



General Inspection and Material Specifications



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1. Introduction

This specification sets forth general guidelines for use by A.L.P. and its suppliers. This document is to be used for inspection criteria and material selection for factories and authorized contract manufacturers. Additional Documents are:

ALP Anodized Aluminum Specification rev 9-26-06

ALP CRS Specification Rev 12-15-05

ALP pre and Post Painted Steel Specification Rev 3-6-2024

2. Scope

This specification applies to all parts produced for or by A.L.P. Optical and its suppliers.

3. Purpose

The purpose of this document is to establish acceptance and rejection criteria including materials for customer shippable parts, assemblies and final products that are manufactured for A.L.P. This document is broken into two distinct sections/ guidelines: General Inspection requirements and approved materials by classification.

4. Containment

Internal control of non-conforming product per work instruction C1-08-QW-0010

5. Order of Documentation Precedence for Inspection

In the event of conflict between documents, the following will take order of precedence:

1. Part samples approved and/or supplied by A.L.P., Inc. will be used as a standard of acceptable cosmetic surfaces.
2. Written A.L.P. approved deviation from the guidelines specified within this document.
3. Specifications defined by A.L.P. engineering part or assembly drawing.

3.1 Note: Part temperature during measurement should be considered. The thermal effects vary dependent on material type. See [Section 8](#) under Thermal Expansion/Contraction.

4. Product specific requirements document.
5. General specifications guidelines specified within this document.

6. Surface Classification

6.1 Surface Classification

- Class A Surface – SPI A(X) finish surfaces or print specified viewable surfaces
- Class B Surface – SPI C(X) finish or better and textured surfaces
- Class C Surface – any other surface not defined on print.

7. Inspection Requirements

7.1. General Inspection Requirements:

Inspection by A.L.P. and/or its suppliers shall use the time and distance method as described below. The standards defined in this document shall be used for training personnel and to visually check surface quality using “Accept / Reject” decisions.

7.2. Viewing Conditions:

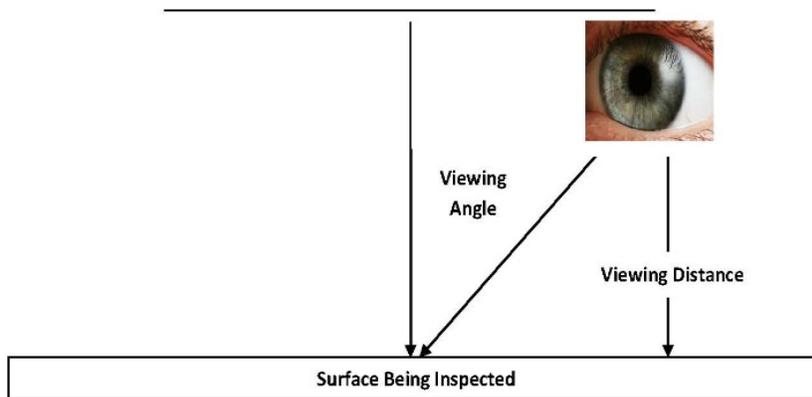
All inspections will be made under normal artificial lighting, unaided and viewed in a manner that duplicates the typical end use of the product. During inspection, only visual qualities (appearance) of the part surface shall be considered.

7.2.1 Inspection Criteria:

- Inspection shall be conducted using the unaided eye.
- Viewing distance shall be 15 inches to 30 inches as specified by classes.
- Light sources shall maintain a minimum of 20 foot-candles at inspection surface.
- Surfaces shall be viewed without the aid of magnification, at an approximate 45° angle to the normal of the surface to be inspected.

Codes	Class A Surface	Class B Surface	Class C Surface
Viewing Distance	15 in	30 in	30 in
Viewing Time	5 seconds	3 seconds	3 seconds
Viewing Area	Entire area	60 in ² (387 cm ²)	50 in ² (322 cm ²)
Viewing Angle	All angles possible	All angles possible	All angles possible

NOTE: Class A surfaces shall be manipulated during the inspection process to achieve maximum reflection of the light source. Manipulation time should not account as viewing time. Additionally, parts will be held such that the light is NOT REFLECTED directly into the viewer. (see below)



7.3 Defect Definitions

- **Bleeding/Smearing** – Evidence of one color overlapping or altering another color (paint). Spreading of pigment beyond the intended boundaries (silk screen, printing)
- **Blush** – Dull discolored or whitish area, usually in gate area
- **Bubble** – Round or irregular shaped areas with no material
- **Burn** – Uneven coloration or marks on a surface due to overheating
- **Chip** – Fractured material that is missing from the molded part
- **Cold flow** – Wavy or streaked appearance on a part surface, also called record grooving
- **Contaminant/contamination/black spec** – Foreign matter sub-surface or on the surface of the part, applies to molded parts, painted/printed and silk-screened parts
- **Crack** – Fractured material which generally appears as a line or scratch.
- **Crazing**- Multiple tiny cracks due to stress exerted on the part
- **Delamination** – Separation of plastic surface layer, looks like flaking or onion skinning
- **Discoloration/Marbling** – Changes from specified color or inconsistent color within the same part
- **Drag** – Fine lines that are scrapes in the line of draw
- **Dross/slag** – Re-solidified material on the surface of part after laser cutting
- **Dry Spray** – Dull and Rough sandpaper like coating usually caused by solvent evaporating too quickly
- **Fill-Ins**- (Print or Silk Screen) An excessive use of ink that alters the form of screened or printed feature. Placement of ink where no ink should be.
- **Flash** – Extra material on part after ejection; normally occurs at parting line, ejector pins, or insert lines
- **Flow lines** – Visible abnormality formed by the direction of flow in the part
- **Gel**- Dot or Fisheye in Extruded part caused by contamination
- **Gouge** – Surface imperfections, deeper than a scratch, appears as material missing below the part's surface
- **Grease**- Any type of machine lubrication on the surface of the part
- **Knit-line/weld-line** – Line where plastic flows meet in the part and not fused properly
- **Milkiness/Haze** – Cloudy appearance in part
- **Non-Adhesion**- Lack of adequate sticking of paint, print or any coating to the plastic surface

- **Non-fills** – Part incomplete, generally occurs near end of flow
- **Orange Peel**- Rippled or mottled appearance viewable as concentric lines
- **Runs**- Dripping or Sagging of paint or ink, movement of ink beyond intended surfaces
- **Scratch** – Surface imperfection less than a gouge, defects on the surface of the parts
- **Sharp edges**- formed by parting or insert lines creating flash.
- **Silver streak/Splay** – Generally caused by material shear and appear as white streaks in part
- **Sink** – depressions/dimples in part that are usually adjacent to thick areas
- **Void** – Empty space left from material shrink
- **Suction Cup Marks**: “Pick & Place” units utilize suction cups to remove parts from the mold. If critical process parameters are not properly controlled, permanent physical indentations can lead to unacceptable appearance.
- **White/Bright Spots**: Clearly visible small areas that appear in the edgelit panel when lit-up are typically the result of missing or partially formed optical lens, “chips or cuts” in the panel surface or surface contamination which concentrates and funnels light through a restricted, small area. In many cases, surface contamination can be removed without damage to the waveguide.
- **Head-Lighting**: Striations of light that emanate from the LED coupling edge of the edgelit panel when lit-up. Common causes for head-lighting are non-uniform/incomplete optical lens formation and/or an excessive gap between the LEDs and waveguide.

8. General Inspection Requirements for Injection Molded Parts

- Acceptable Class A, Class B or Class C surface defects should not affect fit or function of part. If the fit or function is affected, the parts must be rejected.
- For general inspection requirements and viewing conditions, refer to Section 5: Surface Cosmetics / Inspection Requirements.
- Thermal Expansion/Contraction
 - When measuring parts, normalized temperature is expected to be 72.0° F (22° C)
 - When normalized temperatures are not available an adjustment of .00037” in/in/°F shall be used for Acrylic dimensions
 - When normalized temperatures are not available an adjustment of .00033” in/in/°F shall be used for Polycarbonate dimensions
- Tolerances if not specified on drawing
 - X.X ±0.1
 - X.XX ±0.03
 - X.XXX ±0.015
 - X.XXXX ±0.005
 - Angles ±1°

8.1 Prismatic Lenses, TIR Lenses (single source lenses), and Reflexors

- Gloves are recommended
- Handling of parts only on non-optical areas
- Verify proper material
- Non-fills: Not acceptable
- Flash: None allowed, trim all flash.

- Silver streaking: Acceptable in non-optical areas, if not visible at arm's length
- Milkiness: Acceptable if not visible at arm's length
- Flow lines: Acceptable if not visible at arm's length
- Bubbles: Allowed in part, but should not exceed .050" in size and more than 5 per part
- Contamination:
 - Not acceptable in optical areas
 - Black specks should not exceed .050" in diameter and no more than 5 per part
 - No clusters allowed for reflexors
 - No oil or grease allowed
 - Parts may be Uvalex coated in the next operation
- Burning: Not acceptable
- Blush: Not acceptable
- Chipping, cracking: Not acceptable
- Minor scratches: allowed in non-optical areas if not seen at arm's length
- Crazeing: Not Acceptable
- Grease: Not acceptable

8.2 Edgelit Lenses

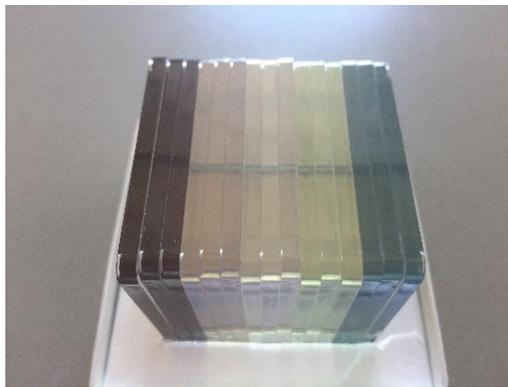
- Gloves are recommended
- Handling of parts only on non-optical areas
- Verify proper material
- All surfaces are class A
- Non-fills: Not acceptable
- Flash: None allowed, trim all flash.
- Silver streaking: Acceptable in non-optical areas, if not visible at arm's length
- Milkiness: Acceptable if not visible at arm's length
- Flow lines: Acceptable if not visible at arm's length
- Bubbles: Allowed in part, but should not exceed .050" in size and more than 5 per part
- White/bright spots: .050 max diameter 5 per part, 1 occurrence per 1 sq. in.
- Contamination:
 - Not acceptable in optical areas
 - Black specks should not exceed .050" in diameter and no more than 5 per part
 - No clusters
 - No oil or grease allowed
- Burning: Not acceptable
- Blush: Not acceptable
- Chipping, cracking: Not acceptable
- Suction Cup marks: not visible at arm's length
- Minor scratches: allowed in non-optical areas if not seen at arm's length
- Crazeing: Not Acceptable
- Grease: Not acceptable
- Headlighting: 2 inch max from optic pattern edge on light entry edge
- Bow and warp: reference Section 9.2.1

8.3 Non-optical Parts

- Gloves are recommended
- Verify proper material
- Non-fills: Not acceptable, sinks no worse than QC sample
- Flash: Not allowed, trim all to .015" max
- Silver streaking: Acceptable if not visible at arm's length
- Milkiness: Acceptable if not visible at arm's length
- Bubbles: Allowed in part, but should not exceed 0.100" and no more than 5 per part
- Contamination: Black specks should not exceed .050" in diameter and no more than 5 per part
- Burning: Not acceptable
- Chipping, cracking, scratching: Not acceptable
- Gate removal: Clip or mill flush to .030"
- Flow lines: Acceptable if not visible at arm's length
- Crazeing: Not Acceptable
- Grease: Not acceptable

8.4 Color

- Color shift of parts during in-process run should not exceed pre-determined variance. If more than 3% of parts fall out of range during a run the material will be subject to not approved status upon review.
 - Example 1 of Color Shift:
 - Center would be "normal"
 - Colors on outside would be considered outside of acceptable range
 - Colors adjacent to center would be acceptable



- Example 2 of color shift
 - Part on left is correct color, part on right would be rejected



9. General Inspection Requirements for Injection Molded Secondary Operation Parts

9.1 General Inspection for Machined parts

Quality Standards:

9.1.1 Sprue/gate removal :

- Sprue or gate may be clipped only
- For machined sprue or gates; gate will be flush to $+0.030''$
 - If there are optics present around the sprue or gate, machine flush too or below the tallest surrounding optic
- Blow off any dust/residue from mill/route operation

9.1.2 Gate removal (disk gate only):

- Mill or route gate through
- Cool as many parts as needed prior to cutting to achieve proper hole size when cooled
- Blow off any dust/residue from mill/route operation

9.1.3 Other:

Once per hour after cutting, based on BOM:

- Check hole size with go/no go gage located in QC lab
 - "Go" side must go into hole.
 - "No go" side must not go into hole. Notify your Supervisor if "No go" side goes into hole.
- Supervisor or designee must check rim of part with gage in QC lab. This gage must slide over rim completely around the perimeter.

- Notify your supervisor of any discrepancies
- Record result on pass/fail sheet

9.2 General Inspection for Laser and Router Cut parts

Quality Standards:

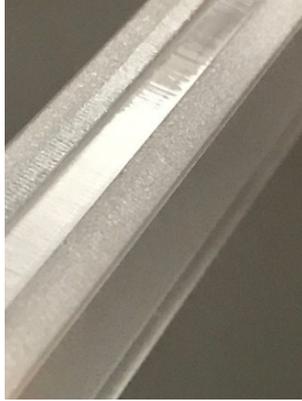
- Operator Instructions:
 - Handle sheets carefully to avoid scratching and pack with prism side down when possible
 - Must wear cotton gloves when handling and when laser cutting
- Must have drawing for cutting
- Specifications:

	Laser Cut Parts		Router Cut Parts
Range (in.)	< 25	25 - 50	All
Tolerances (in.)	±.025	±.050	±.030

- Residue/smoke/haze: Acceptable if not visible at arm's length
- Streaks: Acceptable if not visible at arm's length
- Dross/debris: None allowed, clear all debris
- Cut edge should appear square visually
- Slight warp: Acceptable
- Non-uniform warp: Not acceptable
- Chipping/cracking: Not acceptable
- Burning: Not acceptable
- For plastic sheet products, when RFI grid present:
 - Use 106009 grounding tape to correct any voids in L ground screening. L ground should not exceed 1/8 inch from edge of part.

9.2.1 General Inspection for Laser Cut Edgelit Parts

- All requirements from 9.2
- Bow and Warp:
 - Bow not to exceed 0.030" per 8 inches of length.
 - Ex. 0.015" for a 4" part and 0.060" for 16" part.
 - Warp not allowed:
 - Waviness or curled in two directions.
- Laser cut edge to appear smooth and polished (ref example photo
Part on left is half rough, half smooth not acceptable, part on right is all rough no smooth not acceptable, part in center is smooth and appears polished acceptable. See page 12.



9.3 General Inspection for Sonic Welded and Heat Staked parts

Quality Standards:

9.3.1 Sonic Welded plastic parts

- Verify proper Horn and welder for welding
- Misalignment between welded parts may vary ± 0.015 per print specification
- Dimensions at joint of assembled part may vary ± 0.015 due to the sonic welding process
- Trim any blow out/flash from welding
- Verify sonic weld is secure by physical test method
- Sonic Weld should appear visually regular, if irregular check with supervisor
- No burning

9.3.2 Sonic Welded inserts

- Verify proper Horn and welder for welding
- Verify proper insert is being used
- Verify all inserts are in part and welded to proper depth
- Verify inserts do not pull out, secondary tester may be required
- Trim blow out/flash around insert
- Boss/plastic not to be cracked after sonic welded insert

9.3.3 Heat Staked parts

- Ensure staked parts hold together as intended
- Stake should appear visually regularly shaped
- Trim any excess flash

9.4 General Inspection for Coated Parts

Quality Standards:

9.4.1 Metalized Parts

- Contamination:
 - Particles not to exceed .030" in size and no more than 3 per part
 - Hair-like particles not to exceed 1/16" length, none in parabolic area
 - Fingerprints are not acceptable on the molded or metallized surface
- Runs, drips, sags: None allowed, unless otherwise defined by a QC part
- Orange peel: Not acceptable, unless otherwise defined by a QC part
- Dry spray: None allowed, unless otherwise defined by a QC part
- Iridescent: Not acceptable, unless otherwise defined by a QC part
- Drop through: Not acceptable, unless otherwise defined by a QC part

- Mask line:
 - Keep uniform as possible
 - No metalizing on back side of reflector or bottom half of clips
- Warping: Not acceptable, unless otherwise defined by a QC part
- Light shot: Not acceptable, unless otherwise defined by a QC part
- Burning: Not acceptable, unless otherwise defined by a QC part
- Chamber Oil:
 - Not to exceed .030" in size, and no more than 3 per part
 - None allowed in parabolic area
- Topcoat application: Not acceptable on the outside of parts
- Application:
 - Evaporative 1st surface (first surface reflector)
 - Base coat Urethane (optional depending on substrate and application)
 - Evaporate 99.9999% pure aluminum
 - Top Coat- acrylic lacquer
 - Evaporative 2nd surface (for mirrors through substrate)
 - Base coat Urethane (optional depending on substrate and application)
 - Evaporate 99.99% pure aluminum
 - Back Coat- Grey Enamel
 - Sputtering – 1st surface (for first surface reflectors)
 - In-chamber plasma pre-treat
 - Sputter 99.9999% pure aluminum
 - In-chamber HMDSO (HexaMethyl Di-SilOxane) top coat
 - Sputtering – 2nd surface (for mirrors viewed through the substrate)
 - In-chamber plasma pre-treat
 - Sputter 99.9999% pure aluminum
 - In-chamber HMDSO (HexaMethyl Di-SilOxane) top coat
 - Back Coat- Grey Enamel

- Reflectivity Testing:
 - Shall be tested on a flat glass slide processed alongside the production parts.
 - Reflectivity to be a minimum of 85% across the visible spectrum (or using a gloss meter)
 - Cross hatch adhesion test to be performed on a representative sample following ASTM D3359

9.4.2 UV Protected Parts

- Coating thickness
 - minimum .15 mil.
- Contamination:
 - Dust particles in Uvalex is acceptable.
 - Hair like particles should not exceed 1" in length.
- Runs, drips and sags:
 - Per print specification, should not exceed 1/8" wide or 1" in length.
 - No more than 1 per part.
- Scratches, scuffs:
 - Per print specification, should not exceed 1" in length, or 1/8" wide.
 - No more than 1 per part.

9.4.3 Painted Parts

- Lens must be clear where applicable.
- No haze
- Blush on front not to exceed ¼" around sprue area.
- No contamination in 2nd surface coat.
- No discoloration
- No overspray except where allowed
- No scratches or scuffing in the painted area.
- Mask line must be uniform and even.
- Runs, drips, sags: None allowed, unless otherwise defined by a QC part
- No Grease allowed
- Pins holes acceptable when viewed at arm's length. No larger than .020" diameter and are no more than 5 per side and no clusters.

9.4.4 Printed and Silk Screened Parts

- Lens must be clear where applicable.
- No haze
- No discoloration
- No Bleeding except where allowed
- No Fill-Ins except where allowed
- No scratches or scuffing in the painted area.
- Mask line must be uniform and even.

- Runs, drips, sags: None allowed, unless otherwise defined by a QC part
- No Grease allowed
- Pins holes acceptable when viewed at arm's length. No larger than .020" diameter and are no more than 5 per side and no clusters.

9.4.5 General Inspection requirements for protective film application

- Scratches and visible imperfections acceptable if not through film
- Cuts and punctures .5 inch max if not in optic areas
- Wrinkles/bubbles acceptable provided part is covered
- Contamination none allowed in optic areas none above .030"
- Film adhesion .500 inch max separation from edge

10. General Inspection Requirements for Sheet Metal and Spun Parts

10.1 Reflective Surfaces

- Specular surface to be free of scratches, fingerprints, dirt, etc.
- No Sharp/Razor Edges

10.2 Painted

- Coating to be applied to all areas defined by print
- No overspray allowed where noted

11. General Inspection Requirements for Die Cast Parts

- Verify Material
- Incoming inspection
- Parts to meet print specification
- No through voids in cooling fins
- LED mounting surfaces to be flat +0.000/-0.005" within any diameter of 1.0"
- No non-fills in fins greater than .050" deep and/or .375" wide
- Flash:
 - Not to exceed .030" tall
 - None allowed around mount holes
- Date stamp required and accurate
- Any embossed text must be fully formed
- Ejection marks:
 - Not allowed on sealing or LED mounting surfaces
 - Must be flush to -.020"

11.1 Powder coated

- Coating to be applied to all areas defined by print

- No overspray allowed where noted
- Pin holes to be 0.030" max. Diameter and no more than 5 per part

12. General Inspection Requirements for Gaskets

12.1 Individual Gaskets

- Verify proper material
- Verify color
- Verify length
- Verify diameter and appears uniform

12.2 Formed in Place Gaskets

- Housing to be clean and free of contaminants prior to gasket injection
- Verify gasket material
- Verify proper mix ratio
- Verify gasket fully formed
- Verify gasket is uniform
- No:
 - Ripples
 - Bubbles
 - Gaps
 - Globs
 - Drips
 - Splatter
 - Other noticeable inconsistency
- Verify fully cured gasket height per drawing
- Cured Gasket height ± 0.020 "
- Start/stop point should not show excessive build up or low material

13. General Inspection Requirements for Thermoformed and Compression Molded Products

13.1 Compression Molded

- Minimum wall thickness .060"
- All features to be formed without cracks or aberrations
- Trim all flash to .015" max
- No voids/bubbles
- Ejection marks not allowed on sealing surfaces

13.2 Thermoformed

- Minimum wall thickness .045"

- All features to be formed without cracks or aberrations
- Trim all flash to .015 max
- No voids/bubbles

14. General Inspection Requirements for Extruded products

- Acceptable Class A, Class B or Class C surface defects should not affect fit or function of part. If the fit or function is affected, the parts must be rejected.
- For general inspection requirements and viewing conditions, refer to [Section 6: Surface Classification](#) and [Section 7: Inspection Requirements](#).
- Thermal Expansion/Contraction
 - When measuring parts, normalized temperature is expected to be 72.0° F (22° C)
 - When normalized temperatures are not available an adjustment of .00037" in/in/°F shall be used for Acrylic dimensions
 - When normalized temperatures are not available an adjustment of .00033" in/in/°F shall be used for Polycarbonate dimensions
- Tolerances if not specified on drawing
 - X.X ±0.125
 - X.XX ±0.06
 - X.XXX ±0.015
 - Angles ±1°

14.1 Profile and Sheet

- Gloves are recommended
- Handling of parts only on non-optical areas
- Verify proper material
- Bow and Warp: must be in one direction not more than .250 in 48" length
- Flash: None allowed, trim all flash.
- Silver streaking: Acceptable in non-optical areas, if not visible at arm's length
- Milkiness: Acceptable if not visible at arm's length
- Flow lines: Acceptable if not visible at arm's length
- Bubbles: Allowed in part, but should not exceed .050" in size and more than 5 per part
- Contamination:
 - Not greater than .050" in diameter and no more than 5 per part if between laminated optical layers (excludes protective film)
 - Black specks should not exceed .050" in diameter and no more than 5 per part
 - No oil or grease allowed
 - Parts may be coated/screened in the next operation
- Burning: Not acceptable
- Gels: allowed in non-optical areas if not seen at arm's length
- Blush: Not acceptable
- Chipping, cracking: Not acceptable
- Minor scratches: 1" long x .020" wide, no more than 3 per part

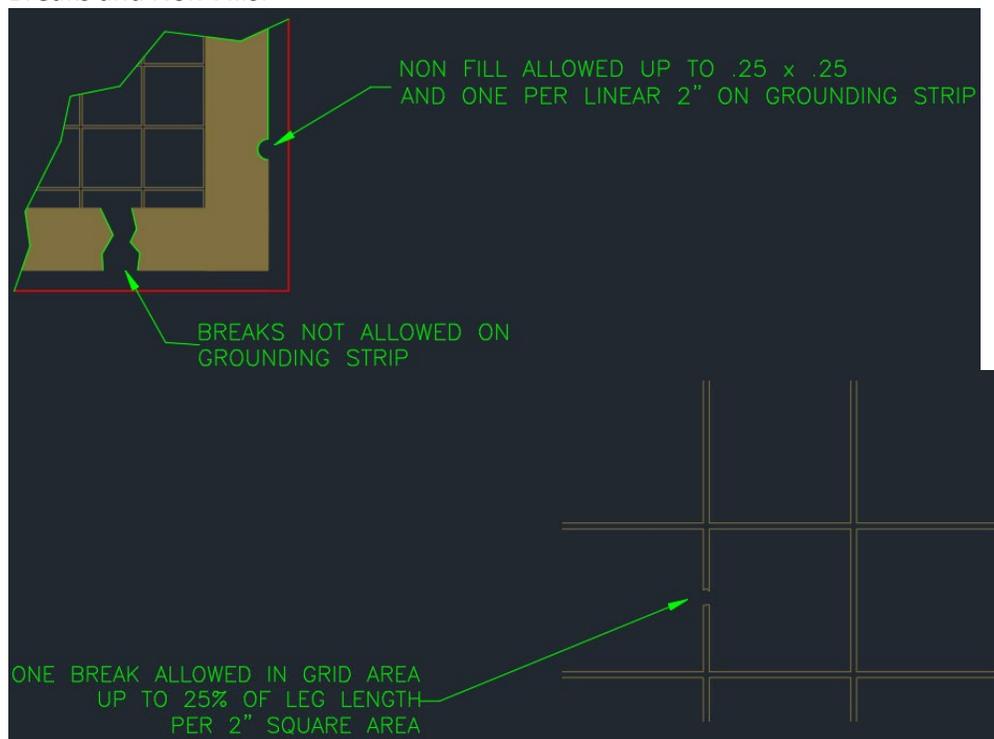
- Unless otherwise noted: Scratches within 0.500 inches of edge of material allowed as they are normally covered by a frame.
- Waviness: boundary samples to be established as necessary

14.2 Sheet textures

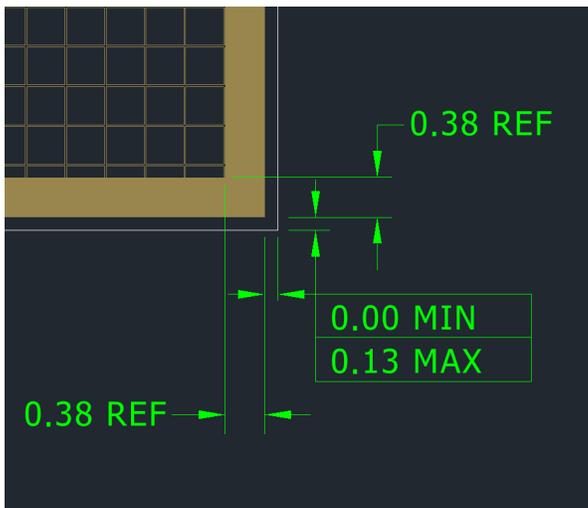
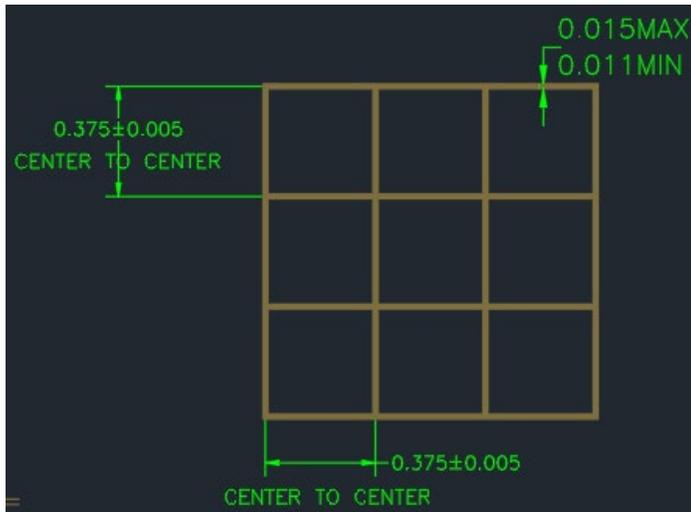
- Crepe texture to be MT 11365 or equivalent
- MTARS texture to be MT 11100 or equivalent

14.3 Screen printed RFI Grid

- RFI (Radio Frequency Interference) Grid Pattern to be Electromagnetic Compliant (EMC) to: MIL-STD-461E, RE102
- Grid pattern shall be silk screened on to textured surface of sheet using DuPont 5021 Silver Conductor, or DaeJoo conductor DS-7466DB or Engineering Approved Equivalent
- Breaks and Non-Fills:



- Grid and grounding strip spacing:



15. Materials

ALP / LexaLite uses the following material classifications for our open stock product offerings, please refer to the material tables for material requirements.

15.1 Acrylics:

LIGHTING - LG

Lighting grade acrylic (RTI 90C) "Acrylic-LG" when the parts require excellent long-term resistance to yellowing f1 rating required. A.L.P. recommends a maximum operational temperature up to 80° Celsius to achieve optimum life. Colors are available per the price list options.

LED

LED grade acrylics have standard UV stabilizer package, which is recommended for use in SSL lighting applications. A.L.P. recommends a maximum operational temperature up to 70° Celsius to achieve optimum life.

EXTRUSION

Extrusion grade acrylics (RTI 90C) “Acrylic-EX” when the parts require excellent long-term resistance to yellowing f1 rating required. A.L.P. recommends a maximum operational temperature up to 80° Celsius to achieve optimum life

GENERIC

This “Generic” acrylic classification indicates that the product is made from a variety of wide-spec acrylic materials and that no UL recognition is available. This wide-spec acrylic material is not recommended for use in high heat or HID applications. Certain products may be offered in wide-spec acrylic to provide the customer with cost savings. This “Generic” classification of materials may vary in color, diffusion, impact modifier amounts, transmittance, impact strength, etc. A.L.P.'s criteria for these variances is wide and A.L.P. shall be the sole judge of whether a material is defective based on these criteria. Material certification is not generally available.

EDGE LIT EL

Edge lit grade acrylics have limited to no additives and minimal edge color and are only recommended for use in edge lit applications. A.L.P. recommends a maximum operational temperature up to 70° Celsius to achieve optimum life.

MOON GLOW™ MG

The Moon Glow designation indicates a customized pigment has been added to the PMMA resin. The appearance of Moon Glow products will be slightly translucent. Using products with a Moon Glow pigment can help to minimize glare and produce a desirable cosmetic effect. A.L.P. recommends a maximum operational temperature up to 80° Celsius to achieve optimum life.

INTERFACE®

This uniquely foamed acrylic material provides diffuse reflection and an extreme white color. A.L.P. recommends a maximum operational temperature up to 80° Celsius to achieve optimum life.

LUMIEO™

The Lumieo designation indicates a customized material has been added to the PMMA resin. The appearance of Lumieo products will be diffuse white. Using products with a Lumieo designation provides high transmittance with improved lamp hiding. A.L.P. recommends a maximum operating temperature up to 80° Celsius to achieve optimum life.

IMPACT

The Impact designation indicates an impact modifier has been compounded into the PMMA resin. The impact modifier is to increase the ability of the acrylic to withstand higher impact loads in specific applications where required. A.L.P. recommends a maximum operating temperature up to 70° Celsius to achieve optimum life. When the parts require excellent long-term resistance to yellowing f1 rating is required.

FROST

Frost AC is ideally suited for applications requiring a softened appearance, without the use of white pigments. Frost AC uses beads within the AC to diffuse light while maintaining high transmittance. A.L.P. recommends a maximum continuous use of 80° Celsius with this material. When the parts require excellent long-term resistance to yellowing f1 rating is required.

Recycled (RAC)

This material is recycled internally with carefully controlled processes and has good clarity, transmittance and color consistency. A.L.P. ISO 9001 quality procedures will determine whether or not material is defective based on these criteria. Recycled Acrylic is an environmentally responsible solution for applications where UL recognition and material certifications are not required, such as post-tops, shades or other accessories.

APPROVED MATERIALS:

ACRYLIC	Part Number	Description
Clear LED Acrylic (AC-FC)		
CA75	102039	
V825-100	102037	
8N-123	114042	
V045-100	114450	
V052-100	114409	
Kurray GH1000S	106324	
H15	114005	
Clear Lighting Grade Acrylic (AC-LG)		
CA75-UVA	102026	
V825-UVA-5A	102010	
Impact (AC-DR)		
HI-IMPACT DR101	234005	100% frost
DR101/V825UVA5A 50/50	114037	50% frost
CA1000-E	234007	
CA-8125	102050	50% impact mod
MI7E	105553	50%+ impact mod
Zk6	234105	
Edgelit (EL)		
Kurray GH1000S	106324	
Plaskolite H12	114040	
Moonglow (MG)		
DR66151/CA75	315182	1 % blend
DR66151/V825-100	315036	1 % blend

DR66151/8N-132	315039	1 % blend
Lumieo (LUM)		
DR66151/CA75	315180	4.5% Blend
DR66151/V825-100	315041	4.5% Blend
DR66151 /8N-123	315181	4.5% Blend
Frost Acrylic (AC-FB)		
V045-68177	232005	
Frost DR Acrylic		
White Acrylic (AC-FW)		
CA75 WT314-1	348656	Used in I43 products
Extrusion Acrylic (AC-EX)		
MS983	102041	
V045	114450	
Interface Acrylic (IAC)		
WHT V920-88847	315066	5% white
WHT V920-88848	N/A	5% white
WHT V920-88849	315068	5% white
WHT V920-88850	N/A	5% white
Black Acrylic		
ACRYL MVN BLACK MA94631203	131887	4%
ACR MVN BLK MA94631203/V825UVA	131892	4%
MI7C 56503	359347	
Recycled Acrylic (RAC)		
AC RAC LUM		
ACRYL CR CA75 (102056 BASE)	315192	4.5% 104705
ACRYL CR V825-100 (102057 BASE)	315193	4.5% 104705

15.2 Polycarbonates:

LIGHTING:

Lighting grade polycarbonates key physical property is resistance to impact. It is virtually unbreakable. A.L.P. recommends a maximum operational temperature up to 90° Celsius to achieve optimum life. Polycarbonate should be used in areas where vandal resistance is a concern. When the parts require excellent long-term resistance to yellowing f1 rating is required. The optical clarity of polycarbonate is degraded by ultraviolet radiation. UvaLex® coating and/or UV guarded lamps are recommended. Colors are available per the price list options.

LED:

LED grade polycarbonates have higher transmittance values as minimal additive packages are used. These grades are for use with sources with little or no UV output, and limited outdoor exposure.

REFLECTOR:

Reflector grade polycarbonates are custom developed for tool surface replication and coating compatibility. These grades contain limited release additives and can be black, white or clear.

FROST:

Frost PC is ideally suited for applications requiring a softened appearance, without the use of white pigments. Frost PC uses beads within the PC to diffuse light while maintaining high transmittance. A.L.P. recommends a maximum continuous use of 80° Celsius with this material. When the parts require excellent long-term resistance to yellowing f1 rating is required.

FIRE RETARDANT GRADE (UL 5VA Rated):

Fire retardant grade polycarbonates have flammability ratings based on UL standards. This grade contains additives that inhibit flammability while maintaining ability to be used in clear lenses or in colored polycarbonates. When the parts require excellent long-term resistance to yellowing f1 rating is required.

APPROVED MATERIALS:

POLYCARBONATE	Part Number	Description
Clear LED Polycarb		
LED2643	117748	
Clear Lighting Grade Polycarb		
AL2647	117736	
303-15 NATC030003	117754	
PL L-1225Z	117715	Teijin
LTG2623	117523	
LEXAN243R	270012	Non metalized only
ET3113	tbd	Extruded/thermoformed
QC-1220UR	117440	Lotte Infino
Color Polycarb		
UV2D-xxxx	multiple	Safety colors
Clear Polycarb Fire Retardant		
FR7087-550657	117750	

Frost Polycarb Fire Retardant		
LUX7432C-WH8F013X	117760	custom use
Frost Polycarb		
M2607-021672	117650	
White Polycarb		
6265X-013677 White Polycarb	282885	
PC-UV3-D	117496	
Black Polycarb		
Black 123-701 Black Polycarb	360694	Custom use

15.3 Silicones:

OPTICAL SILICONE:

This innovative molding material creates lenses that can sustain a 120°C operating temperature, excellent resistance to discoloration and are unbreakable.

APPROVED MATERIALS:

Silicone		
MS-1002	361502	Dow
LR7601-70	362800	Wacker

15.4 Sheet Molded Compound:

NON-ENCLOSURE (HB Rated):

This material, also referred to as SMC/BMC, is a fiberglass reinforced polyester sheet compound that is compression molded.

ENCLOSURE (5V Rated):

This material also referred to as SMC/BMC, is a self-extinguishing fiberglass reinforced polyester sheet compound that is compression molded.

APPROVED MATERIALS:

Sheet Molded Compound		
MPD HB SMC	SMC M203	Interplastics MFG
MPD HB SMC	SMC U028221	Interplastic MFG
MPD 5V SMC	SMC 1026221	Interplastics MFG

15.5 Die Cast Aluminum

A.L.P. uses A380 in the manufacturing of Die cast products

15.6 Light Control Film

LCF Sheet Type Code	ALP Description	Label	Color	Gauge	ALP Part # for Sheets
FAW	S82 DW020	Flexilume	White	0.02	821768-P
FIAL	S84 DW020	Lumieo	Lumieo	0.02	834495-P
RIAL	S84 AW080	Lumieo	Lumieo	0.08	834012-P

15.4 Eggcrate louvers:

Polystyrene:

As listed or engineering approved equivalent

APPROVED MATERIALS:

Polystyrene		
Polystyrene	HH0400/ GP0900	Plastic Solutions

15.4 E&G Latches and Traylats:

Acetal:

As listed or engineering approved equivalent

Polycarbonate:

As listed or engineering approved equivalent

APPROVED MATERIALS:

Polycarb/Acetal		
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6265X-013677	282885	Covestro

15.4 E&G Lanyard:

APPROVED MATERIALS:

Nylon		
Vydyne 21SPF	370040	Formerra