

Automotive Interior Material (AIM) Testing



Overview

AIM boxes are under-glass enclosures that reproduce the sunlight and extreme heat found inside an automobile. These harmful environmental stressors result in color change, cracking, peeling, oxidation, or loss of strength of materials in car and truck interiors.

Features

AIM box testing can accelerate these stressors. While Type F1 AIM boxes are static, Type F2 AIM boxes perform precision azimuth tracking, that allows specimens to follow the sun throughout the day. **TRUE** (Tracking, Reflecting, Ultra-Exposure) AIM boxes feature dual-axis (azimuth and elevation) solar tracking, and a set of reflecting mirrors for enhanced solar exposure. Specimens in TRUE-AIM boxes receive ~120% more radiation than single-axis azimuth tracking alone, to achieve results faster.

All AIM boxes are suitable for mounting large components like instrument panels, seat cushions, and steering wheels. Small, flat specimens, such as interior trim materials, can also be exposed.

| | AIM | AIM | TRUE-AIM |
|--|--|--------------|--------------|
| Test Location (per GMW 3417) | L2 (Florida) | L1 (Arizona) | L1 (Arizona) |
| Test Fixture Type (per GMW 3417) - see figures below | F1 | F2 | F3 |
| Elevation Angle (Tilt) | 45° | 51° | Tracking |
| Azimuth Solar Tracking | — | ● | ● |
| Dual Mirrors for Enhanced (~2x) Solar Exposure | — | — | ● |
| Irradiance Uniformity (+/- from mean) | 2% | 2% | 5% |
| Under Glass (G1 - Tempered or G2 - Laminated) | ● | ● | ● |
| High Temperature Limited, Black Panel Control | ● | ● | ● |
| Temperature Uniformity (+/- from mean) | 4 °C | 4 °C | 10 °C |
| Standard Temperature Set Points | T1, T5, T6 (uncontrolled, 102 °C, 110 °C) | | |
| Additional Temperature Set Points | T2, T3, T4 (77 °C, 85 °C, 93 °C) | | — |
| Maximum Exposure Dimensions | 53 × 144.7 cm (21 × 57 in) | | |
| Maximum Exposure Area | 7723 cm ² (1197 in ²) | | |

AIM Box Options

AIM Boxes are available in three different types, as shown below.



Type F1 (Florida) - fixed elevation and azimuth



Type F2 (Arizona) - fixed elevation, tracking azimuth



Type F3 (Arizona) - dual axis tracking (elevation and azimuth), and dual mirrors

AIM Box Test Standards

AIM box testing from Q-Lab meets a variety of automotive industry test methods, including:

- GM 2617M, 3619M (withdrawn), 7454M (withdrawn), 7455M, 9538P
- GMW 3417, 14444, 16717
- Ford DVM 0020
- ASTM G201

Clear tempered (G1) or laminated (G2) glass can be specified in order to meet the requirements of test standards.

Q-Lab conducts all exposure tests and evaluations in accordance with appropriate test methods from ASTM, ISO, BSI, DIN, JIS, SAE, and other recognized organizations, in accordance with ISO 17025.

Typical Test Durations by Part Type

| Automotive Part Description | Temp (° C) | TNR (Langleys) | Typical F2 Time (Months) | Typical F3 Time (Months) |
|--|------------|----------------|--------------------------|--------------------------|
| Instrument Panel (Upper Horizontal Surface) | 102 | 100,000 | 6 to 7 | 3 to 3.5 |
| Instrument Panel (Lower, Above Door Glass Line) | 85 | 30,000 | 3 to 4 | — |
| Trim Panel: Door/Quarter (Door Glass Line and Armrest) | 85 | 50,000 | 5 to 6 | — |
| Trim Panel: Door/Quarter (Lower; Vertical Surface) | 85 | 5,000 | < 1 | — |
| Garnish Moldings (Pillar; Horizontal Surface) | 93 | 75,000 | 7 to 8 | 3.5 to 4 |
| Garnish Moldings (Pillar; Vertical Surface) | 85 | 50,000 | 5 to 6 | — |
| Garnish Moldings (Pillar; Above Door Glass Line, Vertical) | 85 | 40,000 | 4 to 5 | — |
| Garnish Moldings (Pillar; Below Door Glass Line, Vertical) | 85 | 5,000 | < 1 | — |
| Seats/Head-Restraint (Rear Seat) | 102 | 105,000 | 7 to 8 | 3.5 to 4 |
| Seats/Head-Restraint (Front Seat) | 93 | 40,000 | 4 to 5 | 2 to 2.5 |
| Steering Wheel/Column Trim (Rim Upper Surface) | 93 | 55,000 | 5 to 6 | 2.5 to 3 |
| Steering Wheel/Column Trim (Horn Pad, Column & Shroud) | 85 | 15,000 | ~2 | — |
| Consoles, Top | 93 | 30,000 | 3 to 4 | 1.5 to 2 |
| Consoles, Sides | 85 | 10,000 | 1 to 2 | — |
| Assist Handles and Overhead System Components | 85 | 10,000 | 1 to 2 | — |
| Rear Window Trim Panel | 102 | 105,000 | 7 to 8 | 3.5 to 4 |
| Open Rear Cargo Area, Vertical Glass, Components (At Sidewall) | 93 | 50,000 | 5 to 6 | 2.5 to 3 |
| Open Rear Cargo Area, Vertical Glass, Components (Floor Level) | 85 | 15,000 | ~ 2 | — |



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