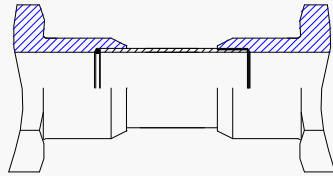


BRAZE PERMANENT FITTING



DESIGN CONCEPT:

Airdrome Precision Components, was a licensee of Douglas Aircraft Co. (prior to become Boeing Co.) for manufacturing Cres fittings commencing with DC-10 aircraft, was also the original manufacturer of Titanium Alloy Braze fittings starting with their MD-11 aircraft followed by the MD-80's and 90's. Braze fitting joints are known to be lightweight, high performance and extremely durable.

The braze cavity was designed to have a braze alloy ring pre-assembled on the inside of the fitting end for tube braze. When the fitting/tubing joint is clamped inside the tool to be brazed by induction heat coil. It will melt the braze alloy ring only and the material will flow evenly around to fill up the interface gap between fitting and tubing to form a permanent joint. The interface gap was designed to hold full filling of the melted braze alloy ring to assure full bounding for fluid sealing.

Any conventional induction heat coil set up can be used to braze these fittings. As an option for service, Boeing sub-contractors can also accomplish Brazing of fitting / tubing joints ready for tube installation.

While the superior performance of the Braze fittings offer the best of tube assembly connecting features, the separable fittings provide durability of permanent connections and offer the flexibility to interface with Boss, Flared, Flareless or DualISeal fitting ends providing an unrivaled fitting joint connection.

DESIGN ADVANTAGES:

- X Unified Brazed joints offers positive sealing.
- X Offers compact envelope, lightweight and durable service life.

STANDARD PROCUREMENT SPECIFICATIONS FOR BRAZE FITTINGS

SAE AS4459 and Military MIL-B-7883 specifications define Form, Fit, Function and Procurement requirements for Braze fittings.

QUALIFICATION AND APPROVAL STATUS

Airdrome fittings were qualified per Boeing S7928939 and 27D0002 specifications and are approved for use in various commercial programs at Boeing, Lockheed, etc.

FITTING AND BRAZE RING MATERIAL SELECTION

The Braze fittings and Braze Rings are offered in the following materials for use with various tubing materials, fluid and operating temperature:

FITTING MATERIAL AND CODING

Titanium Alloy	Code T	Indicates 6AL-4V per AMS4928.
Cres	Code JL	Indicates 304L per QQ-S-763.

BRAZE RING MATERIAL AND CODING

Gapasil	Code G	Indicates Gapasil # 9.
Silver	Code S	Indicates class BAg - 19 silver wire per AWS A5.8 - 69.
	Code V	Indicates class BAg - 8a silver wire per AWS A5.8 - 62T
Gold	Code W	Indicates class BAu - 4 gold wire per AWS A5.8 - 62T or ASTM B260 - 62T.

COMPATIBILITY OF FITTING, BRAZE RING AND TUBING MATERIALS

(Fitting Code)	(Braze Ring Code)	(Tubing Material)
T	G	Titanium Alloy 3AL-2.5V per AMS4944 or similar.
JL	S or W	Cres 21-6-9 per AMS5661 or similar.
JL	V	Cres 304L per MIL-T-8504, 304 1/8 Hard per MIL-T-6845, 321 per MIL-T-8808 or similar.

SIZE AND MATERIAL VERSUS OPERATING PRESSURE

Fitting/tubing operating pressures vary according to size and material. The following shows standard size range and corresponding operating pressures:

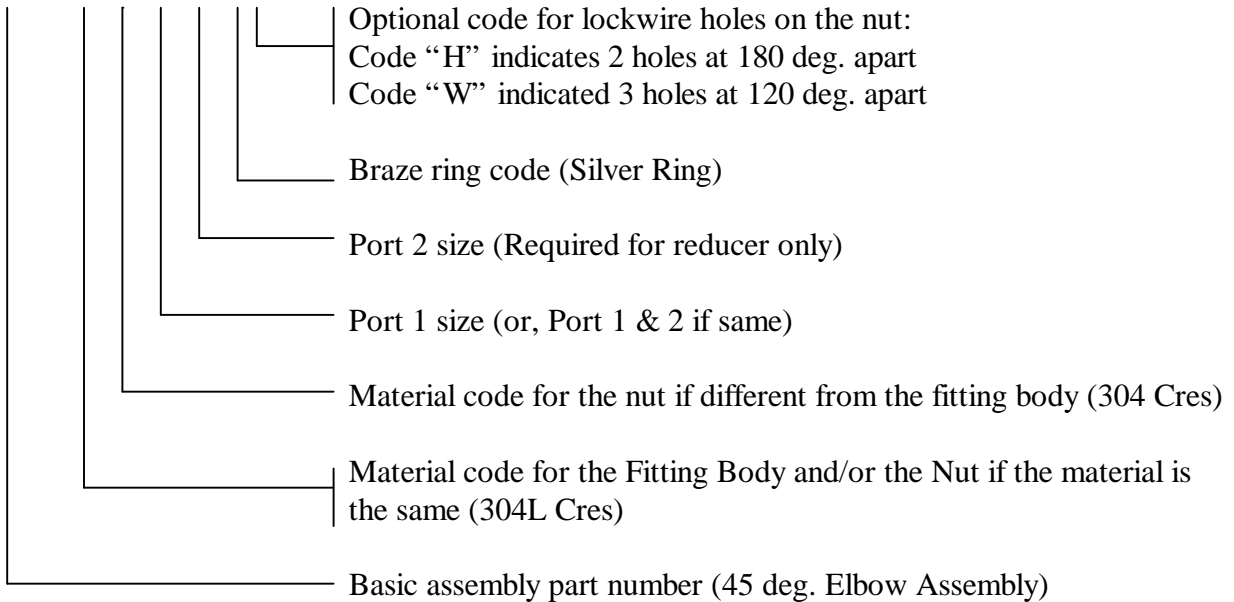
FITTING SIZE	TUBE O.D.	OPERATING PRESSURE (psi) PER FITTING MATERIAL Ti Alloy and Cres
03	3/16	3000
04	1/4	3000
05	5/16	3000
06	3/8	3000
08	1/2	3000
10	5/8	3000
12	3/4	3000
16	1	3000
20	1-1/4	3000

TOOLING





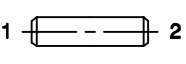
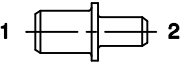
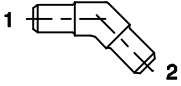
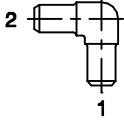
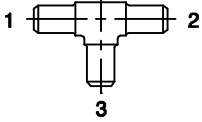
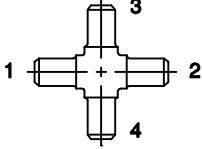
Tube fabrication sub-contractors of Boeing are equipped to braze fittings. Commercially available induction coil tooling can also be used as option.

EXAMPLE OF PART NUMBER FOR ORDERING FITTINGS

AP2134 JL J 12 08 S H







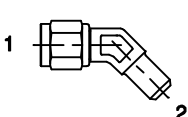
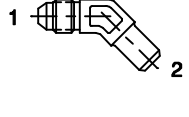
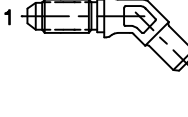
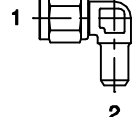
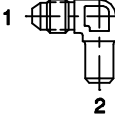
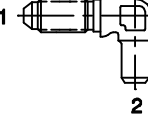
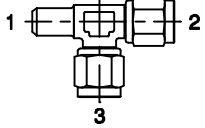
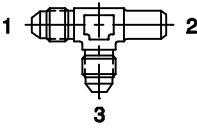
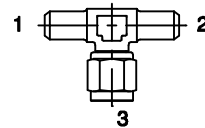
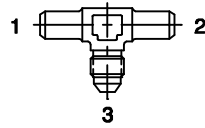
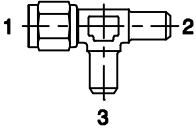
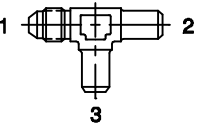
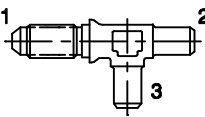
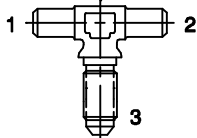
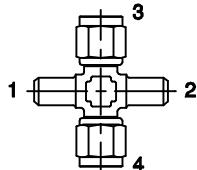
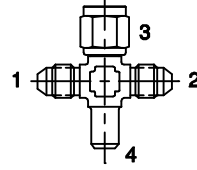
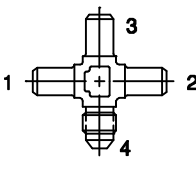


Note: Contact Airdrome Precision Components for special fitting configuration, material and/or size not listed in this catalog.

					
AP2102	AP2103	AP2647	AP2186	AP2118	AP2119
					
AP9329	AP2120	AP2112/AP2113	AP2125/AP2126		

Tube Braze Fittings					
Fitting Shape	Port Sequence for Airdrome Part No. (See Example of Part No.)				Airdrome Standard
	1	2	3	4	
	Gold Braze Ring				
Silver Braze Ring					AP 2103
Silver Braze Ring					AP 2647
Gapisal Braze Ring					AP 2186
Straight	b	b			AP 2118
					*AP 2119
45 deg. Elbow	b	b			AP 9329
90 deg. Elbow	b	b			AP 2120
Tee	b	b	b		AP 2112
					*AP 2113
Cross	b	b	b	b	AP 2125
					*AP 2126


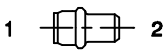
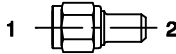
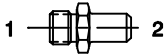
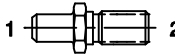
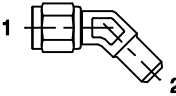
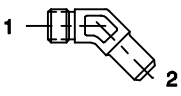
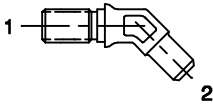
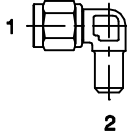
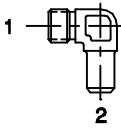
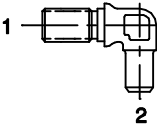
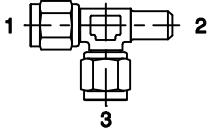
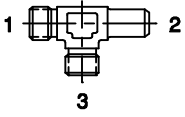
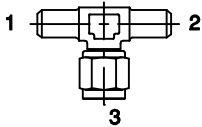
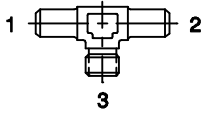
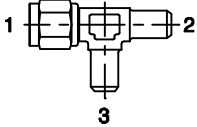
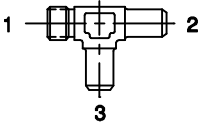
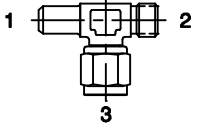
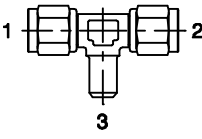
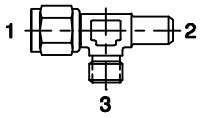
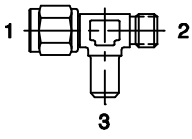
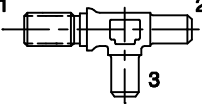
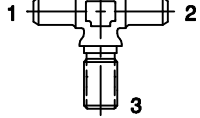
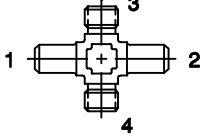
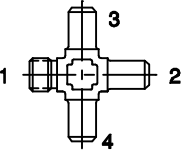
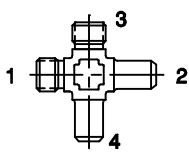
Notes: 1. b = Tube Braze port.
2. * = A different part number assigned for reducers.

					
AP2109	AP2108/AP2165	AP2142	AP2115/2150	AP2111/AP2117	AP2197
					
AP2134	AP9326	AP2124	AP2136	AP9330	AP2122/AP2162
					
AP2174/AP2674	AP2191	AP2140	AP2160/AP2190	AP2138	AP2632/AP2698
					
AP2128	AP2130/AP2159	AP2608	AP2175	AP9775	

Adapters for Tube Braze to 37 deg. Flared Fittings

Fitting Shape	Port Sequence for Airdrome Part No. (See Example of Part No.)				Airdrome Standard
	1	2	3	4	
Coupling Nut Sleeve					AP2109
	F	b			AP2108 *AP2165
Straight	F	b			AP2142
	M	b			AP2115 *AP2150
	B	b			AP2111 *AP2117
	B	b			AP2197
45 deg. Elbow	F	b			AP2134
	M	b			AP9326
	B	b			AP2124
90 deg. Elbow	F	b			AP2136
	M	b			AP9330
	B	b			AP2122 *AP2162
Tee	b	F	F		AP2174 *AP2674
	M	b	M		AP2191
	b	b	F		AP2140
	b	b	M		AP2160 *AP2190
	F	b	b		AP2138
	M	b	b		AP2632 *AP2698
	B	b	b		AP2128
	b	b	B		AP2130 *AP2159
Cross	b	b	F	F	AP2608
	M	M	F	b	AP2175
	b	b	b	M	AP9775

- Notes: 1. F = Female 37 deg. Flared port,
M = Male 37 deg. Flared port,
B = Bulkhead 37 deg. Flared male port,
b = Tube Braze port.
2. * = A different part number assigned for reducers.

 AP2109	 AP2107/AP2167	 AP2141	 AP2114/AP2184	 AP2110/AP2116	 AP2133
 AP2194	 AP2123/AP2177	 AP2135	 AP9325	 AP2121/AP2151	 AP2158
 AP2147/AP2199	 AP2139/AP2161	 AP2164/AP2198	 AP2137/AP2148	 AP9553	 AP2513
 AP2189	 AP9551	 AP9552	 AP2127/AP2146	 AP2129/AP2152	 AP9000
 AP9776	 AP9778				

Adapters for Tube Braze to 24 deg. Flareless Fittings

Fitting Shape	Port Sequence for Airdrome Part No. (See Example of Part no.)				Airdrome Standard
	1	2	3	4	
Coupling Nut Sleeve					AP2109
	F	b			AP2107 *AP2167
Straight	F	b			AP2141
	M	b			AP2114 *AP2184
	B	b			AP2110 *AP2116
45 deg. Elbow	F	b			AP2133
	M	b			AP2194
	B	b			AP2123 *AP2177
90 deg. Elbow	F	b			AP2135
	M	b			AP9325
	B	b			AP2121 *AP2151
Tee	F	b	F		AP2158
	M	b	M		AP2147 *AP2199
	b	b	F		AP2139 *AP2161
	b	b	M		AP2164 *AP2198
	F	b	b		AP2137 *AP2148
	b	M	b		AP9553
	b	M	F		AP2513
	F	F	b		AP2189
	F	b	M		AP9551
	F	M	b		AP9552
	B	b	b		AP2127 *AP2146
	b	b	B		AP2129 *AP2152
Cross	b	b	M	M	AP9000
	M	b	b	b	AP9776
	M	b	M	b	AP9778

- Notes: 1. F = Female 24 deg. Flareless port,
M = Male 24 deg. Flareless port,
B = Bulkhead 24 deg. Flareless male port,
b = Tube Braze port.
2. * = A different part number assigned for reducers.