GOODRICH

Landing Gear

TITLE **ALUMINUM MATERIAL FOR NAMEPLATES AND FOIL LABELS**

DOCUMENT NO. **LGMS 3001**

REVISION **A**

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APPROVALS

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Revisions Record

REV	DESCRIPTION	APPROVALS
NC	Initial Release	September 17, 2012 E. Cochien B. Evans K. Williamson R. Panza-Giosa P. Lavigne
A	Updated references to AMS-QQ-A-250/1. Added paragraph 4.1.3. Added section 6.0 for finished nameplate requirements.	E. Cochien

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1.0 SCOPE

1.1 This document specifies the materials and test requirements for aluminum nameplates and foil labels.

2.0 CLASSIFICATION

2.1 Type I: silver lettering on black background

2.2 Type II: silver lettering on coloured background

3.0 REFERENCES

3.1	MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
3.2	GG-P-455	Plates and Foils, Photographic (Photosensitive Anodized Aluminum)
3.3	MIL-DTL-15024	Plates, Tags, and Bands for Identification of Equipment

4.0 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 Type I: photosensitive anodized aluminum impregnated with silver compounds, 1100 alloy having chemical composition per AMS-QQ-A-250/1 or ASTM B209, anodized per MIL-A-8625 Type II, certified as capable of meeting MIL-DTL-15024 Type H. Finished part graphics shall be silver halide compounds that are black in color and which are sealed within the anodic layer, treated with a gold based toning solution (Horizons Image Intensifier or equivalent) prior to sealing for enhanced heat and salt spray resistance.

4.1.2 Type II: 1100 aluminum alloy having chemical composition per AMS-QQ-A-250/1 or ASTM B209, with a photosensitive resist coating, anodized per MIL-A-8625 Type II and impregnated with required colour dye or ink prior to sealing, image produced by photographic and dye insertion process. Optional material: 1100 aluminum alloy having chemical composition per AMS-QQ-A-250/1 or ASTM B209 without a photosensitive resist coating, anodized per MIL-A-8625 Type II, image produced by screen printing required colour dye or ink.

4.1.3 Type I raw material may be processed to create a Type II nameplate.

4.1.4 If not stated on the engineering drawing, either matte or satin finish is acceptable.

4.1.5 For Type II nameplates, the background colour call-out is based on an approximation of a FED-STD-595 colour number.

4.2 Equipment

4.2.1 Horizon Zip® machine

4.2.2 F100 spectrophotometer

5.0 RAW MATERIAL TEST REQUIREMENTS

5.1 For Type I Nameplates (Silver Lettering on Black Background):

5.1.1 In lieu of test requirements specified in MIL-DTL-15024 or GG-P-455, the following acceptance tests shall be performed by the raw material supplier:

5.1.1.1 Monthly anodic coating weight per MIL-A-8625 Type II.

5.1.1.2 Anodic coating thickness per GG-P-455, measured once for each coil as it is anodized.

5.1.1.3 Monthly Taber abrasion shall be not less than 7000 cycles when tested per GG-P-455 on randomly selected lots.

5.1.1.4 Annual salt spray corrosion resistance shall be 336 hours min. per MIL-A-8625.

5.1.1.5 Image quality tested per section 5.3, sampled approximately every 1500 feet of coil.

5.1.1.6 Fog level tested per section 5.3, sampled approximately every 1500 feet of coil.

5.2 For Type II Nameplates (Silver Lettering on Coloured Background):

5.2.1 In lieu of test requirements specified in MIL-DTL-15024 or GG-P-455, the following acceptance tests shall be performed by the raw material supplier:

5.2.1.1 Monthly anodic coating weight per MIL-A-8625 Type II.

5.2.1.2 Anodic coating thickness per GG-P-455 measured once for each coil as it is anodized.

5.2.1.3 Monthly Taber abrasion shall be not less than 7000 cycles per GG-P-455 on randomly selected lots.

5.2.1.4 Annual salt spray corrosion resistance shall be 336 hours min. per MIL-A-8625.

5.3 Image Quality and Fog Level Tests

5.3.1 Test plates shall be exposed for 30 seconds to a 600 watt light source, processed face down through a Horizon Zip® machine at approximately 12.5 rpm, rinsed, checked for fog by clearing a 1" dia. area with potassium ferricyanide, and sealed for a minimum of 15 minutes.

5.3.2 Test plates will be evaluated via a spectrophotometer.

5.3.3 The black portion of the image is assigned a number value from one to five according to CIE L*A*B* values per Table 1. A minimum value of 3 is acceptable.

5.3.4 Fog level of the silver portion of the image is the difference between the background (uncleared) whiteness CIE L-value and the whiteness CIE L-value of the cleared area. A value of <1.00 is acceptable.

Table 1: CIE L*A*B* Color Standard Values, measured using an F100 spectrophotometer

		FIVE	FOUR	THREE	TWO	ONE
Image Colour (matte)	L	<26.00	26.00 – 27.99	28.00 – 30.00	30.01 – 32.00	>32.00
	A	<-0.30	-0.30 – 0.44	0.45 – 1.20	1.21 – 1.95	>1.95
	B	<-1.60	-1.60 – -0.11	-0.10 – 1.40	1.41 – 2.90	>2.90
Image Colour (satin)	L	<26.80	26.80 – 29.00	29.01 – 31.25	31.26 – 33.50	>33.50
	A	<-0.30	-0.30 – 0.44	0.45 – 1.20	1.21 – 1.95	>1.95
	B	<-1.60	-1.60 – -0.11	-0.10 – 1.40	1.41 – 2.90	>2.90
Background Whiteness (matte)	L	>85.00	84.99 – 83.50	83.49 – 80.25	80.24 – 79.50	<79.50
Background Whiteness (satin)	L	>86.00	86.00 – 84.00	83.99 – 80.00	79.99 – 79.00	<79.00

6.0 FINISHED NAMEPLATE REQUIREMENTS

6.1 The finished nameplate shall be certified by the nameplate vendor as having been manufactured to either the Type I or Type II process per this spec.

6.2 The raw material supplier shall certify the aluminum as being tested per LGMS 3001.