



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

RELIABLE ANALYSIS, INC.¹
32201 N. Avis Drive
Madison Heights, MI 48071
Alec Lang Phone: 248 588 9770

MECHANICAL

Valid To: May 31, 2023

Certificate Number: 0386.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory, *as well as the satellite laboratory listed below*, to perform the following tests on adhesives, coatings (paints), deadeners, elastomers, foams, foundation board, metal, moldings, automotive paperboard, plastics, rubber, sealers, tapes, automotive textiles, body components, and assemblies:

Test:

Test Standard(s):

Abrasion

Abrex

BMW: AA P 296; AA-0471; GS97034-1;
Ford: FLTM BN 155-01

Crocking

AATCC 8;
FLTM BN 107-01; FLTM BN 107-02;
SAE J861

Crock/Mar

LP-463PB-54-01

Martindale

FLTM BN 158-01;
GMW15651;
DIN EN ISO 12947-1;
ISO 12947-2, -3, -4;
VDA 230-210

Snagging

SAE J948

Taber

ASTM D3884; ASTM D4060;
FLTM BN 108-02;
GM9337P²;
GMW3208;
SAE J948

Veslic

ISO 11640

Wyzenbeek

LP-463KB-06-01;
LP-463KC-04-02 (Procedures 1 & 2)

Chemical Wear

LP-463KC-22-01;
SAE J948

<u>Test:</u>	<u>Test Standard(s):</u>
Abrasion (cont'd) Fiber Loss after Abrasion	SAE J1530
Adhesion Paint/Tape	ASTM D3359; LP-463LB-19-01; FLTM BI 106-01; GM9160P ² ; GMW14829
Saw Grind	ASTM B571 (section 8)
Air Permeability	ASTM D737; ISO 7231 (Method A)
Appearance Color	ASTM D2244; SAE J1545
Gloss	ASTM D523
Grain Retention	GM9142P ²
Bending/Flex/Mandrel Cantilever/Textile	GM9664P ² ; GMW3390
Chemical Stress	FLTM BO 127-03; GMW15790; ISO-22088-3
Ductility	ASTM B490
Mandrel/Brittleness	GMW16746
Mandrel/Cold Flex	LP-463LB-11-01; SAE J323-A
Chemical Resistance & Colorfastness Acid Spotting	LP-463-KC-16-01
Amine Resistance	GMW14131; VDA 230-223

<u>Test:</u>	<u>Test Standard(s):</u>
Chemical Resistance & Colorfastness (cont'd)	
Automotive Fluids	GM9509P ² ; GMW14334; LP-463PB-31-01
Cure	GMW15891
Chemical Staining	LP-463PB-57-03; FLTM AN 101-01
Fuel	FLTM BO 101-05; GMW14333
Oil Repellency	AATCC 118
Perspiration	AATCC 15; FLTM BI 113-07; FLTM BI 113-06; GMW14296; GMW14334; ISO 105-E04; LP-463KC-21-01
Spotting: Water	AATCC 104; LP-463KC-03-01; GMW14102
Water & Soap	FLTM BI 113-01
Salt Stain	GM9133P ²
Suntan/Insect Repellent	Ford DVM0036; Ford DVM0039; FLTM BI 113-08; GMW14445
Coefficient of Linear Thermal	ASTM E831
Expansion by TMA	ISO 11359-1, -2
Coating Thickness/Composition	
Coulometric	ASTM B504; ISO 2177
Microscope	ASTM B487; GMW15726; ISO 1463
S.T.E.P. Test	ASTM B764
Compatibility	
Water Colorfastness	AATCC 107
Color Trans Thread	GM9137P ²

Test:

Test Standard(s):

Compatibility (cont'd)

Vinyl Leather

GM9141P²

Migration Staining/Dye Transfer

AATCC 163;
ASTM D925;
LP-463DD-06-01;
FLTM BN 103-01;
GMW14141;
ISO 15701;
ISO 26082-1

Compression/Foam

Compression Set

ASTM D3574-D;
FLTM BN 115-07;
ISO 815-1 (Type A); ISO 1856

Resilience (Ball Rebound) Test

ASTM D3574-H

Dynamic Fatigue Test by Constant
Force Pounding

ASTM D3574-I³;
ISO 3385

Load Deflection

ASTM D1056 (sections 16-21);
ASTM D3574 (B₁, C, N);
ISO 2439; ISO 3386

Corrosion/Salt Spray

CASS

ASTM B368;
FLTM BQ 105-01;
GMW14458

Creep Back

GMW15282

Salt Spray

ASTM B117;
FLTM BI 103-01;
GMW3286;
GMW14872;
SAE J2334

Density/Weight

Mass

ASTM D3574-A;
FLTM BN 106-01;

ASTM D751 (section 10);
ASTM D3776-C;
ISO 9073-1;
SAE J860;
GMW3182

Test:

Test Standard(s):

Density/Weight (cont'd)

Thickness

ASTM D751 (section 9);
SAE J882

Specific Gravity

ASTM D792 (Method A);
ISO 1183-1 (Method A)

Water Absorption

ASTM D570;
ASTM D1056 (sections 43-49)

Water Repellency

GM9317P²;
GMW4726

Dimensional/Measuring/Shrinkage

Fabrics

Length

ASTM D751 (sections 7.1 and 8);

Width

ASTM D3773-A;

Fabric Count

ASTM D3774;

ASTM D3775

Measurements

FLTM BN 105-01; FLTM BN 105-03;
FLTM BO 129-01;
GM9230P;
GM9330P² (08/15, replaced by GMW4089);
GMW4089;
GMW4217;
GMW14773;
ISO 1923; ISO 2577;
SAE J883

Stretch & Set

ASTM D751 (sections 85-88);
GMW3211;
SAE J855

Emissions

Aldehydes and Ketones

FLTM BZ 156-01 (Parts A & B);
VDA 275;
PV 3925;
EN 717-3;
GMW15635;
STD 429-0002;
ISO 17226-2;
DIN EN ISO 14184-1;
STJLR.51.5232

Total VOC

FLTM BZ 157-01;
GMW8081²;
PV 3341;
VDA 277;
TS-INT-002;
STD 429-0003; STJLR.51.5229

Test:**Test Standard(s):****Emissions (cont'd)**

VOC/SVOC/FOG

VDA 278;
GMW15634Sampling Bag Method for Measuring
VOC from Vehicle Interior
CompartmentISO 12219-2;
ISO 16000-3;
ISO 16000-6;
NES M0402; Ford 01.12.L-10661; MS-300-55;
MS-300-57; 0094Z-T7S-0000; FLTM BZ-108-01;
MES CF 080F; TSM0508GMicro-Scale Chamber for Determining
VOC EmissionsISO 12219-3; ISO 16000-3; ISO 16000-6;
FCA CS-13398; FLTM BZ 151-01Organotin,
Soluble Mineral
Tanning Agents
& Heavy MetalsWSS M99P2222D1 (section 3.3);
ISO 17353;
ASTM E1479

Failure Analysis

AMS Volume 11

FlammabilityDBL 5307; DIN75-200;
EDS-T-7602² (replaced by GMW3232);
FMVSS 302; FLTM BN 024-02; GB 8410;
GMW3232; Honda HES D 6003; ISO3795;
Mazda MES CF 050C; Mitsubishi ES-X60410;
Nissan NES M0094; SAE J 369;
Toyota TSM0500G;
Volvo STD 104-0001;
VW PV3904**Flex/Fold**

Bally Flex

ASTM D6182;
ISO 5402-1

Cold Fold – Cold Crack/Dynamic Flex

LP-463KB-28-01 (Method A);
SAE J323 (Method C)

Flex & Fold

LP-463LB-09-01

Pinch Fold/Cold Crack

LP-463KB-28-01 (Method C)

Newark/W Flex

ASTM D2097;
FLTM BN 002-03;
FLTM BN 102-02

Vinyl Crazing

GM9143P²**Fogging**Chrysler: LP-463DB-12-01;
DIN 75 201;
Fuji: TS420-00-032;
GM: GMW3235;

Test:

Test Standard(s):

Fogging (cont'd)

Honda: HES D6508;
Hyundai/Kia: MS300-54;
ISO 6452;
Mitsubishi: ES-X83231 (Methods A and C);
Nissan: NES M0161;
PSA Peugeot: D45 1727;
SAE J1756;
Tesla: SAE J1756, ISO 6452;
Toyota: TSH1564G, TSM0503G;
Volkswagen: PV3015;
Volvo: STD 420-0003

Amine Fogging

Toyota: TSM0503G, BSDM0503

FTIR-Infrared Analysis

ASTM E334;
ASTM E1252

Gas Fade/Burnt Gas

AATCC 23;
ISO 105-G02

Hardness

Pencil

ASTM D3363;
Honda: 0096Z-SEC-A000 (section 5.3.1)

Durometer

ASTM D2240;
ISO 868;
ISO 48-4;
ISO 7619-1²

Rockwell Hardness

ASTM E18

Microhardness

ASTM E384

Rockwell Hardness Plastic Scale

ASTM D785

Humidity

ASTM D1735;
ASTM D2247;
GMW14729;
ASTM D3574-L

Cleveland Condensing

FLTM BI 104-02 (A & B)

Impact

Ball, Tup, Pendulum

FLTM BO 151-01;
GMW14093;
ISO 6603-1

Charpy

ISO 179-1

Cold Crack

GMW14126;
GMW14127;
LP-463KB28-01 (Method B);
SAE J323-B

<u>Test:</u>	<u>Test Standard(s):</u>
Impact (cont'd)	
Gravelometer/Chip Resistance	GMW14700; SAE J400
Izod	ASTM D256; ISO 180
Multi-Axial	ASTM D3763; ISO 6603-2
Stress Mark Susceptibility	GM9302P ² (03/14 replaced by GMW17141); GMW17141
Immersion	
Water	FLTM BI 104-01 (Procedure B & C); FLTM BI 104-04
Wicking	ASTM D751 (sections 99-103); GM9146P (<i>except section 4.3</i>) ¹ ; SAE J913
Mace Snagging	FLTM BN 108-11
Melt Flow	ASTM D1238; ISO 1133-1, -2
Metals	
Carbon/Sulphur Analysis	ASTM E1019
Preparation of Metallographic Specimens	ASTM E3
Melting, Crystallization, and Tg (DSC)	ASTM E794; ASTM E1356; ASTM D3418; ISO 11357-1, -2, -3
Mildew, Mold, Fungi	GMW3259
Odor	FCA: LP-463KC-09-01; Ford: FLTM BO 131-01; Ford: FLTM BO 131-03; GM: GMW3205; Honda: 0096-SEC-A000, (sections 5-12); D 6506-00, (section 5.20); 7426Z-SMP-000, (section 4-2-9); 7710Z-TBAA-9010, (sections 6-16); 7710Z-TBA-9000, (sections 6-19); 7710Z-TBAA-9000, (sections 6-19); 7850Z-TX4-0000, (section 6); 8320Z-SW5-9000, (sections 5-19);

Test:

Test Standard(s):

Odor (cont'd)

8320-T5A-0000, (sections 6-14);
8330Z-T5A-0000, (sections 6-17);
8420Z-SLJ-0000, (sections 7-18);
Hyundai Kia: MS 300-34;
Jaguar: TP JLR 52.458;
SAE J1351;
Toyota: TSM0505G (*except Water Extraction Method*);
Boshoku BDSM0505 (*except Water Extraction Method*);
VDA 270;
Volkswagen: VW PV3900;
Volvo: STD 429-0001, FLTM BO 131-01

Oven/Exposure Cycle

Accelerated Aging

ASTM D751 (sections 77-84);
ASTM D3574-K;
FLTM BN 113-02;
GMW14709²;
LP-463LB-13-01

Ash Content

ASTM D2584;
ASTM D5630-B;
FLTM BO 006-01;
GM9077P² (Inactive 03/2013, no replacement);
ISO 3451-1 (Method A)

Blocking

ASTM D751 (sections 89-93);
GMW14132

Environmental Cycle

FLTM BO 040-01;
LP-463LB-12-01;
GMW14124 (All Tables)

Thermo Oxidative Stability

ASTM D3012

pH of Aqueous Solutions

ISO 3071; ISO 4045

Pilling/Minking/Lint

Brush & Sponge

LP-463KB-37-01;
FLTM BN 108-03;
FLTM BN 108-14

Random Tumbler

LP-463KB-38-01-A;
GMW3347

Plastics

Determination of Temperature of
Deflection Under Load (HDT)

ISO 75-1; ISO 75-2;
ASTM D648 Method B

Determination of Vicat Softening
Temperature

ISO 306

<u>Test:</u>	<u>Test Standard(s):</u>
Ravel Resistance Scott-type	GMW3217
SEM/EDS Scanning Electron Microscope (SEM)	ASTM E986
Energy dispersive x-ray spectroscopy (EDS)	ASTM E1508
Scratch/Mar Abrex – Nail Scratch	BMW: GS97034-2
5 Finger	LP-463DD-18-01; FLTM BN 108-13; GMW14698
Erichsen Scratch and Mar	GMW14688; LP-463DD-18-02; PV3952; 7-M0005
Paperclip	GMW14130
Shear Scratch	8320Z-SW5-9000 (section 5.9); 3520Z-SFY-0000 (section 6.7); TSL3610G (section 7.11); TSL5100G (section 4.23); TSM5754G (section 4.14); TSM6734G (section 5.5)
Scuffing/Mar Taber Scuff Finger	FLTM BN 108-04; SAE J365
Seam Strength Conditioning + Tensile	ASTM D751 (sections 71-76); MS.50019 (Annex A); FLTM BN 119-01; GMW14145
Seam Fatigue	FLTM BN 106-02; GMW3405; GM9129P ²
Soiling & Cleanability	FLTM BN 112-08; LP-463KC-04-01; LP-463KC-04-02 (Procedures 1 & 2); GMW3402
Anti-Fouling	8320Z-SW5-9000 (sections 5.23.1 & 2)
Martindale	LP-463KC-04-03; GMW15377

<u>Test:</u>	<u>Test Standard(s):</u>
Sulfur Dioxide/Hydrogen Sulfide Resistance	
Immersion/Gas Staining	ASTM D1712; FLTM AN 102-01; SAE J322
Spot Test	GMW14864
TGA - Thermogravimetric Analysis	ASTM E1131
Thermal Shock	FLTM BI 107-05; GMW15919; LP-463PB-64-01
Tensile	
Adhesive Strength	FLTM BN151-01; FLTM BN 151-05; GMW14757; ISO 8510-2
After Autoclave	ASTM D3574-J; FLTM BO 012-01
Bolt Pull Out	FLTM BA 116-01
Bond Strength	FLTM BN 121-01; GMW3220; LP.7M008 (Part A)
Breaking Strength	ASTM D751 (sections 11-17); ASTM D2208; ASTM D3759; ASTM D5034; ASTM D5035; ISO 13934-1; ISO 13934-2
Compression	ISO 844 (Procedure A); SAE J1352
Flexural Properties	ASTM D790; ISO 178
Coefficient of Friction	ASTM D1894; GMW3289 ² ; LP-463AB-52-01 ²
Indentation Force Deflection	ASTM D3574-B1, X3.1, X3.3
Loop Pull-Out	GMW14148
Metals	ASTM E8
Modulus of Bending	SAE J949

Test:

Test Standard(s):

Tensile (cont'd)

Peel

ASTM D751 (sections 50-53);
ASTM D903; ASTM D3330;
GMW15201

Poisson's Ratio

ISO 527

Shear Test

ASTM D732;
ASTM D1002;
LP-463TB-08-01;
FLTM BU 101-06

Snag

GMW14775²

Stitch Tear

ASTM D4705;
GMW14146;
ISO 23910

Tensile Properties
(-40 to 120) °C
(≤ 20,000 lbs)

ASTM D412-A (*except sections 12.2 & 12.3*);
ASTM D638;
ASTM D882;
ASTM D1708;
ASTM D3574-E;
LP-463NB-17-01;
LP-463TB-04-01;
FLTM BN 150-04;
GMW3010;
GMW14695;
ISO 37;
ISO 9073-3;
ISO 527;
ISO 1798

Tear

ASTM D624 (die C, *except appendix*);
ASTM D751 (sections 33-40);
ASTM D1004;
ASTM D2261;
ASTM D3574-F;
ASTM D5587;
ASTM D5733² (withdrawn 2008, no replacement);
FLTM BN 150-02;
GMW3326;
ISO 34-1;
ISO 6383-1;
ISO 9073-4;
ISO 13937-2

Tuft Lock

ASTM D1335;
LP-463KB-22-01

Two Shot / Over Mold

GM17084

<u>Test:</u>	<u>Test Standard(s):</u>
Weathering QUV	ASTM D4587; ASTM G154
Xenon	AATCC 16.3; ASTM D7869; FLTM BO 116-01; NES M0135-2001-N; SAE J2412; SAE J2527
Fiber Degradation after Xenon	FLTM BN 117-03; GMW3387

<u>Test:</u>	<u>Parameter/Range:</u>	<u>Test Method:</u>
<u>3D Scanner:</u> GOM/ATOS	560 mm ³	GD&T
<u>Environment Exposure</u> ³ : Temperature Humidity Chamber Size	(-65 to 177) °C (20 to 95) %RH, up to 85 °C (max.) to 26 ft. deep by 16 ft. wide by 10 ft. high (full vehicles)	FLTM BQ 104-07
<u>Structure</u> ³ : (Hoods, Decklids, Fenders, Other Automotive Components) Deflection and Set	± 3 in. displacement, 10,000 lbf	TS371-06-003
<u>Dimensional Stability (including the use of LVDTs, Load Cells and Pressure Transducers):</u>		TS371-06-003
<u>Pneumatic Cycling Durability</u> ³ : Sunshade Assemblies Hood Systems Rear Compartment Systems Consoles Ashtrays Glove Boxes Armrests Door Handles Trim Panels (interior and exterior) Latches Mirrors	Ambient or (-40 to 120) °C	TS371-06-003
<u>Servo Hydraulic Fatigue Test for Load or Displacement</u> ³ :	(2.5 to 10) KIP Up to 6.0 inches travel 10 Hz max. frequency	TS371-06-003

<u>Test:</u>	<u>Parameter/Range:</u>	<u>Test Method:</u>
<u>Thermal Shock</u> ³ :	(-40 to 177) °C 8 ft ³ basket	GMW 14124
<u>Vibration</u> ³ :		
Sine	3 in. displacement	CETP-00.00-E-412
Random	(20 to 2500) Hertz	
Classical Shock	11,000 pounds force Up to 80 g's Up to 11 milliseconds	

¹ This accreditation covers testing performed at the main laboratory listed above, and the satellite laboratory listed below.

² This laboratory's scope contains withdrawn, inactive or superseded methods. As a clarifier, this indicates that the applicable method itself has been withdrawn or is now considered "historical" and not that the laboratory's accreditation for the method has been withdrawn.

³ This laboratory also uses customer supplied specifications and/or methods directly related to the testing technologies and parameters listed above.

32049 Milton Avenue
Madison Heights, MI 48071

<u>Test:</u>	<u>Parameter/Range:</u>	<u>Test Method:</u>
<u>Sound & Vibration {Sound Subjective Only}</u>	Hemi-Anochoic Room; MB Dynamic Shaker with VR Controller	CETP-00.00-E-412



Accredited Laboratory

A2LA has accredited

RELIABLE ANALYSIS, INC.

Madison Heights, MI

for technical competence in the field of

Mechanical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 30th day of June 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0386.01
Valid to May 31, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.