



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

RELIABLE ANALYSIS INC.
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Madison Heights, MI 48071
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MECHANICAL

Valid To: May 31, 2019

Certificate Number: 0386.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory 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:

Standard:

Abrasion

Abrex

BMW: AA P 296; AA-6471; 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;
ISO 12947

Snagging

SAE J948

Taber

ASTM D3884; ASTM D4060;
FLTM BN 108-02;
GM9337P;
GMW3208;
SAE J948

Veslic

ISO 11640 (*except sections 6.3 & 6.4*)

Wyzenbeek

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

Chemical Wear

LP-463KC-22-01;
SAE J948

Test:**Standard:****Abrasion (cont'd)**

Fiber Loss after Abrasion

SAE J1530

Adhesion

Dime Scrape

GM9506P¹ (06/13 inactive, no replacement)

Paint/Tape

ASTM D3359;
LP-463LB-19-01;
FLTM BI 106-01;
GM9160P;
GMW14829;
GMW15201

Saw Grind

ASTM B571 (section 8)

Thumbnail

GM9507P¹ (06/11 inactive, no replacement)**Air Permeability**ASTM D737;
ASTM D3574 (Method G);
ISO 7231 (Method A)**Appearance**

Color

ASTM D2244;
SAE J1545

Gloss

ASTM D523

Grain Retention

GM9142P

Bending/Flex/Mandrel

Cantilever/Textile

GM9664P;
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

Stiffness

ASTM D747

Chemical Resistance & Colorfastness

Acid Spotting

LP-463-KC-16-01

Amine Resistance

GMW14131;
VDA 230-223

Test:

Standard:

Chemical Resistance & Colorfastness (cont'd)

Automotive Fluids	GM9509P; 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 113-03; 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 (inactive 03/16, replaced by GMW14102); GMW14102
Suntan/Insect Repellent	Ford DVM0036; Ford DVM0039; FLTM BI 113-08; GMW14445

Coefficient of Linear Thermal Expansion by TMA

ASTM E831

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



Test:

Standard:

Compatibility (cont'd)

Vinyl Leather

GM9141P

Migration Staining/Dye Transfer

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

Compression/Foam

Compression Set

ASTM D3574-D;
FLTM BN 115-07;
ISO 1856

Resilience (Ball Rebound) Test

ASTM D3574-H

Dynamic Fatigue Test by Constant
Force Pounding

ASTM D3574-I₃

Load Deflection

ASTM D1056 (sections 17-22);
ASTM D3574 (B₁, C, N);
ISO 3386

Corrosion/Salt Spray

CASS

ASTM B368;
FLTM BQ 105-01;
GMW14458

Creep Back

GMW15282

Corrodokote Test – Russian Mud

ASTM B380;
FLTM BQ 004-01

Salt Spray

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

Density/Weight

ASTM D1475;
ASTM D3574-A;
FLTM BN 106-01;
GMW3182

Mass

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



Test:

Standard:

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	GM9317P; GMW4726

Dimensional/Measuring/Shrinkage

Fabrics	ASTM D751 (sections 7.1 and 8);
Length	ASTM D3773-A;
Width	ASTM D3774;
Fabric Count	ASTM D3775
Measurements	FLTM BN 105-01; FLTM BN 105-03; FLTM BO 129-01; GM9230P; GM9330P ¹ (08/15, replaced by GMW4089); GMW4089; GMW4217; GMW14773; ISO 1923; ISO 2577; SAE J883
Stretch & Set	ASTM D751 (sections 80-83); 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 DIN 17226-2; DIN EN ISO 14184-1; STJLR.51.5232
Total VOC	FLTM BZ 157-01; GMW8081; PV 3341; VDA 277; TS-INT-002; STD 429-0003; STJLR.51.5229



Test:

Standard:

Emissions (cont'd)

VOC/SVOC/FOG

VDA 278;
GMW15634

Sampling Bag Method for Measuring
VOC from Vehicle Interior
Compartment

ISO 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; TSM0508G

Micro-Scale Chamber for Determining
VOC Emissions

ISO 12219-3; ISO 16000-3; ISO 16000-6;
FCA CS-13398; FLTM BZ 151-01

Organotin,
Soluble Mineral
Tanning Agents
& Heavy Metals

WSS M99P2222D1 (section 3.3);
ISO 105-E04; ISO 17353

Flammability

CMVSS 302; DBL 5307; DIN75-200;
EDS-T-7602¹ (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

GM9143P

Fogging

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



Test:

Standard:

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

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 7619-1

Humidity

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

Cleveland Condensing

FLTM BI 104-02 (A & B)

Imaging

3D Scanning Methodology:
Scanning Volume -
200mm x 150mm x 150mm

Customer Supplied Specifications

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



Test:**Standard:****Impact (cont'd)**

Gravelometer/Chip Resistance

GMW14700;
SAE J400

Izod

ASTM D256;
ISO 180

Multi-Axial

ASTM D3763;
ISO 1431-1; ISO 6603-2

Stress Mark Susceptibility

GM9302P¹ (03/14 replaced by GMW17141);
GMW17141**Immersion**

Water

FLTM BI 104-01 (Procedure B & C);
FLTM BI 104-04

Wicking

ASTM D751 (sections 94-98);
GM9146P (*except section 4.3*);
SAE J913**Mace Snagging**

FLTM BN 108-11

Melt FlowASTM D1238;
ISO 1133-1, -2**Melting, Crystallization, and Tg (DSC)**ASTM E794;
ASTM E1356;
ASTM D3418;
ISO 11357**Mildew, Mold, Fungi**ASTM G21;
GMW3259;
GMW16124**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);
8320-T5A-0000, (sections 6-14);
8330Z-T5A-0000, (sections 6-17);
8420Z-SLJ-0000, (sections 7-18);
Hyundai Kia: MS 300-34;

Test:

Standard:

Odor (cont'd)

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

Ozone

ASTM D1149;
FLTM BP 101-01;
ISO 1431-1

Oven/Exposure Cycle

Accelerated Aging

ASTM D751 (sections 72-79);
ASTM D3574-K;
FLTM BN 113-02;
GMW14709;
LP-463LB-13-01

Ash Content

ASTM D2584;
ASTM D5630-B;
FLTM BO 006-01;
GM9077P¹ (Inactive 03/2013, no replacement);
ISO 3451-1 (Method A)

Blocking

ASTM D751 (sections 84-88);
GMW14132

Color Change

GM9131P

Dust Out

GMW16998

Environmental Cycle

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

Shear

FLTM BV 120-02

Softening Point-Adhesive Tapes

LP-463TB-14-01

Spue Test

LP-463LB-05-01

Sunlamp Oven

FLTM BO 115-01; FLTM BO 115-02;
GMW14757

VOC Sealers/Adhesives

GMW3016

pH of Aqueous Solutions

ISO 3071; ISO 4045



Test:

Standard:

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

Determination of Vicat Softening
Temperature

ISO 306

Ravel Resistance

Scott-type

GMW3217

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 66-71);
MS.50019 (Annex A);
FLTM BN 119-01;
GMW14145

Seam Fatigue

FLTM BN 106-02;
GMW3405;
GM9129P



Test:**Standard:****Soiling & Cleanability**FLTM BN 112-08;
LP-463KC-04-01;
LP-463KC-04-02 (Procedures 1 & 2);
GM9156P;
GMW3402

Anti-Fouling

8320Z-SW5-9000 (sections 5.23.1 & 2)

Martindale

LP-463KC-04-03;
GMW3402; GMW15377**Staining**

Asphalt

LP-463PB-57-02

Sulfur Dioxide/Hydrogen Sulfide Resistance

Kesternich

ASTM G87;
ISO 3231

Immersion/Gas Staining

ASTM D1712;
FLTM AN 102-01;
SAE J322;

Spot Test

GMW14864

TGA - Thermogravimetric Analysis

ASTM E1131

Thermal ShockFLTM BI 107-05;
GMW15919**Tensile**

Adhesive Strength

FLTM BN151-01;
GMW14757

After Autoclave

ASTM D3574-J;
FLTM BO 012-01

Bond Strength

FLTM BN 121-01;
GMW3220;
LP.7M008

Breaking Strength

ASTM D751 (sections 11-17);
ASTM D2208;
ASTM D3759;
ASTM D5034; ASTM D5035

Coefficient of Friction

ASTM D1894;
GMW3289;
LP-463AB-52-01

Compression

ISO 844 (Procedure A);
SAE J1352

Test:

Standard:

Tensile (cont'd)

Hook & Loop

GM9207P

Flexural Properties

ASTM D790;
ISO 178

Friction

ASTM D1894;
GMW3289;
LP-463AB-52-01

Indentation Force Deflection

ASTM D3574-B1, X3.1, X3.3

Loop Pull-Out

GMW14148

Modulus of Bending

SAE J949

Peel

ASTM D751 (sections 45-48);
ASTM D903; ASTM D3330;
LP-463TB-03-01 (02/17, replaced by ASTM D3330);
GMW15201

Poisson's Ratio

ASTM E132

Shear Test

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

Snag

GMW14775

Stitch Tear

ASTM D4705;
GM9149P;
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



Test:

Standard:

Tensile (cont'd)

Tear

ASTM D624 (die C, *except appendix*);
ASTM D751 (sections 26-35);
ASTM D1004;
ASTM D2261;
ASTM D3574-F;
ASTM D5587;
ASTM D5733¹ (withdrawn 2008, no replacement);
FLTM BN 150-02;
GM9149P;
GMW3326;
ISO 34-1;
ISO 6383-1;
ISO 13937-2

Tuft Lock

LP-463KB-22-01

Wrinkling

GMW14757

Weathering

Xenon

AATCC 16;
ASTM D4459;
ASTM D7869;
FLTM BO 116-01;
NES M0135-2001-N;
SAE J2412;
SAE J2527

Xenon

Fiber After Degradation

FLTM BN 117-03;
GMW3387



<u>Test:</u>	<u>Parameter/Range:</u>	<u>Test Method:</u>
3D Scanner: GOM/ATOS		
<u>Environment Exposure</u> ² :		FLTM BQ 104-07
Temperature	(-65 to 177) °C	
Humidity	(20 to 95) %RH, up to 85 °C	
Chamber Size	(max.) to 26 ft. deep by 16 ft. wide by 10 ft. high (full vehicles)	
<u>Structure</u> ² : (Hoods, Decklids, Fenders, Other Automotive Components)		TS371-06-003
Deflection and Set	± 3 in. displacement, 10,000 lbf	
<u>Dimensional Stability (including the use of LVDTs, Load Cells and Pressure Transducers):</u>		TS371-06-003
<u>Pneumatic Cycling Durability</u> ² :	Ambient or (-40 to 120) °C	TS371-06-003
Sunshade Assemblies		
Hood Systems		
Rear Compartment Systems		
Consoles		
Ashtrays		
Glove Boxes		
Armrests		
Door Handles		
Trim Panels (interior and exterior)		
Latches		
Mirrors		
<u>Servo Hydraulic Fatigue Test for Load or Displacement</u> ² :	(2.5 to 11) KIP Up to 6.0 inches travel 30 GPM pump 3000 psi pressure 10 Hz max. frequency	TS371-06-003
<u>Thermal Shock</u> ² :	(-40 to 177) °C 8 ft ³ basket	GMW 14124
<u>Variable Surface Heat Exposure:</u>		GM9310P ¹ (inactive 01/11); GMW15432
<u>Vibration</u> ² :		
Sine	3 in. displacement	SDS: EY-0128
Random	(20 to 2500) Hertz	(WDS 00.00ES-D11-18)
Classical Shock	11,000 pounds force Up to 80 g's Up to 11 milliseconds	
<u>Resistance:</u> Megohms		Fiat Auto 7.Z0250

¹ NOTE: 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.

²This laboratory also uses customer supplied specifications and/or methods directly related to the testing technologies and parameters listed above.





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 17025:2005 *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 8 January 2009).



Presented this 5th day of September 2017.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 0386.01
Valid to May 31, 2019

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