

Class 1 Acrylic Panel Manufacturing Specifications

1) Design:

- i. The minimum compression design safety factor for bonded panels shall be 8. Per ASME-PVHO-1
- ii. The minimum tension and flexure design safety factor for bonded panels shall be 11.2. Per ASME-PVHO-1

2) Material:

- i. Cell cast acrylic sheets either laminated or block produced from commercial grade polymethyl methacrylate.
- ii. The cell casting process shall produce material with the typical physical properties found in attachment B.1005.
- iii. Acrylic sheets will have a flame spread of 200 or less (class III) as detailed in ASTM E-84.

3) Optical Appearance:

- i. The clear sheet must be almost completely colorless when viewed from the dry and wet viewing side.
- ii. Sheet edge color is normal and considered acceptable.
- iii. A panel's optical quality will be considered acceptable if it conforms to the following criteria.
- iv. Light transmittance more than 90% in .120" clear acrylic
- v. Haze less than .6% in .120" clear acrylic.
- vi. When perpendicularly (90 degrees) viewing the dry side surface of a flat panel at distance of 24" (609mm) with an illuminated grid board consisting of 1"x1" squares located at a distance of 36" (915mm) from the wet side, the panel's surface shall be polished and appear smooth without noticeable irregularities. The maximum visible distortion as measured against the grid board shall not exceed .25" (6mm) beyond a grid square.
- vii. When perpendicularly (90 degrees) viewing the wet side surface of a flat or curved panel at distance of 24" (609mm) with an illuminated grid board consisting of 1"x1" squares located at a distance of 36" (915mm) from the dry side, the panel's surface shall be polished and appear smooth without noticeable irregularities. The maximum visible distortion as measured against the grid board shall not exceed .5" (12.7mm) beyond a grid square.
- viii. Scratches, crazing, and gouges that only spoil the optical performance of the panel are permitted inside the rebate.

4) Casting & Lamination Inclusions:

- i. Casting and lamination inclusions can take the form of an air bubble, hair, rubber, sand, paper, paint, dirt, or other non-acrylic substance.
- ii. Inclusions in the viewing area > 0.125" DIA or length will be limited to, one per 2 sq. yds. of viewing surface or 5 per cubic meter of viewing area whichever is greater.
- iii. Inclusions inside the viewing area <= 0.125" DIA or length will be ineligible for the consideration.
- iv. Inclusions inside the viewing area > 0.5" DIA or length is considered unacceptable.
- v. Inclusions inside the rebate area shall not be considered unless their presence will impact the panel's structural performance.
- vi. Localized routing out and recasting of inclusions is acceptable, provided it satisfies the optical and structural requirements as described in section 2&3.
- vii. Inclusions discovered by the client after panel installment and delivery will be repaired at the client's expense.

5) Dimensional Tolerance, Planarity, & Edges:

- i. Thickness tolerance Measured at 70°F (21°C).

| Material Thickness | | Tolerance ± | |
|--------------------|---------|-------------|------|
| Inches | mm | Inches | mm |
| 0-1 | 0-25 | 0.24 | 6.1 |
| 1-2 | 25-51 | 0.24 | 6.1 |
| 2-4 | 51-101 | 0.35 | 8.9 |
| 4-6 | 101-152 | 0.35 | 8.9 |
| 6-8 | 152-203 | 0.35 | 8.9 |
| 8-12 | 203-304 | 0.50 | 12.7 |
| 12-18 | 304-457 | 0.50 | 12.7 |
| 18-24 | 457-609 | 0.50 | 12.7 |
| 24-30 | 609-762 | 0.50 | 12.7 |

- ii. Dimensional tolerance: In order reduce installation problems the panels shall meet the following dimensional tolerances. Tolerance at 70°F (20°C) = $.00004 \times 30 \times L$ or .25" whichever is greater. This table should be used as a reference guide only. Measured at 70°F (20°C).

| Dimension | | Tolerance ± | |
|-----------|-------|-------------|------|
| Inches | mm | Inches | mm |
| 100 | 2540 | 0.25 | 6.4 |
| 140 | 3556 | 0.25 | 6.4 |
| 160 | 4064 | 0.25 | 6.4 |
| 200 | 5080 | 0.25 | 6.4 |
| 300 | 7620 | 0.36 | 9.1 |
| 400 | 10160 | 0.48 | 12.2 |
| 500 | 12700 | 0.60 | 15.2 |
| 600 | 15240 | 0.72 | 18.3 |
| 700 | 17780 | 0.84 | 21.3 |
| 800 | 20320 | 0.96 | 24.4 |
| 900 | 22860 | 1.08 | 27.4 |
| 1000 | 25400 | 1.20 | 30.5 |

Quote number:

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- iii. Planarity "Surface Flatness": Surface flatness tolerance = $0.003 * L$. Where "L" is the longest length of the acrylic sheet.
- iv. Rebate concealed edges: In order to minimize the possibility of damage to the sheet during transport, edges shall have a 45 degree chamfer with a minimum of 0.12"(3mm) and a maximum of 1.0" (25.4mm)
- v. Curvature tolerance: Curvature radius = $3 .004R$ inches from specified value measured
- vi. Bonding angles: 32 degrees from specified value measured at a maximum of 24" from bond location.

6) Bonding Specification - Large or complex shapes will require smaller panels to be chemically joined together.

- i. Location of bond joints will be specified to client upon request.
- ii. The minimum compression design safety factor for bonded panels shall be 8. Per ASMEPVHO-1
- iii. The minimum tension and flexure design safety factor for bonded panels shall be 11.2. Per ASME-PVHO-1
- iv. Casting inclusions can take the form of an air bubble, hair, rubber, sand, paper, paint, dirt, or other non-acrylic substance.
- v. Inclusions outside the visible bond area will not be considered unless their presence will significantly impact the panel's structural performance.
- vi. Inclusions inside the bonded visible area $\leq .125$ " will not be considered.
- vii. Inclusions inside the visible area > 0.125 " but less than .5" in length shall be limited to no more than one per linear yard of bond. Bond length shall be calculated by combining the length of all bonds in that particular panel.
- viii. Inclusions inside the visible bond area $> .5$ " in overall length are unacceptable. These inclusions will either be routed out or the bond recast at the sole discretion of Innovative Acrylics llc.
- ix. Bond inclusions discovered by the client after panel installment and delivery will be repaired at the client's expense.

Innovative Acrylics llc.
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