mga research corporation

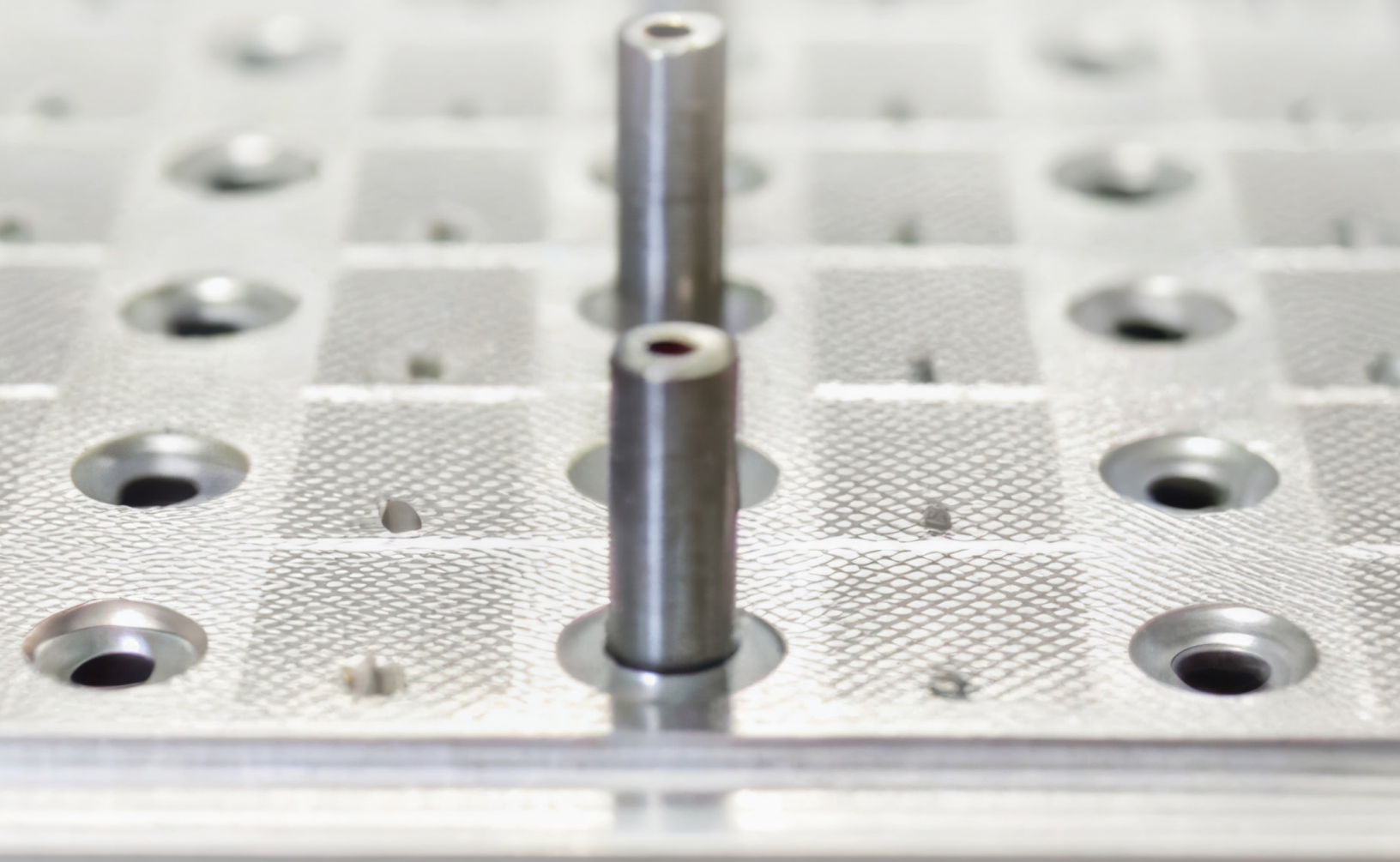
FIXTURE FABRICATION

TRUST MGA FOR A SEAMLESS AND EFFICIENT FIXTURE SOLUTION.

www.mgaresearch.com/fabrication-fixtures

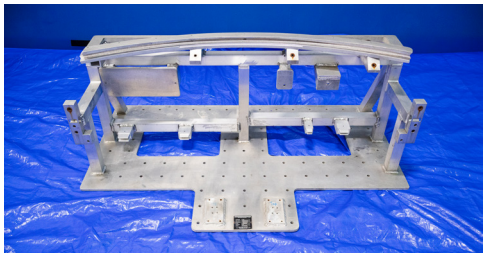
WHAT IS THE PURPOSE OF A TESTING FIXTURE?

Fixtures are engineered interfaces that replicate real-world mounting conditions and boundary constraints. Whether it's straightforward bolt-on locations or complex geometries that support part surfaces, MGA's fixture expertise is built on practical testing experience, not just CAD theory. Test fixtures are a crucial part of proper test execution. The fixture simulates the attachment points of the test article to the vehicle, battery, etc. Having an accurate and well-designed fixture better simulates what the component will see in the real world. The team at MGA ensures that every fixture is built to the highest standards and quality to ensure repeatability, usability, and test robustness.



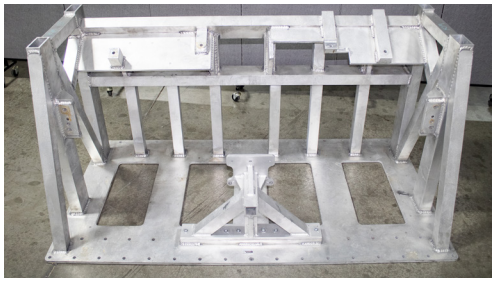
MGA FIXTURES

Vibration/MAST Fixtures



Built to be as rigid as possible to move resonance frequencies outside of testing frequency range.

Holding Fixture

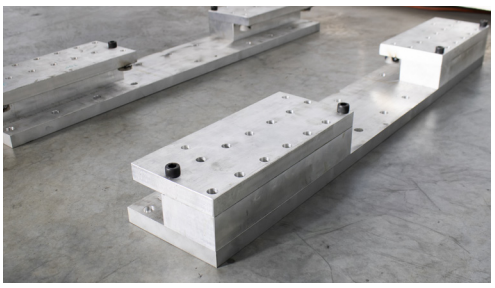


Designed to be as cost-effective as possible while maintaining the minimum amount of required fixation points or features.

Shipping/Storage Fixture

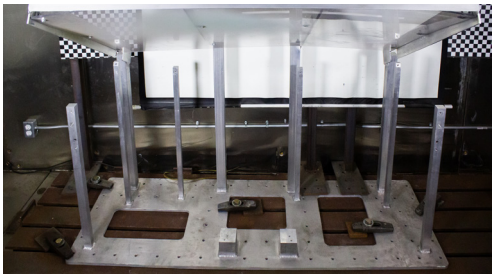
Whether a compact storage tote or freight shipping rack, these fixtures are designed to hold parts in unique orientations with support to prevent deformation or damage during transportation.

Battery Holding Fixture



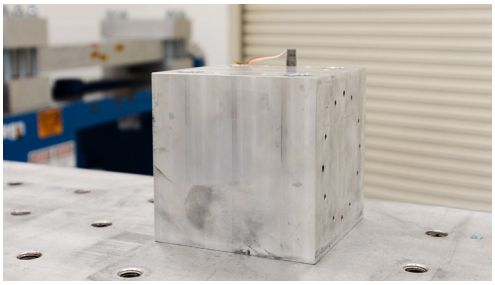
Designed to securely restrain batteries during vibration and impact testing, ensuring accurate results and consistent safety performance.

Airbag Deployment Fixture



Depending on test sample (seat, curtain, or IP airbags) these fixtures are designed to include surrounding environments that affect airbag performance: windshield, center console, or seat cushion.

Pyroshock Fixture



Developed to minimize weight and the magnitude of resonance frequencies, while still providing sufficient rigidity and strength to support test articles undergoing severe shock levels. Includes built-in accelerometer mounting locations to measure the shock response throughout the fixture and UUT.

Sled Fixture

Dynamic sled test fixtures often include rigid designs with added elements to replicate surrounding environments. For example, seat fixtures may include fixturing for luggage retention, knee blockers, or D-ring mounting depending on the test.

Pitch & Roll Fixture

Robust I-beam structure engineered to deliver up to 10.5° rotation in both axes, support FAA-specified loadcells and seat tracks, and withstand dynamic testing for 14 CFR Parts 23, 25, 27, and 29.

Quality Check (H-Point) Fixture

Highly precise fixtures used to verify part geometry after production. Common methods include pins, calipers, dial indicators, and Go/No-Go gauges to verify hole and gap tolerances.

Collaborative Design Grounded in Real Testing Needs

At MGA, fixture design is more than just CAD — it's a collaborative process rooted in decades of testing experience. Whether starting from a napkin sketch or a full 3D model, we work together with customers to bring reliable, test-ready fixtures to life.

Standalone Design Services

In addition to turnkey fixtures, we also offer design-only support. If you have in-house or preferred fabrication resources, our team can provide detailed 3D models, FEA simulations, and 2D documentation to guide your build. We're flexible — our goal is to support your testing needs, whether we build the fixture or not.

01 CONCEPT

We begin with your sketch, CAD file, or just an idea and collaborate to define how the fixture should function within the test environment.

02 CAD MODELING

Our designers create detailed 3D models that capture the fixture's full geometry, mounting points, and design intent.

03 FEA SIMULATION

We perform finite element analysis to confirm the fixture meets customer requirements.

04 BOM & LAYOUT DRAWINGS

We generate a complete bill of materials along with layout and ballooned 2D drawings to guide fabrication.

05 FABRICATION & MACHINING

Fixtures are manufactured using steel, aluminum, or 3D-printed components.

06 CMM VALIDATION

Fixtures are validated using CMM arms and 3D scanning to verify all fixation points and features are within customer-specified tolerances.

> ***Global Capabilities: MGA Mexico***
> *We are proud to offer our fixture design services at our new facility in Querétaro, Mexico. Engineers will closely collaborate with clients to create fixtures that meet testing and production requirements.*

Fabrication

Once a design is approved, our in-house fabrication team executes with speed and precision. We work with a wide range of materials and offer both traditional fabrication and additive manufacturing options to support complex fixture needs. As our customer requirements evolve, we continue to expand our capabilities by investing in equipment and processes to take on increasingly challenging requests.

CNC MACHINING: 3-axis and 5-axis machining for complex parts.
LATHE & MILLS: Precision turning and milling for various materials.
WELDING: Expertise in welding both steel and aluminum for durable constructions.
WATERJET CUTTING: High-precision waterjet technology for versatile material cutting.

Capabilities

Aluminum & steel welding

General fabrication

Precision machining

Nylon 3D printing

Paint & surface finishing

Validation

We validate every fixture to ensure precise positional accuracy of fixation points in the X, Y, and Z coordinate directions. For surface areas and contours, we utilize 3D scanning and overlay comparisons against CAD data to confirm fit and form. Our standard tolerance for fixation point accuracy is ±1mm, and we remain flexible in meeting special validation requirements as needed.

On-Site Fixture Validation
MGA also offers on-site fixture validation services for non-MGA fixtures. Whether you need revalidation or verification of existing tooling we can deploy our metrology-grade equipment & personnel to your location.

About MGA

At MGA Research Corporation, we're more than just a world leader in testing services—we're your dedicated partner in ensuring the highest quality for your products. Our labs serve as a comprehensive hub where we meticulously evaluate any aspect of your product, from the raw material to the final assembly. With over 45 years of diverse testing experience in safety, durability, and material performance, we bring a wealth of expertise to address your unique challenges. We are here to offer tailored technical solutions that meet your specific needs.

MGA FABRICATION FACILITIES

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**Future fixture capabilities available soon.*

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