FEDERAL SUPPLY CLASS
4720

RATIONALE

ESTABLISH CUFF DIMENSIONAL REQUIREMENTS FOR INTEGRAL FIRE SLEEVE ON HOSE AND SLEEVE CODE H & J CONFIGURATIONS, FOR STANDARIZATION PURPOSES.

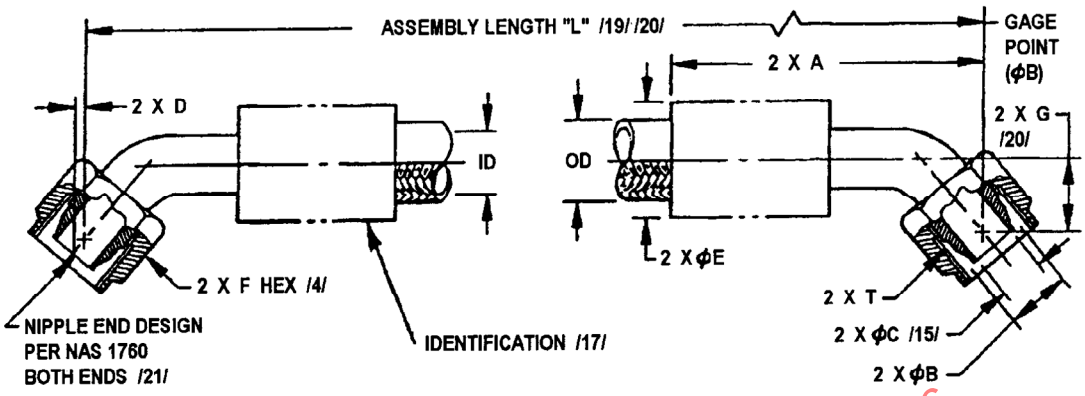


FIGURE 1 – HOSE ASSEMBLY

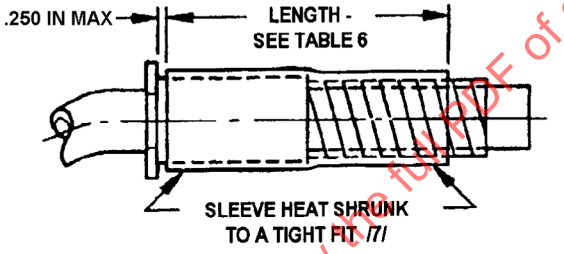


FIGURE 2 – ABRASION SLEEVE ATTACHMENT

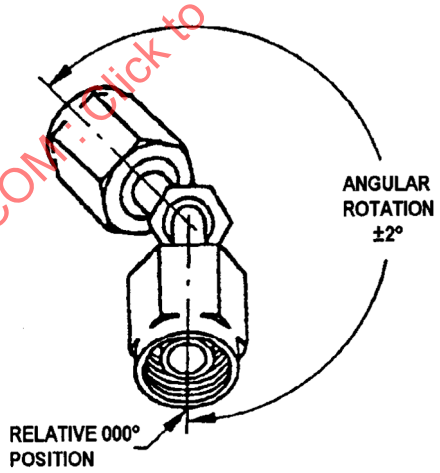
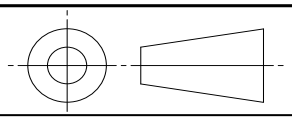


FIGURE 3 – FITTING ANGULAR POSITION /26/

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS650C

THIRD ANGLE PROJECTION



ISSUED 1992-06 REAFFIRMED 2007-07 REVISED 2011-06

CUSTODIAN: G-3/G-3D

PROCUREMENT SPECIFICATION: /14/ AS1946

SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

HOSE ASSEMBLY, POLYTETRAFLUOROETHYLENE, METAL BRAID, MEDIUM PRESSURE, FLARELESS, 45° TO 45°

SAE AS650

REV. C

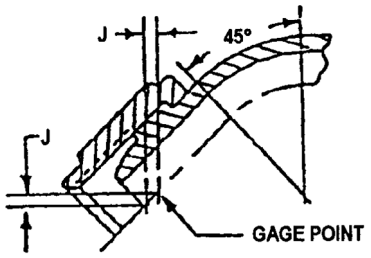


FIGURE 4 – GAGE POINT – SEE TABLE 7 /19/

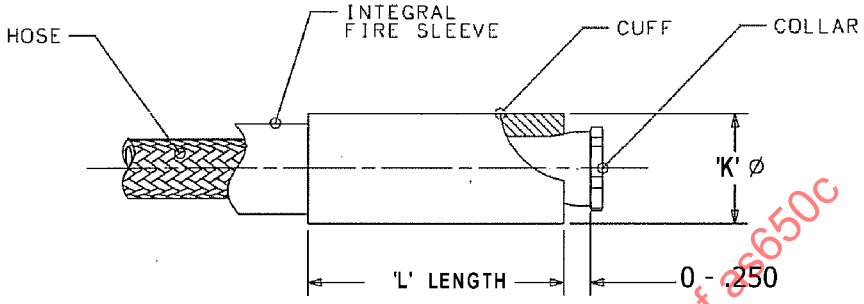


FIGURE 5 – SEE TABLE 8 /27/

TABLE 1 – DIMENSIONS

Hose Assembly No. & Size /24/	Hose Size (ref)	Fitting Matl /24/ /25/	Thread T per AS8879 (ref)	Hose ID Min (ref)	A Max	B Gage Basic	C Dia Min /15/	Min Ball Dia /15/	D (ref)	E Max Without Sleeving /16/	F Hex (ref)	G Min	G Max
AS650D (-03)	.188	CRES	.3750-24UNJF-3B	.110	1.660	.2340	.080	.068	.10	.49	.500	.336	.477
		AL	.3750-24UNJF-3B	.110	1.660	.2340	.080	.068	.10	.49	.500	.336	.477
		TI	.3750-24UNJF-3B	.110	1.660	.2340	.080	.068	.10	.49	.500	.336	.477
AS650E (-04)	.250	CRES	.4375-20UNJF-3B	.173	1.730	.2930	.132	.112	.11	.55	.562	.350	.485
		AL	.4375-20UNJF-3B	.173	1.730	.2930	.132	.112	.11	.55	.562	.350	.485
		TI	.4375-20UNJF-3B	.173	1.730	.2930	.132	.112	.11	.55	.562	.350	.485
AS650F (-05)	.312	CRES	.5000-20UNJF-3B	.235	1.910	.3500	.193	.164	.11	.63	.625	.368	.512
		AL	.5000-20UNJF-3B	.235	1.910	.3500	.193	.164	.11	.63	.625	.368	.512
		TI	.5000-20UNJF-3B	.235	1.910	.3500	.193	.164	.11	.63	.625	.368	.512
AS650G (-06)	.375	CRES	.5625-18UNJF-3B	.298	2.120	.4120	.256	.218	.12	.70	.688	.434	.589
		AL	.5625-18UNJF-3B	.298	2.120	.4120	.256	.218	.12	.70	.688	.434	.589
		TI	.5625-18UNJF-3B	.298	2.120	.4120	.256	.218	.12	.70	.688	.434	.589
AS650H (-08)	.500	CRES	.7500-16UNJF-3B	.391	2.380	.5600	.340	.289	.13	.83	.875	.497	.744
		AL	.7500-16UNJF-3B	.391	2.380	.5600	.340	.289	.13	.83	.875	.497	.744
		TI	.7500-16UNJF-3B	.391	2.380	.5600	.340	.289	.13	.83	.875	.497	.744
AS650J (-10)	.625	CRES	.8750-14UNJF-3B	.485	2.850	.6730	.430	.366	.14	.97	1.000	.576	.822
		AL	.8750-14UNJF-3B	.485	2.850	.6730	.430	.366	.14	.97	1.000	.576	.822
		TI	.8750-14UNJF-3B	.485	3.743	.6730	.430	.366	.14	.97	1.000	1.180	2.172
AS650K (-12)	.750	CRES	1.0625-12UNJ-3B	.615	3.120	.8100	.548	.466	.16	1.17	1.250	.582	.903
		AL	1.0625-12UNJ-3B	.615	3.120	.8100	.548	.466	.16	1.17	1.250	.582	.903
		TI	1.0625-12UNJ-3B	.615	4.270	.8100	.548	.466	.16	1.17	1.250	1.210	1.400
AS650M (-16)	1.000	CRES	1.3125-12UNJ-3B	.851	3.500	1.0620	.778	.661	.21	1.52	1.500	.648	.976
		AL	1.3125-12UNJ-3B	.851	3.500	1.0620	.778	.661	.21	1.52	1.500	.648	.976
		TI	1.3125-12UNJ-3B	.851	5.038	1.0620	.778	.661	.21	1.52	1.500	1.405	1.616
AS650N (-20)	1.250	CRES	1.6250-12UNJ-3B	1.101	4.070	1.3160	1.000	.850	.21	2.00	2.000	.799	1.132
		AL	1.6250-12UNJ-3B	1.101	4.325	1.3160	1.000	.850	.21	2.00	2.000	1.300	1.513
		TI	1.6250-12UNJ-3B	1.101	5.165	1.3160	1.000	.850	.21	2.00	2.000	1.650	1.861
AS650P (-24)	1.500	CRES	1.8750-12UNJ-3B	1.344	4.600	1.5650	1.250	1.063	.26	2.28	2.125	1.000	1.307
		AL	1.8750-12UNJ-3B	1.344	4.966	1.5650	1.250	1.063	.26	2.28	2.125	1.500	1.729
		TI	1.8750-12UNJ-3B	1.344	5.939	1.5650	1.250	1.063	.26	2.28	2.125	1.900	2.132

TABLE 2 – TOLERANCES

HOSE ASSEMBLY LENGTH	TOLERANCE
UNDER 18 IN	±.125
18 TO 36 IN EXCLUSIVE	±.250
36 TO 50 IN EXCLUSIVE	±.500
50 IN AND OVER	±1%

TABLE 3 – HOSE AND SLEEVE CODES

HOSE OR SLEEVE CODE	SLEEVE MATERIAL	TEMP. LIMIT °F
-	(-) INDICATES HOSE ONLY, NO SLEEVE (AS639)	450
A	ABRASION SLEEVE TUBULAR (PTFE - AS1291 - CODE B) /6/	450
B	ABRASION SLEEVE COIL (NYLON AS1294) /7/	275
C	FIRE SLEEVE (AS1072 SIL-FG) (15 MIN) /8/ /9/ /13/	450
E	ABRASION SLEEVE SHRINK-ON (FEP) /11/	350
F	ABRASION SLEEVE SHRINK-ON (POLYOLEFIN AS1073 - CODE B) /11/	275
G	FIRE SLEEVE (AS1072 SIL-FG) (5 MIN) /8/ /9/ /12/	450
H	FIRE SLEEVE INTEGRAL SILICONE (AS1723) (15 MIN) /13/ /27/	450
J	FIRE SLEEVE INTEGRAL SILICONE (5 MIN) /12/ /27/	450
K	INTEGRAL ABRASION SLEEVE (BRAIDED) POLYESTER /10/	300
L	ABRASION SLEEVE COIL (PTFE - AS1293) /7/	450

TABLE 4 – HOSE AND SLEEVE OUTSIDE DIAMETERS

HOSE OR SLEEVE CODE	TOLERANCE	HOSE SIZE /5/ .188	HOSE SIZE /5/ .250	HOSE SIZE /5/ .313	HOSE SIZE /5/ .375	HOSE SIZE /5/ .500	HOSE SIZE /5/ .625	HOSE SIZE /5/ .750	HOSE SIZE /5/ 1.000	HOSE SIZE /5/ 1.250	HOSE SIZE /5/ 1.500
-	MAX	.285	.343	.406	.469	.585	.687	.812	1.140	1.390	1.707
	MIN	.234	.304	.367	.430	.546	.641	.766	1.078	1.328	1.637
A	MAX	.390	.473	.524	.620	.715	.818	.955	1.295	1.550	1.841
	MIN	.320	.393	.454	.515	.645	.748	.870	1.210	1.450	1.771
B	MAX	.339	.409	.472	.535	.669	.767	.896	1.224	1.474	1.807
	MIN	.260	.330	.393	.456	.590	.681	.810	1.122	1.372	1.681
C	MAX	.692	.692	.780	.840	.970	1.090	1.220	1.590	1.900	2.190
	MIN	.533	.533	.598	.658	.778	.908	1.038	1.288	1.658	1.898
E	MAX	.301	.375	.438	.507	.635	.749	.887	1.288	1.440	1.761
	MIN	.248	.320	.383	.452	.578	.679	.811	1.146	1.358	1.667
F	MAX	.341	.411	.474	.547	.663	.769	.904	1.244	1.482	1.823
	MIN	.278	.348	.411	.484	.600	.699	.834	1.158	1.396	1.729
G	MAX	.692	.692	.780	.840	.970	1.090	1.220	1.590	1.900	2.190
	MIN	.533	.533	.598	.658	.778	.908	1.038	1.288	1.658	1.898
H	MAX	.641	.641	.704	.766	.891	1.016	1.141	1.454	1.704	2.016
	MIN	.537	.594	.657	.719	.844	.949	1.074	1.394	1.649	1.957
J	MAX	.641	.641	.704	.766	.891	1.016	1.141	1.454	1.704	2.016
	MIN	.537	.594	.657	.719	.844	.949	1.074	1.394	1.649	1.957
K	MAX	.378	.430	.499	.559	.665	.772	.887	1.210	1.460	1.782
	MIN	.320	.390	.450	.510	.625	.726	.841	1.148	1.398	1.712
L	MAX	.375	.445	.508	.571	.687	.789	.914	1.242	1.492	1.809
	MIN	.267	.333	.407	.470	.586	.681	.828	1.138	1.388	1.697

TABLE 5 – HOSE WEIGHT MAX. ALL OTHERS REF

HOSE OR SLEEVE CODE OR FITTING	UNITS	HOSE SIZE .188	HOSE SIZE .250	HOSE SIZE .313	HOSE SIZE .375	HOSE SIZE .500	HOSE SIZE .625	HOSE SIZE .750	HOSE SIZE 1.000	HOSE SIZE 1.250	HOSE SIZE 1.500
-	LB/IN	.005	.007	.008	.010	.012	.016	.020	.045	.058	.074
A	LB/IN	.003	.004	.004	.006	.007	.008	.010	.014	.020	.045
B	LB/IN	.001	.001	.002	.002	.003	.004	.004	.005	.006	.009
C	LB/IN	.009	.009	.011	.012	.017	.018	.028	.030	.040	.037
E	LB/IN	.001	.002	.002	.002	.003	.004	.006	.007	.007	.008
F	LB/IN	.002	.002	.002	.002	.003	.003	.005	.006	.006	.007
G	LB/IN	.009	.009	.011	.012	.017	.018	.028	.030	.040	.037
H	LB/IN	.016	.018	.020	.023	.030	.037	.045	.085	.107	.132
J	LB/IN	.016	.017	.018	.021	.027	.035	.042	.079	.100	.123
K	LB/IN	.006	.008	.009	.011	.015	.018	.023	.050	.063	.081
L	LB/IN	.003	.004	.004	.005	.008	.009	.011	.018	.022	.028
FIRESLEEVE CLAMP	LB/EA	.015	.016	.018	.019	.021	.023	.025	.029	.033	.037
FITTING END 45° /25/ A/D - CRES	LB/EA	.051	.065	.080	.112	.172	.266	.360	.590	1.110	1.540
B/E - ALUM	LB/EA	---	---	---	.055	.080	.110	.165	.275	.470	.640
C/F - TI	LB/EA	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

TABLE 6 – SLEEVE LENGTH

HOSE SIZE	LENGTH
.188, .250, .313, .375	2.00 ± .25
.500, .625	2.50 ± .25
.750, 1.000	3.00 ± .25
1.250, 1.500	4.00 ± .25

TABLE 7 – DIMENSION J (SEE FIGURE 3) /19/

SIZE CODE	J
3	.060
4	.044
5	.041
6	.042
8	.045
10	.055
12	.049
16	.093
20	.064
24	.095

TABLE 8 – INTEGRAL FIRE SLEEVE CUFF DIMENSIONS /27/

HOSE SIZE (REF)	'K' MAX	'L' MAX
.250	.90	1.61
.313	.97	1.70
.375	1.03	2.18
.500	1.15	2.50
.625	1.29	2.67
.750	1.41	2.67
1.00	1.71	3.10
1.25	2.04	2.80
1.50	2.37	2.95

NOTES:

1. CONSTRUCTION AND PERFORMANCE: AS1946, FITTINGS SHALL BE PERMANENTLY ATTACHED TO THE HOSE.
2. OPERATING CHARACTERISTICS: SEE AS1946.
3. MATERIALS:
   a. HOSE AND FITTINGS - PER AS1946 /25/
   b. SLEEVES - SEE APPLICABLE STANDARDS, TABLE 3

/4/ STANDARD COUPLING NUTS SHALL BE IN ACCORDANCE WITH AS21921, AS1790 OR AS4370 AND MATE WITH AS33514, AS4377 OR AS4375 FITTING ENDS. NONSTANDARD COUPLING NUTS MAY BE USED, PROVIDED THEY ARE FUNCTIONALLY EQUIVALENT, AND PROVIDED THEY CANNOT BE REMOVED FROM THE FITTING. NUTS SHALL MEET THE TORQUE TEST REQUIREMENTS PER AS1946.

/5/ DIAMETERS ARE LISTED FOR CLAMP SELECTION. TUBULAR SLEEVES MAY NOT BE A PERFECT ROUND AND SHALL BE MEASURED WITH A DIAMETER MEASUREMENT TAPE.

/6/ THE INSTALLED TUBULAR ABRASION SLEEVES AXIAL MOVEMENT ON THE HOSE SHALL NOT EXCEED .05 IN. ENDS OF THE TUBULAR SLEEVE SHALL BE TERMINATED WITH A LENGTH OF AMS-DTL-23053/11 (FEP) CLASS 1 OR 2, COLOR CLEAR, PER TABLE 6 AND FIGURE 2.

/7/ COIL ABRASION SLEEVES, WHEN ASSEMBLED ON A STRAIGHT HOSE, SHALL HAVE AN AVERAGE GAP BETWEEN COILS NOT EXCEEDING .05 in. DISPLACEMENT OF THE COILS OF THE SLEEVE, CAUSING A GREATER GAP, SHALL NOT BE CAUSE FOR REJECTION IF THE COILS CAN BE REPOSITIONED TO MEET THE GAP REQUIREMENTS. ENDS OF THE COIL SLEEVE SHALL BE TERMINATED WITH A LENGTH OF HEAT SHRINKABLE SLEEVING IN ACCORDANCE WITH TABLE 6 AND FIGURE 2. CODE "B" (NYLON COIL) ABRASION SLEEVES SHALL BE TERMINATED WITH AMS-DTL-23053/5 CLASS 1 OR 3, COLOR BLACK. CODE "L" (COIL ABRASION) SLEEVES SHALL BE TERMINATED WITH AMS-DTL-23053/12, CLASS 1, COLOR TRANSPARENT, PTFE. (OPTIONAL FOR BOTH SLEEVES AMS-DTL-23053/11 (FEP) CLASS 1 OR 2, COLOR CLEAR).

/8/ THE TABLE 4 SLEEVE DIAMETERS FOR AS1072 SLEEVES APPLY WHEN THE SLEEVE IS COMPRESSED, OR CLAMPED, TO CONTACT THE HOSE. IN THIS CASE, A WRINKLE MAY OCCUR OVER APPROXIMATELY 10% OF THE SLEEVE CIRCUMFERENCE.

/9/ THE CUT ENDS OF THE FIRE SLEEVE SHALL BE SEALED USING RTV SILICONE RUBBER, PRIOR TO INSTALLATION, TO PREVENT WICKING OF FLUIDS. THE FIRE SLEEVE ENDS SHALL BE SECURED TO THE HOSE ASSEMBLY END FITTINGS WITH CORROSION RESISTANT STEEL BANDS. AFTER INSTALLATION, CRACKS OR VOIDS IN THE FIRE SLEEVE, WHICH EXPOSE THE FIBERGLASS, SHALL BE COATED WITH SILICONE RUBBER.

/10/ INTEGRAL ABRASION SLEEVE SHALL FORM AN INTEGRAL, PERMANENT PART OF THE HOSE AND SHALL TERMINATE A MAXIMUM OF .250 FROM THE END OF THE COLLAR.

/11/ FEP AND POLYOLEFIN SHRINK ABRASION SLEEVES SHALL BE SHRUNK TO A SNUG FIT OVER THE HOSE AND END FITTING COLLARS. SLEEVE SHALL COVER A MINIMUM OF ONE HALF THE COLLAR.

/12/ ADD "AS1055 TYPE IIb CLASS A-S/P" OR "AS150 TYPE VIIbA" TO IDENTIFICATION MARKING TO SHOW LEVEL OF COMPLIANCE, "FIRE RESISTANT (5 min), WITH AS1055 OR AS150"

/13/ ADD "AS1055 TYPE IIb CLASS B-S/P" TO IDENTIFICATION MARKING TO SHOW LEVEL OF COMPLIANCE, "FIRE PROOF (15 min), WITH AS1055"

/14/ PRODUCT SUPPLIED TO THIS SPECIFICATION SHALL BE MANUFACTURED AND ASSEMBLED BY AN ACCREDITED MANUFACTURER OR ASSEMBLED BY AN ACCREDITED ASSEMBLING DISTRIBUTOR LISTED IN THE PERFORMANCE REVIEW INSTITUE (PRI) QUALIFIED PRODUCT LIST FOR PRI-QPL-AS1946 FOR THIS STANDARD. SEE http://www.eauditnet.com FOR CURRENT QPL ONLINE.

/15/ A TRUE CIRCULAR CROSS SECTION IS NOT REQUIRED THROUGH THE FITTING ID. HOWEVER, THE APPLICABLE MINIMUM BALL DIAMETER LISTED IN TABLE 1 MUST BE CAPABLE OF PASSING THROUGH THE HOSE ASSEMBLY.