

ALP Lighting Components, Inc.

09/26/06 - Revision

Anodized Aluminum Lighting Sheet Procurement Specifications

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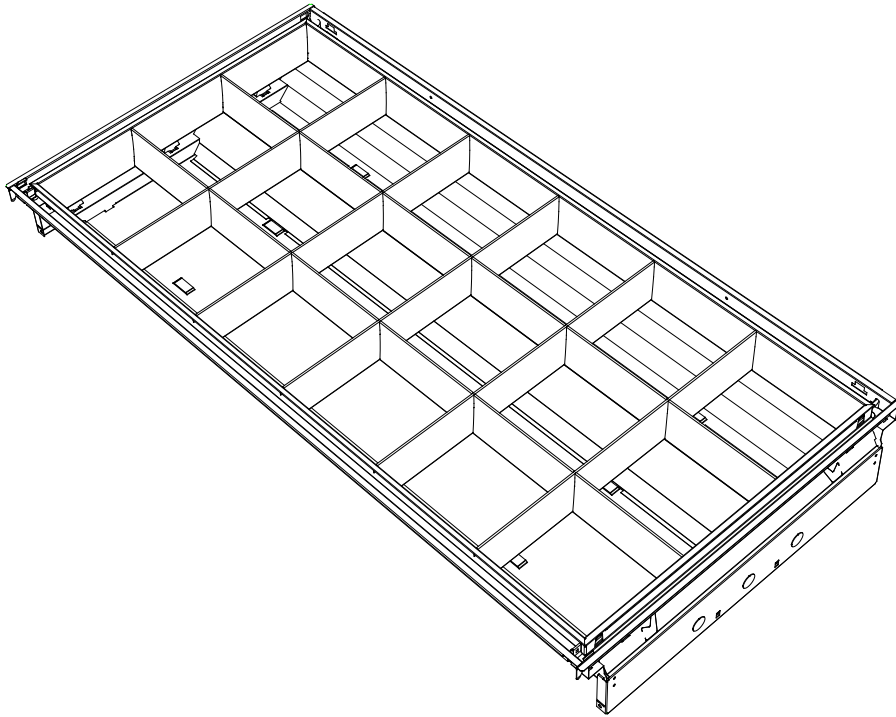
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ANODIZED ALUMINUM LIGHTING SHEET SPECIFICATION

THE FOLLOWING PROCUREMENT SPECIFICATION SETS FORTH ALP'S REQUIREMENTS FOR ANODIZED ALUMINUM LIGHTING SHEET. THESE COMPONENTS WILL BE EITHER ROLL FORMED OR FABRICATED USING PROGRESSIVE DIE PUNCHING AND FORMING. SPECIAL REQUIREMENTS AND EXCEPTIONS/DEVIATIONS SHALL BE SPECIFICALLY NEGOTIATED AND DOCUMENTED ON THE ALP PURCHASE ORDER.



SPECIFICATION

1.0 DIMENSIONAL PROPERTIES

1.1 COIL WIDTH TOLERANCE: +/- 0.005"

1.2 MATERIAL THICKNESS TOLERANCE: +/- 0.002"

1.3 FLATNESS TOLERANCE: 0.060" MAXIMUM DEVIATION FROM FLAT OVER A 24" LENGTH

1.4 BURR: NOT TO EXCEED 0.001"

1.5 CAMBER: NOT TO EXCEED 0.125" OVER 6 FOOT LENGTH

1.6 EDGE WAVE: NOT TO EXCEED 0.125"

1.7 COIL SIZE:

MATERIAL THICKNESS (INCHES)	COIL WIDTH (INCHES)	INSIDE DIAMETER (INCHES)	MAXIMUM OUTSIDE DIAMETER (INCHES)
0.014/0.016	ALL	20	42
0.020	ALL	20	42

1.8 WRAP DIRECTION: REFLECTIVE SIDE (SHOW SURFACE) TO OUTSIDE DIAMETER AND CLOCKWISE PAYOFF DIRECTION.

2.0 MECHANICAL PROPERTIES

FINISH	MATERIAL THICKNESS	TENSILE STRENGTH (KSI)		YIELD STRENGTH (KSI)		PERCENT ELONGATION	
		RANGE	TYPICAL	RANGE	TYPICAL	RANGE	TYPICAL
SEMI-SPECULAR LI	.014/.016	26 - 31	28.5	27 - 30	28	2 - 6	4
SPECULAR LI	.014/.016	26 - 31	28.5	24 - 27	25.5	2 - 6	4
SEMI-SPECULAR LI	0.020"	21 - 26	23	19-22	20	5 - 10	7
SPECULAR LI	0.020"	20 - 25	22	19-22	20	5 - 10	7
MIRO 4	.014/.016	26 - 31	28.5	24 - 27	25.5	2 - 6	4
HIGH REFLECTANCE WHITE	.016	22 MIN	24	18 MIN	22	2-6	4
MATT WHITE	.016	23 MIN	24	18 MIN	22	2 - 6	4

NOTE: PERCENT ELONGATION IN 2 INCHES FOR 1/16" SAMPLE.

3.0 OPTICAL PROPERTIES

FINISH	MATERIAL THICKNESS	TOTAL REFLECTANCE	IMAGE CLARITY	DIFFUSENESS @ 15 DEGREES	SPECULAR REFLECTANCE
SEMI-SPECULAR LI	.014/.016"	84% MIN	35 – 55	0.15 – 0.35	10 – 25
SPECULAR LI	.014/.016	86% MIN	88 MIN	< 0.01	65 – 75
SEMI-SPECULAR LI	0.020"	84% MIN	35 – 55	0.25 – 0.40	10 – 25
SPECULAR LI	0.020"	86% MIN	82 – 87	< 0.05	50 – 60
MIRO 4	.014/.016	94% MIN	95 MIN	< 0.01	90
HIGH REFLECTANCE WHITE	.016	91% MIN	N/A	N/A	N/A
MATT WHITE	.016	90% MIN	N/A	N/A	N/A

Notes:

REFLECTIVITY AS MEASURED BY A DIANO TR-1 OR TECHDYNE TR-2 TOTAL REFLECTOMETER MANUFACTURED BY TECHDYNE CORPORATION, NEW ALBANY, INDIANA.

IMAGE CLARITY AND DIFFUSENESS AS MEASURED BY A DORIGON D-47 GLOSSMETER MANUFACTURED BY HUNTER ASSOCIATES LABORATORY, FAIRFAX, VIRGINIA.

4.0 ANODIC COATING PROPERTIES AND MATERIAL IDENTIFICATION

FINISH	MATERIAL THICKNESS	COATING PROPERTIES	
		THICKNESS	TOLERANCE
SEMI-SPECULAR LI	0.016"	3 MICRONS	+/- 0.5 MICRONS
SPECULAR LI	0.016"	2.25 MICRONS	+/- 0.5 MICRONS
SEMI-SPECULAR LI	0.020"	3 MICRONS	+/- 0.5 MICRONS
SPECULAR LI	0.020"	3 MICRONS	+/- 0.5 MICRONS
MIRO 4	0.016"	2.25 MICRONS	+/- 0.5 MICRONS

Notes: ALL COILS EXCEPT PRE-PAINT MUST HAVE IDENTIFYING STRIP.

ALL FINISHES MUST RESIST STAIN AS TESTED BY ASTM B136.

IDENTIFYING STRIPE IS A COLOR STRIPE ON THE BACK OF THE MATERIAL THAT DENOTES ITS FINISH.

5.0 VISUAL COSMETIC CRITERIA

MATERIAL SHALL BE FREE FROM THE FOLLOWING DEFECTS:

CRAZING, SCRATCHES, RUB MARKS, GOUGES, ABRASIONS, STREAKS, BLISTERS, INCLUSIONS & STAINING.

6.0 CERTIFICATE OF INSPECTION AND TEST RESULTS

A CERTIFICATE OF INSPECTION AND TEST RESULTS MUST ACCOMPANY EACH SHIPMENT. THIS CERTIFICATE MUST INCLUDE MATERIAL THICKNESS, YIELD STRENGTH, TENSILE STRENGTH, PERCENT ELONGATION, REFLECTIVITY, IMAGE CLARITY, SPECULAR REFLECTANCE AND DIFFUSENESS READINGS FOR THE SUPPLIED MATERIAL. A STICKER WITH A UNIQUE PALLET NUMBER WILL BE ATTACHED TO EACH PALLET AND A STICKER WILL BE PLACED IN EACH COIL FIBER CORE IDENTIFYING A HEAT NUMBER. THESE NUMBERS WILL SERVE AS THE CROSS-REFERENCE TO THE CERTIFICATE INFORMATION.

7.0 PACKAGING

SUPPLIER MUST HAVE THEIR OWN PACKAGING SPECIFICATIONS APPROVED BY ALP OR COMPLY WITH THE PACKAGING SPECIFICATIONS THAT FOLLOW.

1. PALLETS SHALL BE AT LEAST 2" LONGER THAN THE COIL AND NO MORE THAN 6" WIDER THAN THE COIL.
2. PALLETS WILL HAVE PLYWOOD DECKBOARDS AT LEAST 1.00" THICK AND AT LEAST THREE 3.15" X 4.00" STRINGERS.
3. COILS ARE TO BE PLACED ON THE PALLET "EYE TO THE SKY". STACK HEIGHT SHOULD NOT EXCEED THE OUTSIDE DIAMETER OF THE COILS ON THE PALLET.
4. EACH COIL IS TO HAVE A FIBER CORE INSERT.
5. EACH COIL IS TO BE WRAPPED IN A PAPER OR PLASTIC VAPOR BARRIER.
6. SPACERS ON THE WIDER COILS SHOULD BE MINIMUM 2" CHIP BOARD OR EQUIVALENT (NO SOLID WOOD WILL BE USED). SPACERS MAY BE MADE OF PLASTIC, CARDBOARD, OR AN APPROVED MATERIAL THAT WILL NOT INTRODUCE MOISTURE INTO THE ALUMINUM. SPACERS SHOULD BE LONG ENOUGH TO RUN THE LENGTH BETWEEN THE ID AND OD OF THE COIL. AT LEAST THREE SPACERS MUST BE PLACED BETWEEN EACH COIL. ON THE NARROWER COILS CORRUGATED SHEETS SHALL SEPARATE THE COILS. THESE SHEETS SHOULD BE AT LEAST AS LARGE AS THE OD OF THE COILS.
7. COILS SHOULD HAVE AT LEAST THREE 1/2" WIDE STRAPPING BANDS AROUND IT'S TO SECURE THEM TOGETHER AND AT LEAST THREE STRAPPING BANDS TO SECURE THE TOP BOARD AND THE BOTTOM DECKBOARD.
8. PALLET WEIGHT WITH MATERIAL NOT TO EXCEED 1500 LBS.

8.0 PAINTING SPECIFICATIONS

FINISH	TOTAL REFL.	TOTAL REFLECTION	
		DIFFUSE REFLECTION	TR-2
HIGH REFLECTANCE WHITE	91	84.8	91
MATT WHITE	90	83.0	90

PAIN T TYPES

PRE-PAINT WHITE – HIGH GRADE NON YELLOWING UV RESISTANT POLYMER.

MATT WHITE – HIGH GRADE NON YELLOWING UV RESISTANT POLYMER.

TESTING REQUIRED

CROSS HATCH – NO PAINT PICK OFF

OT-IT BEND TEST – NO OPBIOUS FRACTURING OR BILSTERING OF PAINT, NO PICK OFF.

9.0 ADDITIONAL SPECIFICATIONS

1. COILS MUST NOT CONTAIN ANY FILLER STRIPS BETWEEN WRAPS