

de HAVILLAND

CAGE CODE 71867

DESIGN STANDARD

1.0 General

- 1.1 This standard defines the plug end configuration for MAGNEFORM type end fittings to be used with aluminum alloy tubes.
- 1.1.1. MAGNEFORM refers to the process of forming or assembling tubular metal products using magnetic pulse energy.
- 1.2 TENSION type end fittings shall be used for all applications where the forces acting on the assembly are primarily in tension. Refer to Figure 1 for detail definition of TENSION type end fitting.
- 1.3 TENSION/TORSION type end fittings shall be used for applications where the forces acting on the assembly are a combination of tension and torsion. Refer to Figure 2 for detail definition of TENSION/TORSION type end fitting.
- 1.4 TORSION type end fittings shall be used for applications where the forces acting on the assembly are primarily in torsion. Refer to Figure 3 for detail definition of TORSION type end fitting.
- 1.5 Dimensional data for specific size end fittings, based on tube diameter and wall thickness, are listed in Table 1.

2.0 PART NUMBER EXAMPLE

DS63-22 ()

NO LETTER SUFFIX DENOTES TENSION PLUG CONFIGURATION
3 TRANSVERSE GROOVES - SEE FIGURE 1.
SUFFIX "G" DENOTES TENSION/TORSION PLUG CONFIGURATION
4 LONGITUDINAL GROOVES + 3 TRANSVERSE GROOVES - SEE
FIGURE 2.
SUFFIX "T" DENOTES TORSION PLUG CONFIGURATION
4 LONGITUDINAL GROOVES + 2 TRANSVERSE GROOVES - SEE
FIGURE 3.

TUBE O.D. & WALL THICKNESS DASH NUMBER
-22 = 1 1/4" O.D. X .028" WALL THICKNESS

BASIC PART NUMBER

LIST OF CURRENT SHEETS

PAGE	1	2	3	4	5	6	7				
REVISION	H	G	U	C	H	B	A				

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	GUNG	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	SCHRATTNER		
STRESSED			PAGE 1 OF 7
APPROVED	BINNINGTON		

REV. H - 12 SEP 97

REV. G - 12 AUG 97

REV. F - 21 FEB 97

APPROVED: 30 OCT 64

de HAVILLAND

CAGE CODE 71867

DESIGN STANDARD

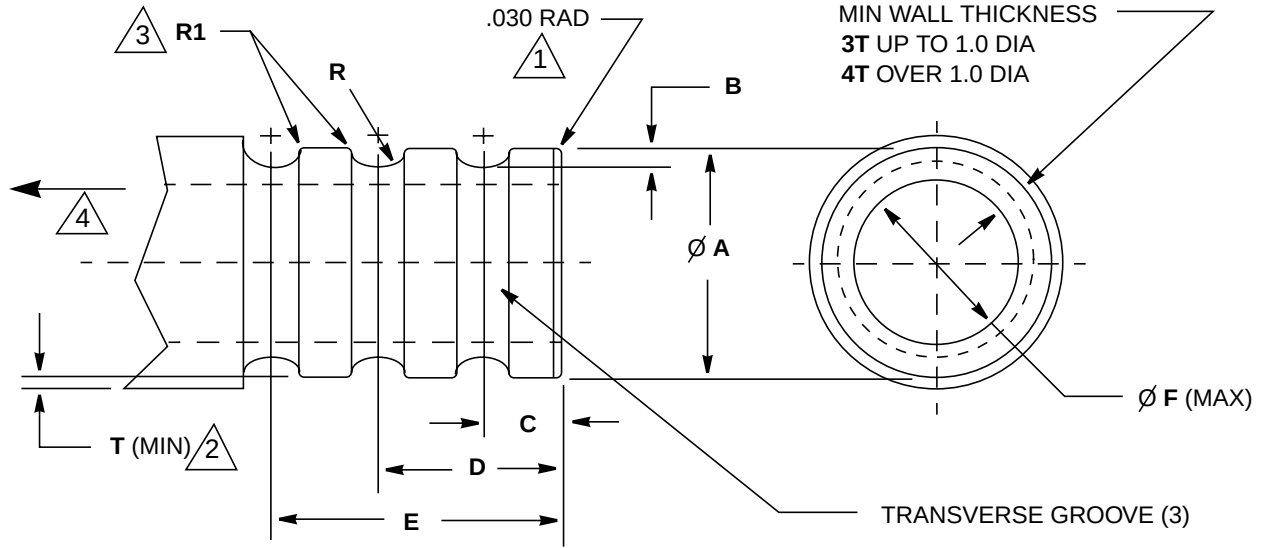
3.0 References:

- 3.1 PPS 1.08 - Magnetic Pulse Forming of End Fittings to Control Rods
- 3.2 CSP 291 - Magneform End Fittings for Steel Tubes
- 3.3 CSP 316 - Magneform End Fittings for Aluminum Tubes

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	GUNG	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	SCHRATTNER		
STRESSED			
APPROVED	BINNINGTON		PAGE 2 OF 7

APPROVED: 30 OCT 64 REV. F - 21 FEB 97 REV. G - 12 SEP 97



NOTES:

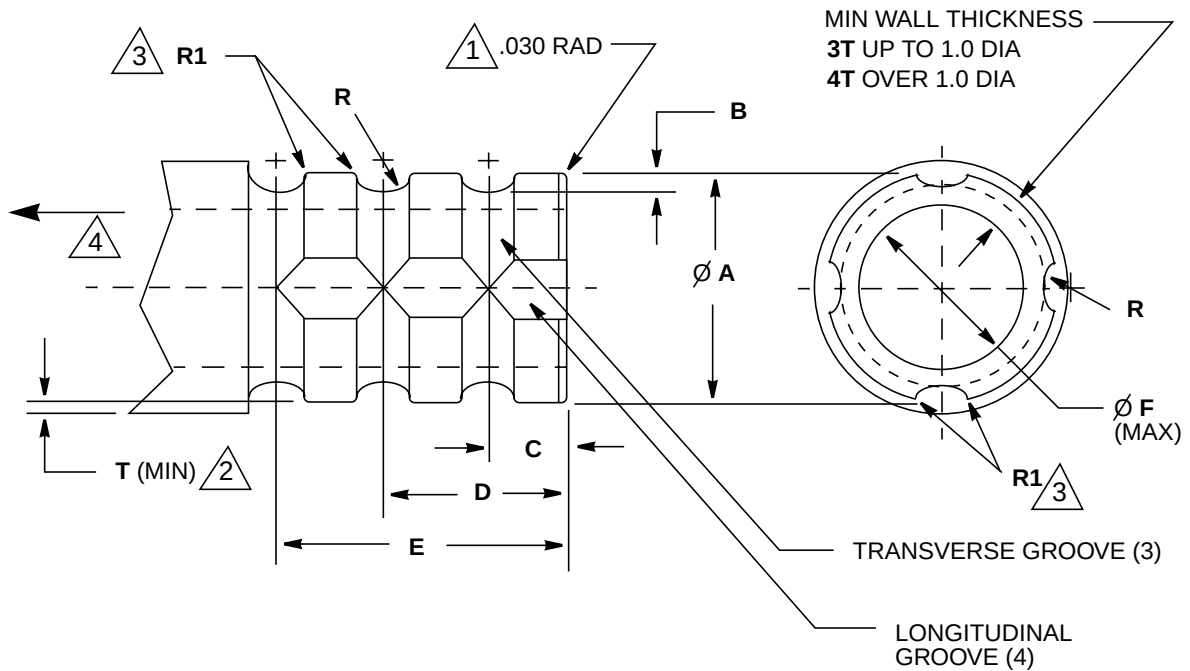
- 1 CORNER RAD TO BE SMOOTHLY BLENDED - NO SHARP EDGES.
- 2 "T" = WALL THICKNESS OF TUBE TO BE USED WITH PLUG END. SHOULDER IS REQUIRED FOR ALL PLUG ENDS.
- 3 GROOVE EDGE CORNER BREAK - REF TABLE 1.
- 4 ADAPTOR END DESIGN OPTIONAL - PLUG END TO BE AS SHOWN.
- 5. SURFACE ROUGHNESS $125\sqrt{\text{---}}$ MAX.
- 6. BREAK SHARP EDGES .015".

FIGURE 1 - TENSION PLUG END

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	GUNG	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	SCHRATTNER		
STRESSED			PAGE 3 OF 7
APPROVED	BINNINGTON		

de HAVILLAND
CAGE CODE 71867
DESIGN STANDARD



NOTES:

- 1 CORNER RAD TO BE SMOOTHLY BLENDED - NO SHARP EDGES.
- 2 "T" = WALL THICKNESS OF TUBE TO BE USED WITH PLUG END. SHOULDER IS REQUIRED FOR ALL PLUG ENDS.
- 3 GROOVE EDGE CORNER BREAK - REF TABLE 1.
- 4 ADAPTOR END DESIGN OPTIONAL - PLUG END TO BE AS SHOWN.
- 5. SURFACE ROUGHNESS $125\sqrt{\text{ }}$ MAX.
- 6. BREAK SHARP EDGES .015".

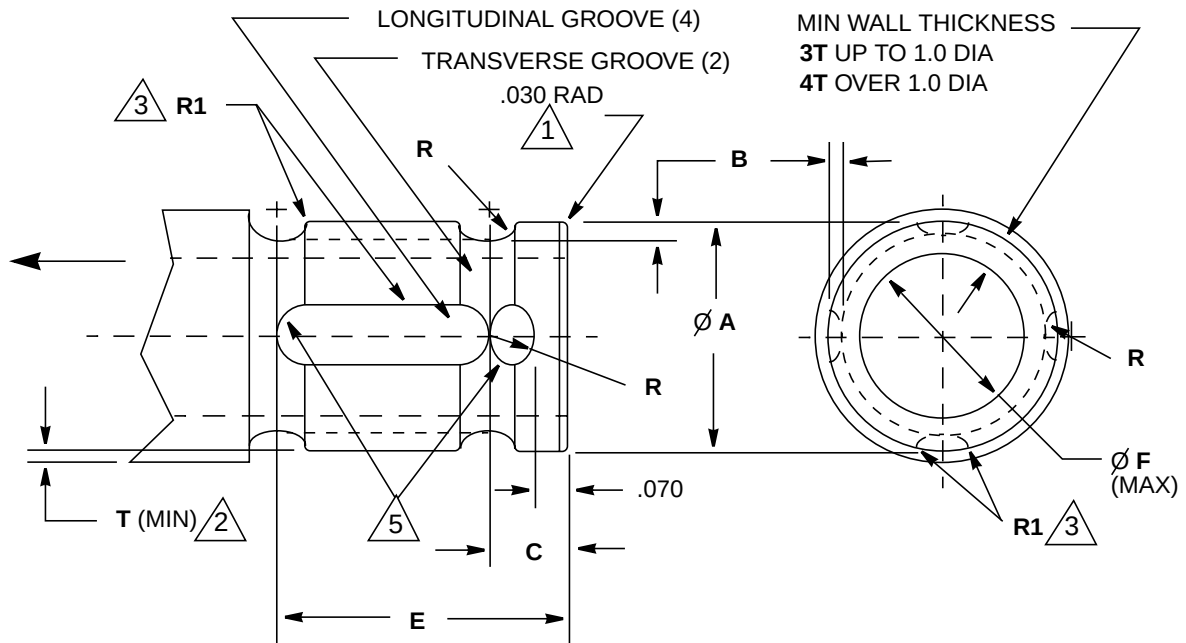
FIGURE 2 -TENSION/TORSION PLUG END

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	LINTS	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	RRK		PAGE 4 OF 7
STRESSED	RADZINS		
APPROVED	SCHRATTNER		

APPROVED: 30 OCT 64 REV. B - 21 FEB 97 REV. C - 12 SEP 97

de HAVILLAND
CAGE CODE 71867
DESIGN STANDARD



NOTES:

- $\triangle 1$ CORNER RAD TO BE SMOOTHLY BLENDED - NO SHARP EDGES.
- $\triangle 2$ "T" = WALL THICKNESS OF TUBE TO BE USED WITH PLUG END. SHOULDER IS REQUIRED FOR ALL PLUG ENDS.
- $\triangle 3$ GROOVE EDGE CORNER BREAK - REF TABLE 1.
- $\triangle 4$ ADAPTOR END DESIGN OPTIONAL - PLUG END TO BE AS SHOWN.
- $\triangle 5$ BREAK SHARP EDGE ONLY.
6. SURFACE ROUGHNESS $125\sqrt{\text{---}}$ MAX.
7. BREAK SHARP EDGES .015".

FIGURE 3 - TORSION PLUG END

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	GUNG	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	SCHRATTNER		PAGE 5 OF 7
STRESSED			
APPROVED	BINNINGTON		

APPROVED: 30 OCT 64 REV. F - 21 FEB 97 REV. G - 16 DEC 96 REV. H - 12 SEP 97

de HAVILLAND

CAGE CODE 71867

DESIGN STANDARD

Table 1: PLUG END - DIMENSIONS

DASH NO.	TUBE		A DIA ± .001	B ± .002	C ± .010	D ± .010	E ± .010	F DIA MAX.	R ± .010	R1 ± .010
	O.D.	WALL THK								
-1	1/2	.028	.440	.040	.200	.450	.700	.276	.080	.040
-2		.035	.426		.210	.510	.810	.220	.100	
-2A		.049	.398		.210	.510	.810	.108	.100	
-3	5/8	.028	.566	.050	.200	.450	.700	.401	.080	.040
-4		.035	.551		.210	.510	.810	.345	.100	
-5		.049	.523		.210	.510	.810	.233	.100	
-5A		.058	.504		.210	.510	.810	.161	.100	
-6	3/4	.028	.688	.050	.200	.450	.700	.526	.080	.040
-7		.035	.676		.210	.510	.810	.470	.100	
-8		.049	.645		.210	.510	.810	.358	.100	
-8A		.058	.632		.230	.600	.970	.286	.130	.050
-9		.065	.615		.230	.600	.970	.230	.130	
-10	7/8	.028	.816	.060	.210	.470	.730	.651	.080	.040
-11		.035	.801		.210	.510	.810	.595	.100	
-12		.049	.773		.210	.510	.810	.483	.100	
-13		.065	.737		.230	.600	.970	.355	.130	.060
-14	1	.028	.941	.060	.210	.470	.730	.776	.080	.040
-15		.035	.926		.210	.510	.810	.720	.100	
-16		.049	.898		.210	.510	.810	.608	.100	
-17		.065	.865		.230	.600	.970	.480	.130	.060
-18	1 1/8	.028	1.066	.060	.210	.470	.730	.845	.080	.040
-19		.035	1.051		.210	.510	.810	.775	.100	
-20		.049	1.020		.210	.510	.810	.635	.100	
-21		.065	.990		.230	.600	.970	.475	.130	.060
-21A		.083	.954		.230	.600	.970	.295	.130	

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	B. McDONALD	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	J. ROTSCH		
STRESSED			PAGE 6 OF 7
APPROVED	S. HAMID		

REV. A - 12 AUG 97
REV. B - 12 SEP 97
APPROVED: 21 FEB 97

de HAVILLAND

CAGE CODE 71867

DESIGN STANDARD

Table 1: PLUG END - DIMENSIONS

DASH NO.	TUBE		A DIA ± .001	B ± .002	C ± .010	D ± .010	E ± .010	F DIA MAX.	R ± .010	R1 ± .010
	O.D.	WALL THK								
-22	1 1/4	.028	1.191	.070	.260	.630	1.000	.970	.130	.060
-23		.035	1.176		.260	.630	1.000	.900	.130	
-24		.049	1.147		.260	.630	1.000	.760	.130	
-24A		.058	1.128		.260	.630	1.000	.670	.130	
-25		.065	1.115		.260	.630	1.000	.600	.130	
-25A		.083	1.080		.260	.630	1.000	.420	.130	
-26	1 3/8	.028	1.316	.070	.260	.630	1.000	1.095	.130	.060
-27		.035	1.301		.260	.630	1.000	1.025	.130	
-28		.049	1.272		.260	.630	1.000	.885	.130	
-28A		.058	1.250		.260	.630	1.000	.795	.130	
-29		.065	1.240		.260	.630	1.000	.725	.130	
-30	1 1/2	.028	1.441	.070	.260	.630	1.000	1.220	.130	.060
-31		.035	1.426		.260	.630	1.000	1.150	.130	
-32		.049	1.397		.260	.630	1.000	1.010	.130	
-32A		.058	1.380		.260	.630	1.000	.920	.130	
-33		.065	1.365		.260	.630	1.000	.850	.130	
-33A		.083	1.330		.260	.630	1.000	.670	.130	
-34	3/8	.028	.316	.050	.200	.450	.700	.151	.080	.040
-35		.035	.301		.210	.510	.810	.095	.100	
-36	1 5/8	.035	1.550	.070	.260	.630	1.000	1.275	.130	.060
-37		.049	1.522		.260	.630	1.000	1.135	.130	
-38		.058	1.504		.260	.630	1.000	1.045	.130	
-39		.065	1.490		.260	.630	1.000	.975	.130	
-40	1 3/4	.035	1.675	.070	.260	.630	1.000	1.400	.130	.060
-41		.049	1.647		.260	.630	1.000	1.260	.130	
-42		.058	1.629		.260	.630	1.000	1.170	.130	
-43		.065	1.615		.260	.630	1.000	1.100	.130	

SEE ENGINEERING STANDARDS APPROVAL RECORD FOR ORIGINAL SIGNATURES AND CHANGE SUMMARY

DRAWN	B. McDONALD	PLUG - END DETAILS - MAGNEFORM END FITTINGS - ALUMINUM TUBE ASSY'S	DS 63
CHECKED	J. ROTSCH		
STRESSED			PAGE 7 OF 7
APPROVED	S. HAMID		

REV. A - 12 SEP 97
APPROVED: 21 FEB 97