JAW SPANNERS (FORGED)

FOREWORD

This Sri Lanka Standard Specification has been prepared by the Drafting Committee on Spanners. It was approved by the Mechanical Engineering Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 31st October 1974.

Spanners of various shapes and sizes are used for the assembly of threaded fasteners. The most popular type is the open-jaw spanner which holds the hexagon on two flat sides and the jaw is at an angle of 15^0 to the handle.

This standard deals with the requirements for open-jaw spanners for general purposes and those for automobile industry of the type mentioned above. The difference in the torque strengths, required for spanners for automobile industry is considerable, therefore the values of testing torque for these two types are given separately.

The dimensions specified in clause 4 are suitable for use with ISO Metric Hexagon Sizes. Two sets of inch dimensions for spanners suitable for use with Unified Hexagon Sizes and Whitworth Hexagon Sizes have also been included in the Appendices. These latter sizes have been included to cater for the demand that will exist for a few years as a result of inch sized nuts and bolts which are already in service.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated expressing the result of a test, shall be rounded off in accordance with C. S. 102 : 1971. The number of figures to be retained in the rounded off values shall be the same as that of the specified value in this standard.

The assistance derived from the publications of the Indian Standards Institution and the British Standards Institution in the preparation of this standard is acknowledged.

1. SCOPE

This standard covers the requirements for forged, open-jaw spanners of double-ended type for general purposes, and the double-ended higher torque spanners used in the automobile industry, which are suitable for the Hexagon Sizes specified in Sri Lanka Standard Specification for Hexagon Bolts, Screws and Nuts with ISO Metric Threads.

2. MATERIAL

Spanners shall be manufactured from any suitable Carbon or Alloy steel which ensures that they will satisfy the requirements of this standard.

Steels with the following chemical compositions are considered suitable for the manufacture of spanners.

General Purpose Spanners :	% min	% max
Carbon	0.35	0.45
Manganese	0.60	0.90

Automobile Spanners :	% min	% max
Carbon	0.36	0.44
Silicon	0.10	0.35
Manganese	0.60	0.90
Chromium	0.90	1.20

3. HEAT TREATMENT AND HARDNESS

The heat treatment and subsequent hardness of the spanners shall be as given below :

3.1 Normalising—All spanners shall be normalised before hardening.

3.2 Treatment and Hardness—The spanners shall be quenched from a temperature suited to the particular composition and then tempered so that the hardness measured on the face of the head in accordance with C. S. 122 : 1972 and C.S. 145 : 1972, is within the limits specified below :

Hardness Limits

Nominal size (width across flats) mm	General purpose spanners		Automobile spanners	
	HRC	HV	HRC	HV
Up to and including 32	38 to 43	370 to 430	43 to 48	430 to 490
Over 32	34 to 39	330 to 380	38 to 42	360 to 415

4. DIMENSIONS

4.1 The shapes and dimensions of open-jaw spanners for general purposes shall be as given in Table 1.

4.2 The shapes and dimensions of open-jaw spanners for automobiles shall be as given in Table 2.

5. DESIGNATION

5.1 The spanners for Metric Hexagon Sizes shall be designated as follows :

GP for general purposes, or AP for automobile spanners followed by the nominal width across flats in millimetres.

Example : A double-ended open jaw spanner for general purposes, having nominal width across flats S_1 = 19mm and S_2 =22mm shall be designated as :

spanner GP 19 x 22

6. WORKMANSHIP AND FINISH

The spanners shall be well-forged to shape and finished smooth all over. All sharp corners shall be removed. The spanners shall be free from burrs, cracks, seams or other manufacturing defects. The spanners shall be durably protected against rust by plating with Nickel, Chromium or Zinc or by any other suitable process.

7. TORQUE TEST

The spanner to be tested shall be placed over a rigidly held hexagonal test stud which has the same nominal width across-flats as the spanner with a tolerance of h9 (see Appendix D) and with a hardness of not less than 55 HRC. The spanner shall be fully engaged on the test stud with respect to the thickness. The test stud shall touch the bottom of the jaw opening (see fig. 2).

A gradually increasing force shall be applied as near as is practicable to the outer end of the shank, until the torque appropriate to the type and size of the spanner being tested (Tables 1 & 2) is reached. The spanner shall not be struck or jerked during the application of the torque and the load shall always be applied at right angles to the longitudinal axis. The test stud shall not show any sign of deformation during the application of the load. The torque is calculated as the product of the value of the load and the distance from the point of the application of the load to the centre of the test stud.

Each spanner shall be loaded once in each direction during the test. Double ended spanners shall be treated as single ended and shall be tested separately.

At the completion of the test the spanner shall not show any sign of damage or permanent deformation.

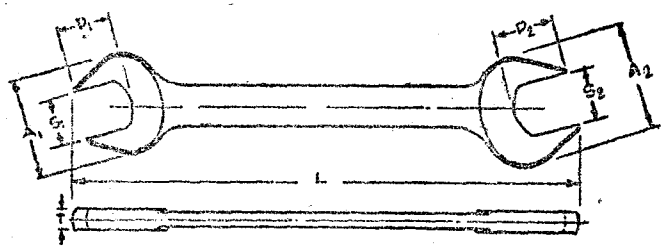
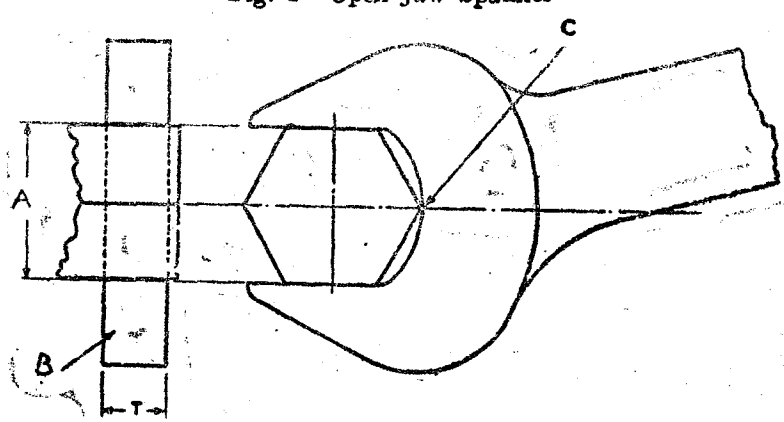


Fig. 1—Open Jaw Spanner



A. Test stud dimension B. Spanner C. See clause 7

Fig. 2—Torque test–Location of Test Stud

8. SAMPLING

Unless otherwise agreed upon between the purchaser and the supplier, the sampling plan as given in Appendix A shall be followed.

9. MARKING

9.1 Each spanner shall be legibly and indelibly marked with the nominal widths across flats and the manufacturer's name or trade mark on the shank.

9.2 Spanners shall, in addition to the marking mentioned in 9.1, be marked with letters 'AP' for Automobile and 'GP' for general purpose.

Table 1 — Dimensions for Open Jaw Spanners for General Purposes

(METRIC HEXAGON SIZES)

Unit : millimetre

Nominal Size (Width Across Flats)	Dimensions Across Jaw Small End (S_1)		Large End (S_2)		Head Thickness (T)		Head Width (Max)		Overall Length (L)		Jaw Depth (min.)		Testing Torque (Clause 7) Small End	Large End
	Max. (1)	Min. (2)	Max. (3)	Min. (4)	Max. (5)	Min. (6)	A_1 (7)	A_2 (8)	Max. (9)	Min. (10)	D_1 (11)	D_2 (12)	kgf. m (13)	kgf. m (14)
*5.5 x 7	5.62	5.52	7.15	7.03	3.18	2.66	14	15	100	90	6.3	8.0	0.25	0.40
(6 x 8)	6.15	6.03	8.15	8.03	3.26	2.66	15	17	110	100	6.9	9.2	0.29	0.55
*7 x 8	7.15	7.03	8.15	8.03	3.26	2.66	15	17	110	100	8.0	9.2	0.40	0.55
*8 x 10	8.15	8.03	10.19	10.04	4.08	3.26	17	22	120	110	9.2	11.5	0.55	1.00
(9 x 11)	9.15	9.03	11.19	11.04	4.48	3.58	19	24	130	115	10.35	12.6	0.75	1.32
*10 x 11	10.19	10.04	11.19	11.04	4.48	3.58	22	24	130	115	11.5	12.6	1.00	1.32
(10 x 12)	10.19	10.04	12.24	12.04	4.89	3.61	22	26	135	120	11.5	13.8	1.00	1.70
*11 x 13	11.19	11.04	13.24	13.04	5.30	4.24	24	28	140	125	12.6	14.9	1.32	2.10
*12 x 14	12.24	12.04	14.27	14.05	5.70	4.56	26	30	150	135	13.8	16.0	1.70	2.65
*13 x 17	13.24	13.04	17.30	17.05	6.92	5.54	28	37	165	150	14.9	19.5	2.10	4.7
(14 x 17)	14.27	14.05	17.30	17.05	6.92	5.54	30	37	165	150	16.0	19.5	2.65	4.7
*17 x 19	17.30	17.05	19.36	19.06	7.74	6.19	37	41	180	165	19.5	21.8	4.7	6.7
*19 x 22	19.36	19.06	22.36	22.06	8.94	7.15	41	48	200	180	21.8	25.2	6.7	10.5
*22 x 24	22.36	22.06	24.36	24.06	9.74	7.79	48	52	230	210	25.2	27.4	10.5	13.7
*24 x 27	24.36	24.06	27.48	27.08	10.99	8.79	52	58	255	230	27.4	30.9	13.7	19.5
*27 x 30	27.48	27.08	30.48	30.08	12.19	9.75	58	65	285	255	30.9	34.3	19.5	26.0
*30 x 32	30.48	30.08	32.48	32.08	12.99	10.39	65	69	285	255	34.3	36.5	26.0	30.5
*32 x 36	32.48	32.08	36.60	36.10	14.64	10.50	69	78	320	290	36.5	41.2	30.5	41.5
*36 x 41	36.60	36.10	41.60	41.10	16.64	11.64	78	88	365	330	41.2	46.8	41.5	57.5
*41 x 46	41.60	41.10	46.60	46.10	18.64	13.05	88	99	400	365	46.8	52.4	57.5	75.0
*46 x 50	46.60	46.10	50.60	50.10	20.24	14.17	99	107	440	400	52.5	56.9	75.0	90.0
*50 x 55	50.60	50.10	55.72	55.12	22.29	15.60	107	118	485	440	56.9	62.7	90.0	107.5
*55 x 60	55.72	55.12	60.72	60.12	24.29	17.00	118	129	525	475	62.7	68.3	107.5	127.0

*ISO recommended preferred combinations.
Combinations in brackets are non-preferred.

Table 2 — Dimensions for Open Jaw Spanners for Automobiles

(METRIC HEXAGON SIZES)

Unit : Millimetre

Nominal Size (Width Across Flats)	Dimensions across Jaw				Head Thickness (T)		Head Width (Max)		Overall Length (L)		Jaw Depth (min)		Testing Torque (Clause 7)	
	Small End (S_1)		Large End (S_2)										Small End	Large End
	Max.	Min.	Max.	Min.	Max.	Min.	A_1	A_2	Max.	Min.	D_1	D_2	Kgf.m	Kgf.m
5.5 x 7	5.62	5.52	7.15	7.03	3.7	3.2	19	20	135	120	6.3	8.0	0.44	0.80
6 x 7	6.15	6.03	7.15	7.03	3.7	3.2	19	20	135	120	6.9	8.0	0.55	0.80
7 x 8	7.15	7.03	8.15	8.03	4.0	3.3	20	22	140	125	8.0	9.2	0.80	1.10
8 x 9	8.15	8.03	9.15	9.03	4.0	3.3	22	24	145	130	9.2	10.35	1.10	1.50
8 x 10	8.15	8.03	10.19	10.04	4.0	3.3	22	27	155	140	9.2	11.5	1.10	2.00
10 x 11	10.19	10.04	11.19	11.04	5.0	4.1	27	30	165	150	11.5	12.6	2.00	2.65
11 x 13	11.19	11.04	13.24	13.04	5.5	4.6	30	34	175	160	12.6	14.9	2.65	4.25
12 x 14	12.24	12.04	14.27	14.05	5.5	4.6	32	35	180	165	13.8	16.0	3.40	5.30
13 x 17	13.24	13.04	17.30	17.05	6.5	5.1	34	42	210	190	14.9	19.5	4.25	9.40
17 x 19	17.30	17.05	19.36	19.06	7.0	5.5	42	47	225	205	19.5	21.8	9.40	13.5
19 x 22	19.36	19.06	22.36	22.06	8.0	6.3	47	52	240	220	21.8	25.2	13.5	21.0
22 x 24	22.36	22.06	24.36	24.06	9.0	7.3	52	56	270	240	25.2	27.4	21.0	27.5
24 x 27	24.36	24.06	27.48	27.08	9.0	7.3	56	63	280	250	27.4	30.9	27.5	30.0
27 x 30	27.48	27.08	30.48	30.08	10.0	7.8	63	66	310	275	30.9	34.3	30.0	52.0
30 x 32	30.48	30.08	32.48	32.08	10.0	7.8	66	71	325	280	34.3	36.5	52.0	61.0
32 x 36	32.48	32.08	36.60	36.10	11.0	8.3	71	80	350	300	36.5	41.2	61.0	83.0
36 x 41	36.60	36.10	41.60	41.20	13.0	9.3	80	88	400	350	41.2	46.8	83.0	115.0
41 x 46	41.60	41.10	46.60	46.10	17.0	11.3	88	96	450	400	46.8	52.4	115.0	150.0
46 x 50	46.60	46.10	50.60	50.10	18.0	11.8	96	105	500	450	52.4	56.9	150.0	180.0

APPENDIX—A

(Clause 7)

SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

A-1 Scale of Sampling

A-1.1 Lot - In any consignment, all the spanners of the same type and designation and manufactured from the same material shall constitute a lot.

A-1.2 For ascertaining the conformity of the lot to the requirements of the specification, tests shall be carrried out for each lot separately. The number of spanners to be selected at random for this purpose shall be in accordance with Col. 1 and 2 of Table 3.

Table 3—Scale of Sampling and Permissible Number of Defectives

Lot Size	For Hardness and Dimensions		For Torque Test	
	Sample Size n	Permissible No. of Defectives	Sub-sample size	Permissible No. of Defectives
(1)	(2)	(3)	(4)	(5)
up to 25	5	0	2	0
26 to 50	7	0	3	0
51 to 100	10	1	5	0
101 to 300	15	1	7	0
301 to 500	25	2	10	1
501 to 800	35	3	15	1
801 to 1,300	50	4	25	2
1,301 and above	75	6	35	3

A.1.3 The spanners shall be selected at random, and to ensure the randomness of selection, the following procedure is recommended for use.

Starting from any spanner in a lot, count them in one order as 1, 2, 3, ... , up to r and so on where r is the integral part of N/n (N being the lot size, and n the sample size indicated in Col. 2 of Table 3). Every rth spanner thus counted shall be selected to constitute the sample.

A-2 Number of Tests and Criteria for Conformity

A-2.1 The spanners selected according to A-1.3, shall be examined for hardness and dimensions as specified in clauses 3,4.1 and 4.2. Any spanner failing to meet the requirements of hardness or dimensions or both shall be considered as defective.

A-2.1.1 If the number of defective spanners found in the sample is less than or equal to the corresponding permissible number of defectives given in Col. 3 of Table 3, then the lot shall be declared as conforming to the requirements of hardness and dimensions.

A-2.2 From those lots which are found satisfactory in accordance with clause A-2.1.1, a sub-sample of the size indicated in Col. 4 of Table 3 shall be subjected to torque test (see Clause 7).

A-2.2.1 If the number of spanners failing in the torque test is less than or equal to the corresponding permissible number of defectives given in Col. 5 of Table 3, then the lot shall be declared as conforming to the requirements of the specification.

APPENDIX—B

SPANNERS FOR UNIFIED HEXAGON SIZES

B-1 Dimensions—The dimensions of spanners for use with unified hexagon sizes shall be as given in Table 4.

B-2 Designation and Marking—Those spanners shall be designated as follows :

The nominal width across flats expressed as a fraction in inches followed by the sign A/F.

The spanners shall be legibly and indelibly marked with the nominal width across flats followed by the letters A/F and the manufacturer's name or trade mark.

B-3 Torque strength—When tested by the method given in clause 7, applying the appropriate torque given in Table 4, the spanner shall not show any sign of damage or permanent deformation.

APPENDIX—C

SPANNERS FOR WHITWORTH (B.S) HEXAGON SIZES

C-1 Dimensions—The dimensions of spanners for use with Whitworth Hexagon Sizes specified in C.S. 97 shall be as given in Table 4.

C-2 Designation and Marking—These spanners shall be designated as follows :

The nominal diameter of the bolt, expressed as a fraction, having the head dimensions in accordance with C.S. 97 followed by the letter W.

The spanners shall also be legibly and indelibly marked with the nominal diameter of the bolt followed by the letter 'W'.

C-3 Torque Strength—When tested by the method given in clause 7 applying the appropriate torque given in Table 5, the spanner shall not show any sign of damage or permanent deformation.

APPENDIX—D

TOLERANCES ON DIMENSIONS OF TEST BOLT (see Clause 8)

D-1 These tolerances are the h9 series of tolerances of the ISO system of "Limits and Fits".

Nominal Size		Tolerance (h9) in 0.001 mm
Over	To	
—	3	0 —25
3	6	0 —30
6	10	0 —36
10	18	0 —43
18	30	0 —52
30	40	0
40	50	—62
50	65	0
65	80	—74
80	100	0
100	120	—87
120	140	0
140	160	
160	180	—100
180	200	0
200	225	
225	250	—115
250	280	0
280	315	—130
315	355	0
355	400	—140
400	450	0
450	500	—155

Table 4 — Dimensions of Spanners for unified Hexagon Sizes

Unit : Inch

Nominal Size (Width Across Flat, Actual)	Dimensions Across Jaw				Head Thickness (T)		Head Width (Max)		Jaw Depth (Min)		Overall Length (L)		Testing Torque (Clause B-3)	
	Small End (S_1)		Large End (S_2)										Small End	Large End
	Max	Min	Max	Min	Max	Min	A_1	A_2	D_1	D_2	Max	Min	kgf m	kgf m
3/16 x 1/4	0.192	0.188	0.256	0.251	0.115	0.105	0.50	0.56	0.22	0.29	2.7	2.2	0.31	0.70
1/14 x 5/16	0.256	0.251	0.319	0.314	0.115	0.105	0.56	0.62	0.29	0.36	3.0	2.5	0.70	1.33
5/16 x 11/32	0.319	0.314	0.350	0.345	0.130	0.105	0.62	0.75	0.36	0.39	3.2	2.7	1.33	1.73
3/8 x 7/16	0.381	0.376	0.445	0.439	0.178	0.142	0.81	0.95	0.43	0.50	4.8	4.1	2.20	3.34
7/16 x 1/2	0.445	0.439	0.509	0.502	0.204	0.163	0.95	1.08	0.50	0.57	5.5	4.7	3.34	4.9
1/2 x 9/16	0.509	0.502	0.573	0.564	0.229	0.183	1.08	1.22	0.57	0.64	6.2	5.3	4.9	6.8
9/16 x 5/8	0.573	0.564	0.636	0.627	0.254	0.204	1.22	1.35	0.64	0.72	6.8	5.9	6.8	9.2
5/8 x 11/16	0.636	0.627	0.699	0.689	0.280	0.224	1.35	1.46	0.72	0.79	7.5	6.5	9.2	12.0
5/8 x 3/4	0.636	0.627	0.764	0.752	0.306	0.244	1.35	1.62	0.72	0.86	8.2	7.1	9.2	15.3
11/16 x 3/4	0.699	0.689	0.764	0.752	0.306	0.244	1.46	1.62	0.79	0.86	8.2	7.1	12.0	15.3
11/16 x 13/16	0.699	0.689	0.827	0.815	0.331	0.265	1.46	1.76	0.79	0.93	8.9	7.6	12.0	19.3
3/4 x 7/8	0.764	0.752	0.889	0.877	0.356	0.284	1.62	1.89	0.86	1.00	9.6	8.2	15.3	23.5
13/16 x 7/8	0.827	0.815	0.889	0.877	0.356	0.284	1.76	1.89	0.93	1.00	9.6	8.2	19.3	23.5
7/8 x 15/16	0.889	0.877	0.952	0.940	0.381	0.305	1.89	2.00	1.00	1.07	10.2	8.8	23.5	28.6
7/8 x 1 1/16	0.889	0.877	1.081	1.066	0.432	0.346	1.89	2.3	1.00	1.22	11.6	10.0	23.5	40.7
15/16 x 1	0.952	0.940	1.014	1.002	0.406	0.324	2.00	2.2	1.07	1.14	10.9	9.4	28.6	34.4
15/16 x 1 1/8	0.952	0.940	1.114	1.128	0.458	0.366	2.00	2.4	1.07	1.29	12.3	10.6	28.6	47.7
1 x 1 1/16	1.014	1.022	1.081	1.066	0.432	0.346	2.2	2.3	1.14	1.22	11.6	10.0	34.4	40.7
1 1/16 x 1 1/8	1.081	1.066	1.144	1.128	0.458	0.366	2.3	2.4	1.22	1.29	12.3	10.6	40.7	47.7
1 1/8 x 1 1/4	1.144	1.128	1.269	1.253	0.508	0.370	2.4	2.7	1.29	1.43	12.6	10.8	47.7	64.0
1 1/4 x 1 7/16	1.269	1.253	1.461	1.441	0.584	0.409	2.7	3.1	1.43	1.64	14.5	11.8	64.0	93.1
1 3/8 x 1 1/2	1.399	1.379	1.524	1.504	0.610	0.421	3.0	3.2	1.57	1.71	15.1	12.3	83.8	101.6
1 3/8 x 1 13/16	1.649	1.629	1.836	1.816	0.734	0.514	3.5	3.9	1.86	2.07	18.2	14.9	119.3	148.9
2 3/16 x 2 3/8	2.215	2.192	2.403	2.380	0.961	0.673	4.7	5.1	2.49	2.70	23.8	19.5	216.2	255.0

Table 5—Dimensions of Spanners for Whitworth Hexagon Sizes

Unit : inch

BS sizes	Dimensions across jaw, W				Head thickness, T.		Head width, H maximum		Jaw depth, D minimum		Overall length, L.		Testing Torque (Clause 6—3)	
	Small end S_1		Large end S_2										Small end kgf m	Larger end kgf m
	Max.	Min.	Max.	Min.	Max.	Min.	A_1	A_2	D_1	D_2	Max.	Min.		
1/4 x 5/16	0.451	0.448	0.533	0.529	0.213	0.171	0.96	1.13	0.51	0.60	5.7	4.9	3.84	5.91
5/16 x 3/8	0.533	0.529	0.608	0.604	0.243	0.195	1.13	1.29	0.60	0.66	6.5	5.6	5.91	8.64
3/8 x 7/16	0.608	0.604	0.720	0.715	0.288	0.230	1.29	1.53	0.68	0.81	7.7	6.7	8.64	13.7
7/16 x 1/2	0.720	0.715	0.830	0.825	0.332	0.266	1.53	1.76	0.81	0.93	8.9	7.7	13.7	20.6
1/2 x 9/16	0.830	0.825	0.932	0.926	0.373	0.298	1.76	1.98	0.93	1.05	10.0	8.6	20.6	28.3
9/16 x 5/8	0.932	0.926	1.022	1.016	0.409	0.327	1.98	2.17	1.05	1.15	11.0	9.5	28.3	36.3
5/8 x 11/16	1.022	1.016	1.114	1.107	0.446	0.356	2.17	2.37	1.15	1.25	12.0	10.3	36.3	47.0
11/16 x 3/4	1.114	1.107	1.214	1.207	0.486	0.388	2.37	2.58	1.25	1.37	12.5	10.5	47.0	59.7
3/4 x 7/8	1.214	1.207	1.316	1.308	0.526	0.401	2.58	2.80	1.37	1.48	13.0	10.7	59.7	74.5
7/8 x 1	1.316	1.308	1.498	1.489	0.599	0.421	2.80	3.18	1.48	1.69	14.8	12.1	74.5	101.9
1 x 1 1/8	1.498	1.489	1.690	1.680	0.676	0.456	3.18	3.59	1.69	1.90	16.7	13.7	101.9	129.6
1 x 1 1/8 x 1 1/4	1.690	1.680	1.882	1.871	0.753	0.508	3.59	4.00	1.90	2.12	18.6	15.2	129.6	160.3
1 1/4 x 1 3/8	1.882	1.871	2.074	2.062	0.830	0.560	4.00	4.41	2.12	2.33	20.5	16.8	160.3	194.9
1 3/8 x 1 1/2	2.074	2.062	2.246	2.233	0.898	0.606	4.41	4.77	2.33	2.53	22.2	18.2	194.9	228.3
1 1/2 x 1 5/8	2.246	2.233	2.438	2.424	0.975	0.658	4.77	5.18	2.53	2.74	24.1	19.7	228.3	268.5
1 5/8 x 1 3/4	2.438	2.424	2.610	2.595	1.044	0.705	5.18	5.55	2.74	2.94	25.8	21.1	268.5	306.3
1 3/4 x 2	2.610	2.595	2.792	2.776	1.117	0.754	5.55	5.93	2.94	3.14	27.6	22.6	306.3	351.1
2 x 2 1/4	2.792	2.776	3.186	3.168	1.274	0.860	5.93	6.77	3.14	3.58	31.5	25.8	351.1	456.1

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