

REV.  
D

AS5971™

RATIONALE

1. REVISE FINISH NOTE 3 TO ALLOW ANODIZE RING OPTION FOR NO CODE AND "A" CODE PART NUMBERS AND CLARIFY THE INTENDED USAGE OF BLUE COLOR MARKING.
2. REVISE NOTE 13 AND 15 TO CLARIFY THE USAGE OF ANODIZE RINGS.
3. UPDATING STANDARD TO INCLUDE NEW CLASS "D" CODE TO DENOTE USE ON ALUMINUM TUBING. SEE NOTE 18 FOR DETAILS.

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 revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

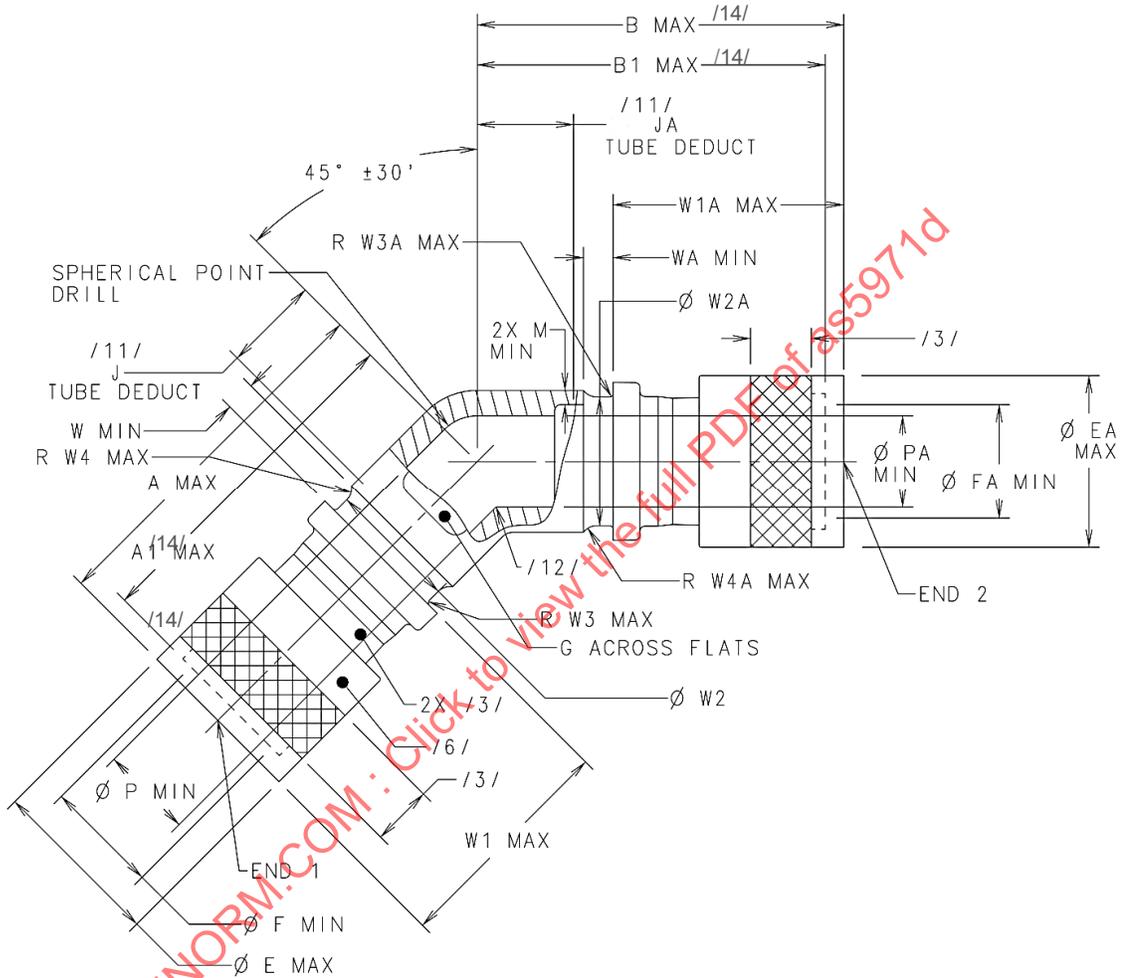
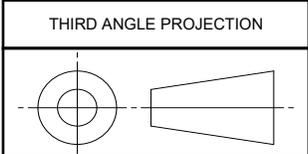


FIGURE 1 - ELBOW, 45°, AXIAL SWAGE

(SEE TABLES 1A, 1B, AND 1C FOR DIMENSIONAL INFORMATION)

For more information on this standard, visit  
<https://www.sae.org/standards/content/AS5971D/>



CUSTODIAN: G-3/G-3B		PROCUREMENT SPECIFICATION: AS5958 /4/	
	<b>AEROSPACE STANDARD</b>		<b>AS5971™</b> SHEET 1 OF 5
	FITTING ASSEMBLY, ELBOW, 45°, AXIALLY SWAGED, HYDRAULIC, 5080 PSI		

ISSUED 2006-01 REVISED 2020-06

**TABLE 1A - DIMENSIONS A THRU G**

BASIC NO. AS5971 /13/ SIZE CODE	NOMINAL TUBE SIZE END 1	NOMINAL TUBE SIZE END 2	A MAX	A1 MAX	B MAX	B1 MAX	E MAX	EA MAX	F MIN	FA MIN	G
0404	.2500	.2500	.934	.847	.934	.847	.466	.466	.253	.253	.380/ .348
0604	.3750	.2500	1.230	1.114	1.013	.926	.609	.466	.378	.253	.509/ .477
0606	.3750	.3750	1.230	1.114	1.230	1.114	.609	.609	.378	.378	.509/ .477
0806	.5000	.3750	1.477	1.331	1.269	1.153	.783	.609	.504	.378	.647/ .615
0808	.5000	.5000	1.477	1.331	1.477	1.331	.783	.783	.504	.504	.647/ .615
1008	.6250	.5000	1.850	1.646	1.556	1.410	.939	.783	.629	.504	.783/ .751
1010	.6250	.6250	1.850	1.646	1.850	1.646	.939	.939	.629	.629	.783/ .751
1210	.7500	.6250	2.080	1.875	1.929	1.725	1.122	.939	.754	.629	.925/ .893
1212	.7500	.7500	2.080	1.875	2.080	1.875	1.122	1.122	.754	.754	.925/ .893
1612	1.0000	.7500	2.496	2.282	2.198	1.993	1.495	1.122	1.004	.754	1.213/1.181
1616	1.0000	1.0000	2.496	2.282	2.496	2.282	1.495	1.495	1.004	1.004	1.213/1.181
2016	1.2500	1.0000	2.965	2.741	2.673	2.459	1.758	1.495	1.255	1.004	1.641/1.609
2020	1.2500	1.2500	2.965	2.741	2.965	2.741	1.758	1.758	1.255	1.255	1.641/1.609

**TABLE 1B - DIMENSIONS J THRU WA**

BASIC NO. AS5971 /13/ SIZE CODE	NOMINAL TUBE SIZE END 1	NOMINAL TUBE SIZE END 2	J /11/ TUBE DEDUCT	JA /11/ TUBE DEDUCT	M MIN	P MIN	PA MIN	W MIN	WA MIN
0404	.2500	.2500	.352 ±.150	.352 ±.150	.043	.198	.198	.123	.123
0604	.3750	.2500	.431 ±.150	.431 ±.150	.045	.302	.198	.153	.123
0606	.3750	.3750	.431 ±.150	.431 ±.150	.045	.302	.302	.153	.153
0806	.5000	.3750	.478 ±.175	.470 ±.150	.052	.401	.302	.165	.153
0808	.5000	.5000	.478 ±.175	.478 ±.175	.052	.401	.401	.165	.165
1008	.6250	.5000	.557 ±.175	.557 ±.175	.057	.507	.401	.140	.165
1010	.6250	.6250	.557 ±.175	.557 ±.175	.057	.507	.507	.140	.140
1210	.7500	.6250	.643 ±.175	.636 ±.175	.065	.604	.507	.154	.140
1212	.7500	.7500	.643 ±.175	.643 ±.175	.065	.604	.604	.154	.154
1612	1.0000	.7500	.768 ±.200	.761 ±.175	.084	.802	.604	.167	.154
1616	1.0000	1.0000	.768 ±.200	.768 ±.200	.084	.802	.802	.167	.167
2016	1.2500	1.0000	.954 ±.200	.945 ±.200	.174	1.011	.802	.185	.167
2020	1.2500	1.2500	.954 ±.200	.954 ±.200	.174	1.011	1.011	.185	.185

SAENORM.COM · Click to view the full PDF of as5971d

**TABLE 1C - DIMENSIONS W1 THRU W4A AND WEIGHTS**

BASIC NO. AS5971 /13/ SIZE CODE	NOMINAL TUBE SIZE END 1	NOMINAL TUBE SIZE END 2	W1 MAX	W1A MAX	W2 ±.0015	W2A ±.0015	W3 MAX	W3A MAX	W4 MAX	W4A MAX	WEIGHT LBS/EA APPROX REF
0404	.2500	.2500	.488	.488	.3005	.3005	.018	.018	.065	.065	.019
0604	.3750	.2500	.675	.488	.4475	.3005	.033	.018	.065	.065	.036
0606	.3750	.3750	.675	.675	.4475	.4475	.033	.033	.065	.065	.046
0806	.5000	.3750	.871	.675	.5945	.4475	.033	.033	.129	.065	.077
0808	.5000	.5000	.871	.871	.5945	.5945	.033	.033	.129	.129	.091
1008	.6250	.5000	1.190	.871	.7365	.5945	.021	.033	.078	.129	.130
1010	.6250	.6250	1.190	1.190	.7365	.7365	.021	.021	.078	.078	.148
1210	.7500	.6250	1.327	1.190	.8805	.7365	.024	.021	.089	.078	.212
1212	.7500	.7500	1.327	1.327	.8805	.8805	.024	.024	.089	.089	.238
1612	1.0000	.7500	1.612	1.327	1.1725	.8805	.027	.024	.099	.089	.415
1616	1.0000	1.0000	1.612	1.612	1.1725	1.1725	.027	.027	.099	.099	.513
2016	1.2500	1.0000	1.886	1.612	1.4345	1.1725	.030	.027	.113	.099	.811
2020	1.2500	1.2500	1.886	1.886	1.4345	1.4345	.030	.030	.113	.113	.835

NOTES:

1/ MATERIALS:

CODE LETTER "T"

RINGS - AMS4965 TITANIUM ALLOY, 6.0AI - 4.0V SOLUTION HEAT TREATED AND AGED OR AMS4928 TITANIUM ALLOY 6.0AI - 4.0V ANNEALED WITH HIGH STRENGTH CARBON FIBER/EPOXY RESIN COMPOSITE REINFORCEMENT.

BODY - AMS4928 TITANIUM ALLOY, 6.0AI - 4.0V ANNEALED

2. FINISH:

TITANIUM - NONE

3/ COATINGS/LUBRICANTS /15/:

a. NO SUFFIX CODE LETTER

- (1) RINGS - THE OUTER SURFACE SHALL HAVE A .125 INCH MINIMUM WIDTH BLUE BAND OR COMPLETELY COLORED BLUE PER AS5958. MARKING AND COLOR METHODS SHALL BE IN ACCORDANCE WITH AS5958. BLUE COLOR MARKING SHALL EXHIBIT CHEMICAL RESISTANCE PER AS5958. BLUE COLOR ON RING CORRESPONDS TO TOOLING COLOR SPECIFIED IN THE AS5959 INSTALLATION PROCEDURE AND DENOTES 5080 PSI CAPABILITY ON SWAGED END.
- (2) BODY - LEAD FREE SOLID FILM LUBRICANT PER AS5272 TYPE I OR II, OR PER AS6449 TYPE III OR IV, PTFE OR PETROLEUM-BASED LUBRICANT SHALL BE APPLIED TO PORTIONS OF THE ID AND OD. THE PETROLEUM-BASED LUBRICANT SHALL NOT BE IN CONTACT WITH THE SYSTEM FLUID.

b. SUFFIX CODE LETTER "A"

- (1) RINGS - NO BLUE PTFE COATING OR PAINT ALLOWED. BARE (NO FINISH) OR ANODIZED RINGS ARE ACCEPTABLE. THE WORD "BLUE" SHALL BE MARKED ON BARE RINGS ONLY. MARKING AND COLOR METHODS SHALL BE IN ACCORDANCE WITH AS5958. BLUE COLOR MARKING SHALL EXHIBIT CHEMICAL RESISTANCE PER AS5958. THE WORD "BLUE" AND BLUE COLOR ON RING CORRESPONDS TO TOOLING COLOR SPECIFIED IN THE AS5959 INSTALLATION PROCEDURE AND DENOTES 5080 PSI CAPABILITY ON SWAGED END.
- (2) BODY - LEAD FREE SOLID FILM LUBRICANT PER AS5272 TYPE I OR II, OR PER AS6449 TYPE III OR IV, PTFE OR PETROLEUM-BASED LUBRICANT SHALL BE APPLIED TO PORTIONS OF THE ID AND OD. THE PETROLEUM-BASED LUBRICANT SHALL NOT BE IN CONTACT WITH THE SYSTEM FLUID.

	<b>AEROSPACE STANDARD</b>	<b>AS5971™</b> SHEET 3 OF 5	<b>REV.</b> <b>D</b>
	FITTING ASSEMBLY, ELBOW, 45°, AXIALLY SWAGED, HYDRAULIC, 5080 PSI		

- c. SUFFIX CODE LETTER "B"
- (1) RINGS - PARTIALLY (.125 INCH MINIMUM WIDTH) OR COMPLETELY ANODIZED BLUE PER AS5958. MARKING AND COLOR METHODS SHALL BE IN ACCORDANCE WITH AS5958. BLUE COLOR MARKING SHALL EXHIBIT CHEMICAL RESISTANCE PER AS5958. BLUE COLOR ON RING CORRESPONDS TO TOOLING COLOR SPECIFIED IN THE AS5959 INSTALLATION PROCEDURE AND DENOTES 5080 PSI CAPABILITY ON SWAGED END.
  - (2) BODY - LEAD FREE SOLID FILM LUBRICANT PER AS5272 TYPE I OR II, OR PER AS6449 TYPE III OR IV, PTFE OR PETROLEUM-BASED LUBRICANT SHALL BE APPLIED TO PORTIONS OF THE ID AND OD. THE PETROLEUM-BASED LUBRICANT SHALL NOT BE IN CONTACT WITH THE SYSTEM FLUID.
- /4/ PROCUREMENT SPECIFICATION: AS5958 EXCEPT AS SPECIFIED ON THIS STANDARD. PRODUCT MANUFACTURED TO THIS STANDARD SHALL MEET THE REQUIREMENTS SPECIFIED HEREIN AND THE PROCUREMENT SPECIFICATION. ORIGINAL COMPONENT MANUFACTURERS (OCM) AND VALUE ADDED DISTRIBUTORS (VAD) SHALL BE LISTED IN THE PRI QUALIFIED PRODUCTS LIST (QPL) PRI-QPL-AS5958 FOR THIS STANDARD. SEE [www.eAuditNet.com](http://www.eAuditNet.com) FOR CURRENT QPL ONLINE.
5. DIMENSIONS AND TOLERANCES NOT DEFINED ON THIS STANDARD SHALL BE SPECIFIED AND CONTROLLED BY THE MANUFACTURER. THE MANUFACTURER IS RESPONSIBLE TO ENSURE COMPLIANCE WITH THE PROCUREMENT SPECIFICATION.
- /6/ IDENTIFICATION SHALL BE IN ACCORDANCE WITH AS5958 AND SHALL BE IDENTIFIED ON EITHER RING IN THE AREA SHOWN.
7. FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH AS5959. THE AFTER SWAGE ACCEPTABILITY LIMIT DIMENSION "Z" FOR EACH PORT SIZE IS DEFINED IN AS5959.
8. SURFACE TEXTURE: SYMBOLS PER ASME Y14.36M. REQUIREMENTS PER ASME B46.1. UNLESS OTHERWISE SPECIFIED, MACHINED SURFACES SHALL BE 125 MICROINCHES Ra AND FORGED SURFACES SHALL BE 250 MICROINCHES Ra.
9. DIMENSIONING AND TOLERANCING: ASME Y14.5M-1994.
- a. DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE SPECIFIED.
  - b. DIMENSIONAL TOLERANCES SHALL BE  $\pm .005$  INCH, UNLESS OTHERWISE SPECIFIED.
  - c. ANGULAR TOLERANCES SHALL BE  $\pm .50^\circ$ , UNLESS OTHERWISE SPECIFIED.
  - d. BREAK ALL EDGES .003 TO .010 INCH, UNLESS OTHERWISE SPECIFIED.
10. INTERPRETATION OF DRAWING PER AS4296.
- /11/ THIS DIMENSION IS THE ALLOWABLE TUBE END POSITIONING FOR SYSTEM LAYOUT DESIGN.
- /12/ .030 MIN RADIUS UNLESS QUALIFICATION OF SPECIAL PROCESS WITH SMALLER RADIUS.

SAENORM.COM: Click to view the full PDF of AS5971d

	<b>AEROSPACE STANDARD</b>	<b>AS5971™</b> SHEET 4 OF 5	<b>REV.</b> <b>D</b>
	FITTING ASSEMBLY, ELBOW, 45°, AXIALLY SWAGED, HYDRAULIC, 5080 PSI		