

SURFACE VEHICLE STANDARD

SAE J530

REV.
MAY94

Issued 1948-02
Revised 1994-05

Superseding J530 JUN93

Submitted for recognition as an American National Standard

AUTOMOTIVE PIPE FITTINGS

1. Scope—This SAE Standard includes complete general and dimensional specifications for those types of pipe fittings commonly used in the automotive and other mass production industries where the use of lubricants or sealers is objectionable. The automotive pipe fittings shown in Figures 1 to 17 and Tables 1 to 6 are intended for general automotive and similar applications involving low or medium pressures or in conjunction with automotive tube fittings in piping systems.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J476—Dryseal Pipe Threads

SAE J846—Coding Systems for Identification of Fluid Conductors and Connectors

SAE J1615—Thread Sealants

2.1.2 ASTM PUBLICATION—Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 117—Method of Salt Spray (Fog) Testing

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

AUTOMOTIVE PIPE FITTINGS

NOTES: UNSPECIFIED DETAIL WITH RESPECT TO DIMENSIONS, TOLERANCES, CONTOURS, MATERIAL, WORKMANSHIP, ETC., MUST CONFORM TO GENERAL SPECIFICATIONS FOR AUTOMOTIVE PIPE FITTINGS. CODES SHOWN IN BRACKETS ADJACENT TO FIGURE NUMBERS REPRESENT RESPECTIVE FITTING IDENTIFICATION IN ACCORDANCE WITH SAE J846 (FEBRUARY, 1979).

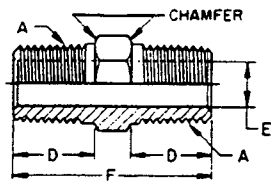


FIGURE 1—HEXAGON NIPPLE
(130137)

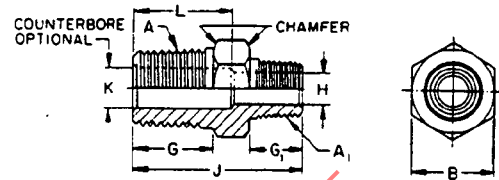


FIGURE 2—HEXAGON REDUCER NIPPLE
(130137)

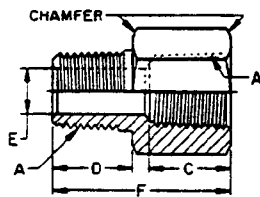


FIGURE 3—ADAPTER
(130139)

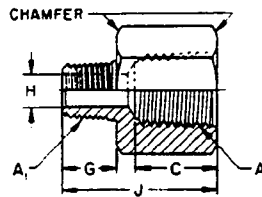


FIGURE 4—REDUCER
ADAPTER (130139)

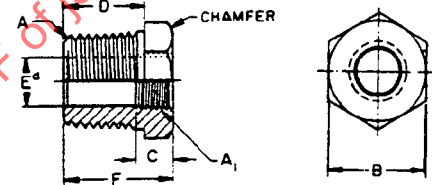


FIGURE 5—REDUCER
BUSHING (130140)

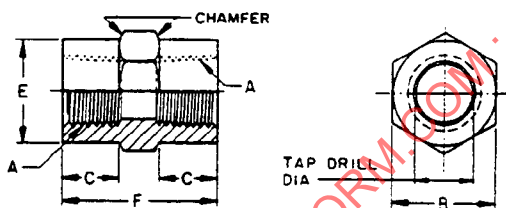


FIGURE 6—COUPLING (130138)

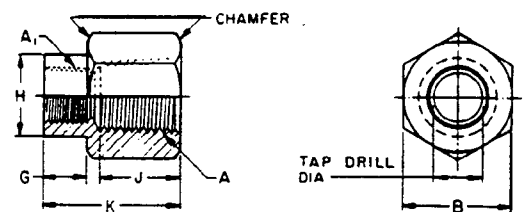


FIGURE 7—REDUCER COUPLING
(130138)

TABLE 1—DIMENSIONS OF HEXAGON NIPPLES AND REDUCER NIPPLES (FIGURES 1 AND 2)

Dryseal Taper Thread NPTFA In A	Hexagon Reducer Nipples In	All Nipples B		All Nipples B		All Nipples B		Nipples D Shoulder Length ^b mm	Nipples D Shoulder Length ^b In	Nipples E Drill Dia mm	Nipples E Drill Dia In	Nipples F Overall Length ^b mm	Nipples F Overall Length ^b In
		Hexagon Width Max mm	Hexagon Width Min mm	Hexagon Width Max In	Hexagon Width Min In	Hexagon Width Max mm	Hexagon Width Min mm						
1/16-27	—	8.03	7.87	0.316	0.310	9.7	9.7	0.38	0.141	3.58	0.141	23.9	0.94
1/8-27	1/8 x 1/16	11.18	11.02	0.440	0.434	9.7	9.7	0.38	0.219	5.56	0.219	24.6	0.97
1/4-18	1/4 x 1/8	14.38	14.17	0.566	0.558	14.2	14.2	0.56	0.312	7.92	0.312	35.1	1.38
3/8-18	3/8 x 1/8	17.58	17.37	0.692	0.684	14.2	14.2	0.56	0.438	11.13	0.438	35.8	1.41
1/2-14	1/2 x 3/8	22.33	22.12	0.879	0.871	19.0	19.0	0.75	0.562	14.27	0.562	46.0	1.81

TABLE 1—DIMENSIONS OF HEXAGON NIPPLES AND REDUCER NIPPLES (Figures 1 and 2) (Continued)

Dryseal Taper Thread NPTFA In A x A ₁	Hexagon Reducer Nipples In	Reducer Nipples G		Reducer Nipples G ₁		Reducer Nipples H		Reducer Nipples J		Reducer Nipples K		Reducer Nipples L	
		Shoulder Length ^b Min mm	Shoulder Length ^b Max mm	Shoulder Length ^b Min In	Shoulder Length ^b Max In	Drill Dia ^c mm	Drill Dia ^c In	Overall Length ^b mm	Overall Length ^b In	Max Dia ^c mm	Max Dia ^c In	Max Depth ^{b,c} mm	Max Depth ^{b,c} In
1/8 x 1/16	9.7	0.38	9.7	0.38	9.7	3.58	1.141	24.6	0.97	5.66	0.223	11.9	0.47
1/4 x 1/8	14.2	0.56	9.7	0.38	9.7	5.56	0.219	30.2	1.19	8.08	0.310	17.5	0.69
3/8 x 1/8	14.2	0.56	9.7	0.38	9.7	5.56	0.219	31.0	1.22	11.28	0.444	17.5	0.69
3/8 x 1/4	14.2	0.56	14.2	0.56	14.2	7.92	0.312	35.8	1.41	11.28	0.444	17.5	0.69
1/2 x 3/8	19.0	0.75	14.2	0.56	14.2	11.13	0.438	41.1	1.62	14.43	0.568	23.1	0.91

a Dryseal American Standard Taper Pipe Thread. See General Specifications.

b Where SAE Short Pipe Thread is authorized by purchaser, dimensions D, F, G, G₁, J, and L are reduced in accordance with reduction of pipe thread length. See General Specifications.

c At manufacturers option, through passages may conform with the smaller diameter specified or be counterbored to the larger diameter for the depth specified.

TABLE 2—DIMENSIONS OF ADAPTERS AND REDUCER ADAPTERS (FIGURES 3 AND 4)

Dryseal Taper Thread NPTF ^a In A	Dryseal Taper Thread NPTF ^a In A x A ₁ Reducer Adapters	All Adapters B		All Adapters B		All Adapters C		All Adapters C		All Adapters D		All Adapters E	
		Hexagon Width Max mm	Hexagon Width Min mm	Hexagon Width Max mm	Hexagon Width Min mm	Tap Drill Depth ^{b,c} mm	Tap Drill Depth ^{b,c} mm	Tap Drill Depth ^{b,c} mm	Tap Drill Depth ^{b,c} mm	Shoulder Length ^b mm	Shoulder Length ^b mm	Dia Drill mm	Dia Drill mm
1/16-27	—	11.18	11.02	0.440	0.434	9.7	9.7	0.38	0.38	9.7	9.7	3.58	3.58
1/8-27	1/8 x 1/16	14.38	14.17	0.566	0.558	14.17	14.17	0.38	0.38	9.7	9.7	5.56	5.56
1/4-18	1/4 x 1/8	19.15	18.95	0.754	0.746	14.2	14.2	0.56	0.56	14.2	14.2	7.92	7.92
3/8-18	3/8 x 1/4	22.33	22.12	0.879	0.871	14.2	14.2	0.56	0.56	14.2	14.2	11.13	11.13
1/2-14	1/2 x 3/8	27.13	26.87	1.068	1.058	19.0	19.0	0.75	0.75	19.0	19.0	14.27	14.27
3/4-14	3/4 x 1/2	35.05	34.80	1.380	1.370	19.0	19.0	0.75	0.75	19.0	19.0	19.05	19.05
1-11-1/2	1 x 3/4	41.40	41.15	1.630	1.620	23.9	23.9	0.94	0.94	23.9	23.9	23.82	23.82

TABLE 2—DIMENSIONS OF ADAPTERS AND REDUCER ADAPTERS (FIGURES 3 AND 4) (CONTINUED)

Dryseal Taper Thread NPTF ^a In A	Dryseal Taper Thread NPTF ^a In A x A ₁ Reducer Adapters	All Adapters F		All Adapters F		All Adapters G		All Adapters G		All Adapters H		All Adapters H		All Adapters J	
		Overall Length ^b mm	Overall Length ^b mm	Overall Length ^b mm	Overall Length ^b mm	Shoulder Length ^b mm	Shoulder Length ^b mm	Shoulder Length ^b mm	Shoulder Length ^b mm	Dia Drill mm	Dia Drill mm	Dia Drill mm	Dia Drill mm	Overall Length ^b mm	Overall Length ^b mm
1/16-27	—	21.3	0.84	21.3	0.84	0.38	0.38	0.38	0.38	0.141	0.141	0.141	0.141	21.3	0.84
1/8-27	1/8 x 1/16	22.4	0.88	22.4	0.88	0.38	0.38	0.38	0.38	0.141	0.141	0.141	0.141	26.9	1.06
1/4-18	1/4 x 1/8	31.8	1.25	31.8	1.25	0.56	0.56	0.56	0.56	0.312	0.312	0.312	0.312	31.8	1.25
3/8-18	3/8 x 1/4	31.8	1.25	31.8	1.25	0.56	0.56	0.56	0.56	0.312	0.312	0.312	0.312	31.8	1.25
1/2-14	1/2 x 3/8	42.2	1.66	42.2	1.66	0.75	0.75	0.75	0.75	0.438	0.438	0.438	0.438	37.3	1.47
3/4-14	3/4 x 1/2	42.9	1.69	42.9	1.69	0.75	0.75	0.75	0.75	0.438	0.438	0.438	0.438	42.9	1.69
1-11-1/2	1 x 3/4	52.3	2.06	52.3	2.06	0.75	0.75	0.75	0.75	0.438	0.438	0.438	0.438	47.8	1.88

^a Dryseal American Standard Taper Pipe Thread. See General Specifications.

^b Where SAE Short Pipe Thread is authorized by purchaser, dimensions C, F, G, and J are reduced in accordance with reduction of pipe thread length. See General Specifications.

^c Tap drill depths given require use of bottoming taps to produce standard full thread lengths. See General Specifications.

AUTOMOTIVE PIPE FITTINGS—CAST TYPE

NOTES: UNSPECIFIED DETAIL WITH RESPECT TO DIMENSIONS, TOLERANCES, CONTOURS, MATERIAL, WORKMANSHIP, ETC., MUST CONFORM TO GENERAL SPECIFICATIONS FOR AUTOMOTIVE PIPE FITTINGS. THE DIMENSIONAL DESIGNATIONS ON THE FIRST FIGURE IN EACH GROUP SHALL APPLY TO ALL OTHER FIGURES IN THAT GROUP EXCEPT AS SHOWN OTHERWISE. CODES SHOWN IN BRACKETS ADJACENT TO FIGURE NUMBERS REPRESENT RESPECTIVE FITTING IDENTIFICATION IN ACCORDANCE WITH SAE J846 (FEBRUARY, 1979).

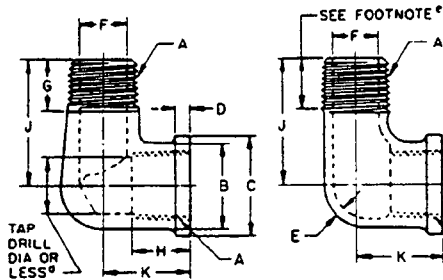


FIGURE 8—90 DEGREE STREET ELBOWS (130239)

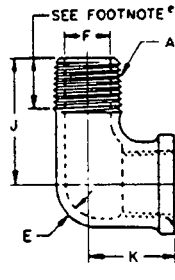


FIGURE 9—45 DEGREE STREET ELBOWS (130339)

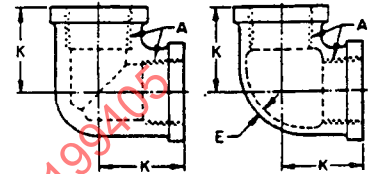
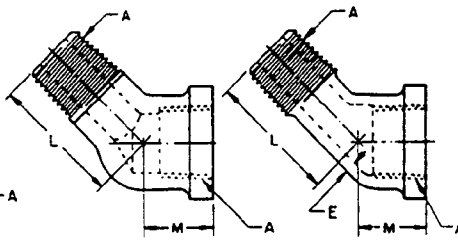


FIGURE 10—90 DEGREE PIPE ELBOWS (130238)

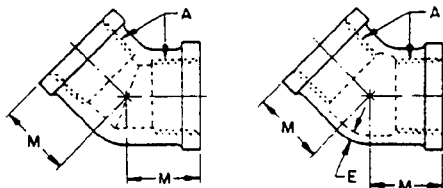


FIGURE 11—45 DEGREE PIPE ELBOWS (130338)

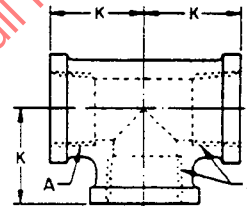


FIGURE 12A—INTERNAL, INTERNAL, INTERNAL TEES (130438)

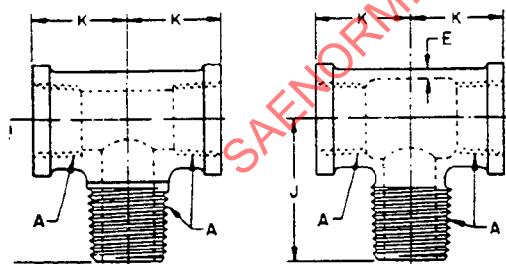
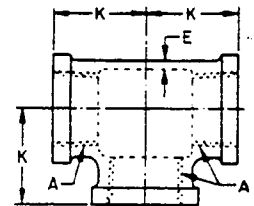


FIGURE 12B—INTERNAL, INTERNAL, EXTERNAL TEES (130425)

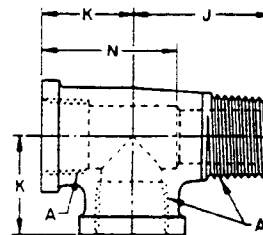


FIGURE 12C—INTERNAL, EXTERNAL, INTERNAL TEES (130424)

TABLE 3—DIMENSIONS OF REDUCER BUSHINGS (FIGURE 5)

Dryseal Taper Thread NPT ^a In	B		B		B		C		C		D		E		F	
	Hexagon Width Max	In	Hexagon Width Min	In	Hexagon Width Min	In	Tap Drill Depth ^{b,c} Min	mm	Tap Drill Depth ^{b,c} Min	mm	Shoulder Length ^b Min	mm	Hole Diam Min	mm	Overall Length ^b mm	Overall Length ^b In
1/8 x 1/16	11.18	0.440	11.02	0.434	9.7	0.38	9.7	0.38	9.7	0.38	0.38	3.53	0.139	14.2	0.56	0.75
1/4 x 1/8	14.38	0.566	14.17	0.558	9.7	0.38	14.2	0.38	14.2	0.38	0.56	5.51	0.217	19.0	0.75	0.75
3/8 x 1/8	17.58	0.692	17.37	0.684	9.7	0.38	14.2	0.38	14.2	0.38	0.56	5.51	0.217	19.0	0.75	0.75
3/8 x 1/4	19.15	0.754	18.95	0.746	14.2	0.56	14.2	0.56	14.2	0.56	0.56	7.85	0.309	19.0	0.75	0.75
1/2 x 1/8	22.33	0.879	22.12	0.871	9.6	0.38	14.2	0.38	14.2	0.38	0.75	5.51	0.217	25.4	1.00	1.00
1/2 x 1/4	22.33	0.879	22.12	0.871	14.2	0.56	14.2	0.56	14.2	0.56	0.75	7.85	0.309	25.4	1.00	1.00
1/2 x 3/8	22.33	0.879	22.12	0.871	14.2	0.56	14.2	0.56	14.2	0.56	0.75	11.05	0.435	25.4	1.00	1.00
3/4 x 1/4	28.70	1.130	28.45	1.120	14.2	0.56	14.2	0.56	14.2	0.56	0.75	7.85	0.309	25.4	1.00	1.00
3/4 x 3/8	28.70	1.130	28.45	1.120	14.2	0.56	14.2	0.56	14.2	0.56	0.75	11.05	0.435	25.4	1.00	1.00
3/4 x 1/2	28.70	1.130	28.45	1.120	19.0	0.75	19.0	0.75	19.0	0.75	0.94	14.20	0.559	25.4	1.00	1.00
1 x 1/2	36.63	1.442	36.37	1.432	19.0	0.75	19.0	0.75	19.0	0.75	0.94	18.98	0.747	33.3	1.31	1.31
1 x 3/4	36.63	1.442	36.37	1.432	19.0	0.75	19.0	0.75	19.0	0.75	0.94	18.98	0.747	33.3	1.31	1.31

^a Dryseal American Standard Pipe Thread. See General Specifications.

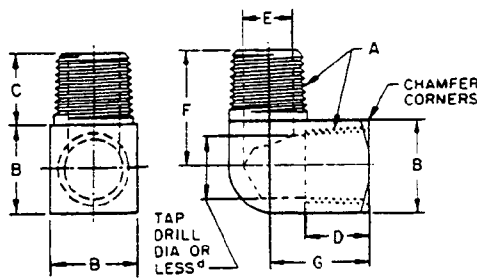
^b Where SAE Short Pipe Thread is authorized by purchaser, dimensions C, D, and F are reduced in accordance with reduction of pipe thread length. See General Specifications.

^c Tap drill depths given require use of bottoming taps to produce standard full thread lengths. See General Specifications.

^d At manufacturer's option, hole may conform to tap drill diameter or may be reduced beyond tap drill depth C, but in no case shall it be smaller than E diameter specified.

AUTOMOTIVE PIPE FITTINGS—EXTRUDED OR BAR STOCK TYPE

NOTES: UNSPECIFIED DETAIL WITH RESPECT TO DIMENSIONS, TOLERANCES, CONTOURS, MATERIAL, WORKMANSHIP, ETC., MUST CONFORM TO GENERAL SPECIFICATIONS FOR AUTOMOTIVE PIPE FITTINGS. THE DIMENSIONAL DESIGNATIONS ON THE FIRST FIGURE IN EACH GROUP SHALL APPLY TO ALL OTHER FIGURES IN THAT GROUP EXCEPT AS SHOWN OTHERWISE. CODES SHOWN IN BRACKETS ADJACENT TO FIGURE NUMBERS REPRESENT RESPECTIVE FITTING IDENTIFICATION IN ACCORDANCE WITH SAE J846 (FEBRUARY, 1979).



EMSFigure 13—90 DEGREE
EMStreet Elbow (130239)

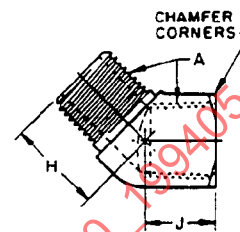
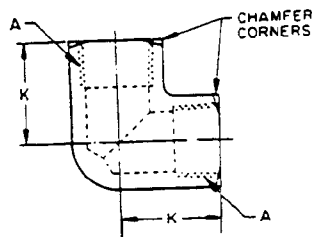


Figure 14—45 DEGREE
Street Elbow (130339)



EMSFigure 15—90 DEGREE
EMPipe Elbow (130238)

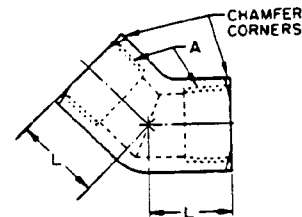


Figure 16—45 DEGREE,
Pipe Elbow (130338)

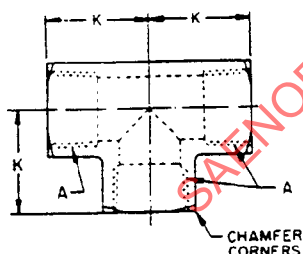


Figure 17A—INTERNAL,
INTERNAL, INTERNAL
(130438)

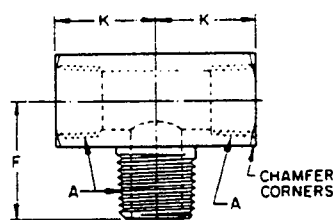


Figure 17B—INTERNAL,
INTERNAL, EXTERNAL
(130425)

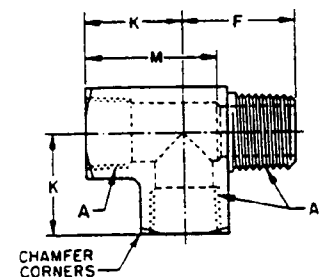


Figure 17C—INTERNAL,
EXTERNAL, INTERNAL
(130424)

FIGURE 17—TEES

(R) TABLE 4—DIMENSIONS OF COUPLINGS AND REDUCER COUPLINGS (FIGURES 6 AND 7)

Dryseal Taper Thread NPTF ^a , In A	Coupling	All Couplings B		All Couplings B		All Couplings B		Couplings C		Couplings E		Couplings F	
		Hexagon		Hexagon		Hexagon		Shoulder		Min Body		Overall	
		Width	Max	Width	Min	Width	Min	Length ^b	Shoulder	Dia	Min	Length ^b	Overall
Coupling		mm	In	mm	mm	In	In	mm	mm	mm	mm	mm	In
1/16-27	-----	11.18	0.440	11.02	0.434	7.1	0.28	11.2	0.44	19.0	0.75	19.0	0.75
1/8-27	1/8 x 1/16	14.38	0.566	14.17	0.558	6.9	0.27	14.2	0.56	19.0	0.75	19.0	0.75
1/4-18	1/4 x 1/8	19.15	0.754	18.95	0.746	11.2	0.44	19.0	0.75	28.4	1.12	28.4	1.12
3/8-18	3/8 x 1/8	22.33	0.879	22.12	0.871	10.7	0.42	22.4	0.88	28.4	1.12	28.4	1.12
—	3/8 x 1/4	22.33	0.879	22.12	0.871	—	—	—	—	—	—	—	—
1/2-14	1/2 x 1/8	27.13	1.068	26.87	1.058	15.0	0.59	26.9	1.06	38.1	1.50	38.1	1.50
—	1/2 x 1/4	27.13	1.068	26.87	1.058	—	—	—	—	—	—	—	—
—	1/2 x 3/8	27.13	1.068	26.87	1.058	—	—	—	—	—	—	—	—

(R) TABLE 4—DIMENSIONS OF COUPLINGS AND REDUCER COUPLINGS (Figures 6 and 7) (continued)

Dryseal Taper Thread NPTF ^a , In A	Dryseal Taper Thread NPTF ^a , In A x A ₁	Reducer Couplings G		Reducer Couplings H		Reducer Couplings J		Reducer Couplings K	
		Shoulder Length ^b mm	Shoulder Length ^b In	Min Body Dia mm	Min Body Dia In	Min Tap Depth ^{b,c} mm	Min Tap Depth ^{b,c} In	Overall Length ^b mm	Overall Length ^b In
1/16-27	—	7.9	0.31	12.7	0.50	9.7	0.38	19.8	0.78
1/8-27	1/8 x 1/16	7.9	0.31	14.2	0.56	14.2	0.56	24.6	0.97
1/4-18	1/4 x 1/8	6.4	0.25	14.2	0.56	14.2	0.56	23.9	0.94
3/8-18	3/8 x 1/8	11.9	0.47	19.0	0.75	14.2	0.56	29.5	1.16
—	3/8 x 1/4	6.4	0.25	14.2	0.56	19.0	0.75	30.2	1.19
1/2-14	1/2 x 1/8	8.6	0.34	19.0	0.75	19.0	0.75	32.5	1.28
—	1/2 x 1/4	11.2	0.44	22.4	0.88	19.0	0.75	35.1	1.38
—	1/2 x 3/8	—	—	—	—	—	—	—	—

^a Dryseal American Standard Taper Pipe Thread. See General Specifications.

^b Where SAE Short Pipe Thread is authorized by purchaser, dimensions C, F, G, J, and K are reduced in accordance with reduction of pipe thread length. See General Specifications.

^c Tap drill depths given require use of bottoming taps to produce standard full thread length. See General Specifications.

TABLE 5—DIMENSIONS OF CAST TYPE STREET ELBOWS, PIPE ELBOWS, AND PIPE TEES
(Figures 8 to 12)

A Dryseal Taper Thread NPTF ^a In	B Min Body Dia mm	B Min Body Dia In	C Min Collar Dia mm	C Min Collar Dia In	D Min Collar Thick- ness mm	D Min Collar Thick- ness In	E Min Wall Thick- ness mm	E Min Wall Thick- ness In	F Drill Dia ^f mm	F Drill Dia ^f In	G Turned Length ^b Min mm	G Turned Length ^b Min In	H Min Tap Drill Depth ^{b,c} mm	H Min Tap Drill Depth ^{b,c} In	J Center to End ^b Max mm	J Center to End ^b Max In
1/16-27	11.2	0.44	13.5	0.53	3.0	0.12	2.0	0.08	3.58	0.141	9.7	0.38	9.7	0.38	21.3	0.84
1/8-27	14.2	0.56	17.0	0.67	3.6	0.14	2.0	0.08	5.56	0.219	9.7	0.38	9.7	0.38	24.1	0.95
1/4-18	19.3	0.72	20.6	0.81	4.1	0.16	2.0	0.08	7.92	0.312	14.2	0.56	14.2	0.56	29.2	1.15
3/8-18	22.4	0.88	25.4	1.00	4.3	0.17	2.3	0.09	11.13	0.438	14.2	0.56	14.2	0.56	33.0	1.30
1/2-14	26.2	1.03	29.7	1.17	4.8	0.19	2.3	0.09	14.27	0.562	19.0	0.75	19.0	0.75	39.6	1.56

TABLE 5—DIMENSIONS OF CAST TYPE STREET ELBOWS, PIPE ELBOWS, AND PIPE
TEES (Figures 8 to 12) (Continued)

A Dryseal Taper Thread NPTF ^a In	J Center to End ^b Min mm	J Center to End ^b Min In	K Center to End ^b Max mm	K Center to End ^b Max In	L Center to End ^b Max mm	L Center to End ^b Max In	L Center to End ^b Min mm	L Center to End ^b Min In	M Center to End ^b Max mm	M Center to End ^b Max In	N Drill Depth mm	N Drill Depth In
1/16-27	19.8	0.78	13.5	0.53	18.3	0.72	16.8	0.66	11.2	0.44	16.8	0.66
1/8-27	22.6	0.89	14.7	0.58	20.6	0.81	19.0	0.75	11.4	0.45	19.0	0.75
1/4-18	27.2	1.07	19.3	0.76	23.4	0.92	21.3	0.84	15.2	0.60	24.6	0.97
3/8-18	30.5	1.20	22.4	0.88	24.6	0.97	22.1	0.87	17.0	0.67	—	—
1/2-14	36.6	1.44	27.4	1.08	28.4	1.12	25.4	1.00	21.3	0.84	—	—

^a Dryseal American Standard Taper Pipe Thread. See General Specifications.

^b Where SAE Short Pipe Thread is authorized by purchaser, dimensions G, H, J, K, L, and M are reduced in accordance with reduction of pipe thread length. See General Specifications.

^c Tap drill depths given require use of bottoming taps to produce standard full thread length. See General Specifications.

^d Hole diameters may be reduced beyond tap drill depth H, but shall not be less than F specified for corresponding size. (See Figure 8.)

^e Minimum pipe thread length where body is relieved or undercut shall not be shorter than L₂ plus one turn (thread) full thread. Thread length may be reduced one pitch (thread) if thread is cut through into relief or undercut. See SAE J478 and Figure 8.

^f 1/16, 1/8, and 1/4 in size cast fittings are generally produced from solid castings and have drilled passage holes, 3/8 and 1/2 in size cast fittings are generally produced with cored passage holes and may have internal minimum full thread length of 9.1 and 10.9 mm (0.36 and 0.43 in), respectively.

TABLE 6—DIMENSIONS OF EXTRUDED AND FORGED TYPE STREET ELBOWS, PIPE ELBOWS, AND PIPE TEES (Figures 13 to 17)

A Dryseal Taper Thread NPTFa, In	B Body Size mm	B Body Size In	C		D		E		F		G	
			Turned Length ^b Min	Turned Length ^b In	Min Tap Drill Depth ^{b,c} mm	Min Tap Drill Depth ^{b,c} In	Drill Dial ^d mm	Drill Dial ^d In	Center to End ^b ±0.8 mm	Center to End ^b ±0.03 In	Center to End ^b ±0.8 mm	Center to End ^b ±0.03 In
1/16-27	11.11	7/16	9.7	0.38	9.7	0.38	3.58	0.141	5.0	0.59	11.4	0.45
1/8-27	14.29	9/16	9.7	0.38	9.7	0.38	5.56	0.219	16.8	0.66	12.2	0.48
1/4-18	17.46	1 1/16	14.2	0.56	14.2	0.56	7.92	0.312	23.1	0.91	18.3	0.72
3/8-18	20.64	13/16	14.2	0.56	14.2	0.56	11.13	0.438	24.6	0.97	19.8	0.78
1/2-14	25.40	1	19.0	0.75	19.0	0.75	14.27	0.562	31.8	1.25	26.2	1.03
3/4-14	31.75	1-1/4	19.0	0.75	19.0	0.75	19.05	0.750	35.1	1.38	28.4	1.12
1-11-1/2	38.10	1-1/2	23.9	0.94	23.9	0.94	23.82	0.938	42.9	1.69	35.8	1.41

TABLE 6—DIMENSIONS OF EXTRUDED AND FORGED TYPE STREET ELBOWS, PIPE ELBOWS, AND PIPE TEES (Figures 13 to 17) (Continued)

A Dryseal Taper Thread NPTFa, In	H Center to End ^b ±0.8 mm	H Center to End ^b ±0.03 In	J Center to End ^b ±0.8 mm	J Center to End ^b ±0.03 In	K Center to End ^b ±0.8 mm	K Center to End ^b ±0.03 In	L Center to End ^b ±0.8 mm	L Center to End ^b ±0.03 In	M Drill Depth mm	M Drill Depth In
1/16-27	11.9	0.47	9.7	0.38	12.7	0.50	11.2	0.44	16.8	0.66
1/8-27	12.7	0.50	9.7	0.38	14.0	0.55	11.4	0.45	19.0	0.75
1/4-18	18.3	0.72	14.2	0.56	19.8	0.78	16.8	0.66	26.2	1.03
3/8-18	19.8	0.78	14.2	0.56	21.3	0.84	17.5	0.69	29.7	1.17
1/2-14	25.4	1.00	19.0	0.75	27.7	1.09	23.1	0.91	37.6	1.48
3/4-14	26.9	1.06	19.0	0.75	29.5	1.16	23.9	0.94	42.2	1.66
1-11-1/2	34.0	1.34	23.9	0.94	38.6	1.52	30.2	1.19	53.8	2.12

a Dryseal American Standard Taper Pipe Thread. See General Specifications.

b Where SAE Short Pipe Thread is authorized by purchaser, dimensions C, D, F, G, H, J, K, and L are reduced in accordance with reduction of pipe thread length. See General Specifications.

c Tap drill depths given require use of bottoming taps to produce standard full thread length. See General Specifications.

d Hole diameter may be reduced beyond tap drill depth D but shall not be less than E specified for corresponding size. (See Figure 13.)

3. General Specifications

- 3.1 Dimensions and Tolerances**—Except for nominal sizes and thread specifications, dimensions and tolerances are given in both SI and U.S. customary units as designated. Tabulated dimensions shall apply to the finished fittings, plated or otherwise processed, as specified by the purchaser. Unless otherwise specified, maximum and minimum across flats dimensions shall be within the commercial tolerance of bar or extruded stock from which the fittings are produced. The minimum across corner dimensions of external hexagons shall be 1.092 times the nominal width across flats, but shall not result in a side flat width less than 0.43 times the nominal width across flats. The minimum across corner dimensions of external squares shall be 1.25 times the nominal width across flats, but shall not result in a side flat width less than 0.75 times the nominal width across flats. Unless otherwise specified, tolerance on hole diameters designated drill in the dimensional tables shall be as tabulated in Table 7.

TABLE 7—DRILL TOLERANCES

Drill Size Range mm	Drill Size Range in	Tolerance on Hole Diameter Plus mm	Tolerance on Hole Diameter Plus in	Tolerance on Hole Diameter Minus mm	Tolerance on Hole Diameter Minus in
0.343 thru 4.699	0.0135 thru 0.1850	0.08	0.003	0.05	0.002
4.762 thru 6.299	0.1875 thru 0.2480	0.10	0.004	0.05	0.002
6.350 thru 19.050	0.2500 thru 0.7500	0.15	0.006	0.08	0.003
19.25 thru 25.400	0.7579 thru 1.0000	0.18	0.007	0.10	0.004

Tolerance on all dimensions not otherwise limited, shall be ± 0.25 mm (± 0.010 in). Angular tolerance on axis of ends on elbows and tees shall be ± 2.50 degrees for sizes up to and including $3/8$ in, and ± 1.50 degrees for sizes larger than $3/8$ in.

- 3.2 Wall Thickness**—Unless otherwise designated, the wall thickness at any point on fittings shall not be less than the thickness established by the specified dimensions, tolerances, and eccentricities for inner and outer surfaces.
- 3.3 Contour**—Details of contour shall be optional with the manufacturer provided the tabulated dimensions are maintained and serviceability of the fittings is not impaired. Wrench flats on elbows and tees shall be optional. Where extruded or forged shapes are reduced to conserve material, the wall thickness, unless otherwise specified, shall not be less than the respective minimum values tabulated in Table 8.
- 3.4 Passages**—Where passages in straight fittings are machined from opposite ends, the offset at the meeting point shall not exceed 0.38 mm (0.015 in). The cross-sectional area at the junction of passages in angle fittings shall not be less than that of the smaller passage.
- 3.5 Pipe Threads**—The pipe threads, unless there is specific authorization to the contrary, shall conform with the Dryseal American Standard Taper Pipe Thread (NPTF). At purchaser's option, the pipe thread may be shortened in conformity with the SAE Short Dryseal Taper Pipe Thread (PTF-SAE Short). Specifications for pipe threads are given in detail in SAE J476 (June, 1961). The pipe fitting dimensions tabulated herein are based on length of the Dryseal American Standard Taper Pipe Thread (NPTF), it being the consensus of manufacturers and users that trouble-free assembly and pressure-tight joints without lubricant or sealer cannot be assured.