Materials Testing

Comprehensive material testing services for the automotive industry.

www.mgaresearch.com/capabilities/materials

Testing Capabilities

Our select facilities offer customers a large array of materials testing options. These include solutions to evaluate painted parts, foam products, fabrics, threads, and plastic components.

Emissions

- Odor (bag and jar method)
- Fogging (photometric and gravimetric)
- Direct thermal desportion
- Tedlar bag component level
- VOC testing
- Amine emissions
- Formaldehyde release
- Carbonyl offgassing

NEW! VOC Capabilities

VOC (Volatile Organic Compound) testing plays a key role in the evaluation of materials that are used in an automobile. This type of test measures the presence and levels of compounds in interior components such as seats, instrument panels, etc. The results then indicate whether the materials used in these components will compromise the air quality inside the passenger compartment. MGA is excited to offer this service to the industry in the near future.

Impact Testing/Hardness

- Charpy (notched and unnotched)
- Izod (notched and unnotched)
- Gardner impact
- Falling ball impact
- DuPont impact
- Soft panel indentation hardness
- Shore A/D/OO durometer
- Vickers microhardness

Coating Performance

- Cross cut adhesion
- Pencil hardness
- Condensing humidity
- Stone impact
- Shear scratch resistance
- Pressure washer resistance
- Paint/coating film thickness (wedge cut or micrographic evaluation)

Scratch & Mar

- Cross grid scratch and mar
- Five finger scratch and mar
- Erichsen scratch pen and tester
- Counterbalance scratch and mar
- Nissan scratch

Surface Abrasion

- Washability
- Nissan abrasion
- Linear abrasion
- Reciprocating abrasion
- Taber rotary abrasion
- Scuffing
- Hex bar abrasion
- Windshield wiper abrasion
- Martindale abrasion and pilling

Physical Properties

- Specific gravity
- Melt flow index
- HDT/Vicat softening
- FTIR
- Horizontal flammability
- Vertical flammability
- Vickers microhardness
- Ash content/glass fiber content
- Water absorption
- Moisture content

UTM Testing

- Tensile
- Peel strength
- Weld strength
- Seam strength
- Lap shear
- Tear strength
- Compression (IFD, hysteresis, compression set)
- Flexural (3 or 4 point bend)

MGA offers testing capabilities up to 150kN for physical testing (non-hydraulic). Specimen preparation is often done at MGA using the provided raw material or component.

The Core of Material Performance in Validation

Tensile Testing

Flexural and tensile testing is a fundamental mechanical test that plays a critical role in evaluating the strength and ductility of materials. It involves stretching a material until failure, providing the manufacturer with crucial data such as ultimate strength, yield strength, elongation, compression, and Young's modulus. These values are essential for ensuring that materials can withstand loads and stresses that they will encounter in real world applications. By understanding how a materials behave under stress, designers can make informed decisions about material selection, safety margins, and product performance. Ultimately, flexural and tensile testing helps prevent structural failures, ensures compliance with quality standards, and contributes to the overall reliability and durability of the product.

Fabric/Vinyl Testing

- Fabric stiffness
- Bally flexometer
- Cold cracking
- Pinch fold
- Elmendorf tear strength
- Static and permanent elongation
- Air permeability

Colorfastness

- Soiling and cleanability
- Colorfastness to burnt gas fumes
- Wyzenbeek
- Gakushkin
- Crocking
- Chemical resistance

Evaluation Methods

- 20°/60°/85° gloss evaluations
- Luminance
- Haze/transmittance
- D/8°, multi angle, and 45° geometry CIELab color evaluations
- AATCC grey scale
- D65 light booth

Environmental Simulation

- Carbon arc weatherometer
- Xenon arc irradiation
- Reach in chambers
- Salt spray
- Cyclic corrosion
- Thermal cycling

Environmental Chamber Capabilities

MGA utilizes reach in chambers to simulate material performance in various climatic settings. Through environmental exposure materials are tested for changes in dimensional stability, color, haptic feedback and flexibility. Our chambers can accommodate any cyclic profile as needed.

Temperature chambers range from -40°C to 150°C. and 20-95% humidity. Oven temperatures up to 300°C.

Reach-in Chamber

Xenon Chamber

Corrosion Chamber

Equipment Capabilities

Physical Properties

- Thermo Nicolet iS10 FTIR with diamond ATR (Polymers FTIR Spectral Library Search, solid samples only)
- SDL Atlas Horizontal Flammability Chamber (automatic timer, pneumatic gas control)
- Deatak FAA Multi-Purposed Flammability Tester Model MP-1.5
- Testex FX3300 Air permeability tester (test pressure :10-2,500 Pa, max sample thickness : 10mm)

Impact Testing/Hardness

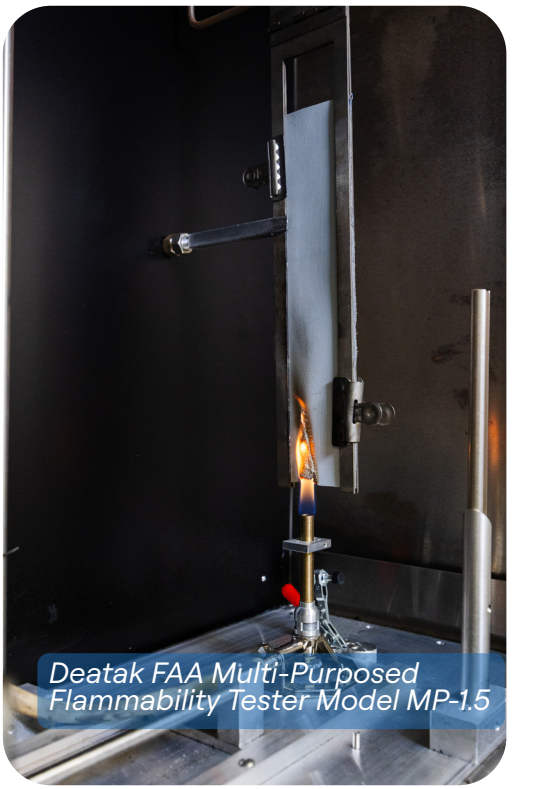
- Tinius Olsen Charpy/Izod Impact Tester (unnotched or type A notch)
- Toyoseiki DuPont Impact Tester (300, 500, or 1000g weight options | 1.59, 3.18, 4.76, 6.35, or 12.7mm diameter impact heads)
- Shimadzu HMV-2 Microvickers hardness tester (Loading range : 9.807mN – 1.61N)

Surface Abrasion

- Elcometer 1720 Abrasion and washability tester (10-65 cycles/minute, 10-300mm stroke length, controlled liquid output for wet abrasion)
- Taber 5750 Linear abrader (Regular and heavy duty, 5-100mm stroke length, 2-75 cycles/minute, max 2100 gram load)
- Taber 5900 Reciprocating abrader (6-155mm stroke length, 3-75 cycles/minute, up to 24N load)
- Taber 1750 Dual head Rotary Abrader (optional scuffing attachment)
- BYK Washability Tester (includes windshield wiper attachment)
- James Heal Martindale (both abrasion and pilling options)

Vertical Flammability

Our flame chamber is compliant to FAR 25.853 for testing insulation and rigid panels in aerospace vehicles. Accommodations can be made for 45° testing for fabrics and flexible materials as well.



Deatak FAA Multi-Purposed Flammability Tester Model MP-1.5

Taber 5750 Linear Abrader

Colorfastness

- SDL Atlas Electronic crockmeter (100mm stroke length, standard 9N load)
- Schap Wyzenbeek Oscillatory Tester
- Gakushkin Colorfastness Tester (100mm stroke length, 200 or 500g load, 30-60 cycles per minute, flat or curved sample platform)
- Colorfasntess to burnt gas fume chamber

Fabric/Vinyl

- Taber V-5 Stiffness tester
- Schap Bally Flexometer
- Schap Pinch Fold Tester (ambient and cold capable performance)
- TMI Elmendorf Tear Strength Tester

Coating Performance

- Q-Lab Wet Bottom Cleveland Condensation Cabinet (up to 70°C, 100%RH | Maximum test quantity : 62 plaques)
- Gravelometer (45-90° impact angle, maximum 160 psi spray pressure)
- Keyence VHX-6000 Digital Microscope (up to 7000x magnification | Automatic layer identification and measurement for coatings)

Cross Hatch for Surface Adhesion

Scratch and Mar

- Erichsen 430P II scratch and mar tester (two ② test speeds : 40mm/s or 1000mm/min)
- Taber five finger scratch and mar tester (200mm stroke length | 1.0mm scratch and 7.0mm mar tips | 2, 3, 4.5, 5, 6, 7, 10, 15, and 20N loads)
- Erichsen SmartPen (Maximum 20N load)
- Erichsen pen scratch (Maximum 20N load)

Environmental Simulation

- Carbon Arc Sunshine Weatherometer
- Q-Lab Xenon Arc Units (Rotating rack and stationary | 340nm, 420nm or 300-400nm)
- Q-Lab Cyclic corrosion chamber (neutral salt solution only)
- Reach in chambers (-40°C to 150°C / 20-95%RH for climatic, up to 300°C for small oven testing)

Solar Simulation at MGA

MGA provides Solar Simulation services for a variety of products. With the use of an environmental chamber equipped with an Atlas Solar Array, assemblies as large as SUV front/rear fascia can be evaluated. The chamber can control, with irradiance, from -20°C to 100°C and 20-80% relative humidity. This control allows for accurate day/night cycle simulations as well as a multitude of different climates. Four 4000W MHG bulbs provide a field of irradiance capable of testing assembly-level parts. An adjustable irradiance output of 800-1200 W/m2 allows us to meet a variety of test standards as well as custom profiles.

The MGA Advantage

A core part of the services provided by MGA involve the testing of interior and exterior automotive materials to determine both their physical and aesthetic properties. MGA has had a devoted materials team since 2004 and our testing capabilities are constantly growing.

Boasting six A2LA-accredited laboratories and expertise across a multitude of unique specifications, MGA offers significant benefits to its clients.

- Comprehensive testing capabilities with a wide range of testing services across multiple material specifications
- State-of-the-art facilities featuring advanced laboratories equipped with cutting-edge technology
- Expertise and Experience backed by years of industry experience knowledge
- Customized testing solutions offering flexible testing programs to meet specific project requirements
- Accredited and certified labs maintain various industry accreditations and certifications ensuring accuracy and quality of testing
- Fast turnaround times with efficient processes and multiple labs helping customers meet tight deadlines.
- Proven Track Record for delivering reliable and consistent testing results, making it a trusted partner for materials testing needs.

mga research corporation

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 nearly 50 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.

Get in touch

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