

EVOPRENE™ LF & GF Thermoplastic Elastomer (TPE) Compounds

Two ranges of HSBC based Evoprene™ TPE compounds have been created for the Automotive Industry, both specially formulated to have very low fogging characteristics suitable for automotive interior applications. Evoprene™ LF grades meet the requirements of the Reflectance Fogging test according to SAE J1756 whilst the Evoprene™ GF grades satisfy the DIN 75201B Gravimetric Fogging standard. Different automotive makers prefer different methods.

All these Evoprene™ compounds are based on the well established hydrogenated styrene block copolymer (HSBC) TPE technology which offers a great blend of performance and processing characteristics to both automotive designers and processors alike. All grades can be injection moulded or extruded on standard thermoplastics equipment – full details are available in our Evoprene™ processing guides. Compounds can be formulated at various levels of UV resistance, depending on where in the vehicle the parts are to be used. Whilst they are normally supplied as natural for masterbatching, or black, Evoprene™ LF and GF compounds can be colour matched to specific automotive requirements when produced in longer compound runs. Heat ageing tests demonstrate these compounds are thermally stable to well beyond the maximum and minimum temperatures recorded in cars and trucks.



Evoprene™ compounds are compliant with many major OEM specifications including

- Ford WSS-M2D507
- Daimler DBL 5562 Type 10
- GM QK 00 7000
- Holden HN 2479 Type 1&2

Typical applications include

- Trinket mats
- Handbrake grips and gear knobs
- Pillar trim skins
- Vent wheels
- Seat belt scabbards & other seating components
- Armrest skins
- Bump stops etc.

Need more information? Visit www.alphagary.com or send us an email at enquiries@alphagary.com or call:

UK Office: +44 (0) 1664 502222

AlphaGary Ltd, Beler Way, Melton Mowbray, Leicestershire LE13 0DG (UK)

US & Canada Office: 978-537-8071 / 800-232-9741

AlphaGary Canada Ltd, 5 Pinelands Avenue, Stoney Creek, Ontario L8E 3A4 (Canada)

AlphaGary Corporation, 170 Pioneer Drive, Leominster, MA 01453 (USA)

AlphaGary Corporation, 9635 Industrial Drive, Pineville, NC 28134 (USA)

Additional Information about:

- Material Selection
- Processing
- Mould Shrinkage
- Chemical Resistance
- Packaging & Labeling

AlphaGary
Evoprene™
25 Years of
Know-How!

can be obtained by visiting www.alphagary.com, emailing us at enquiries@alphagary.com, or contacting one of our offices

Evoprene™ LF Series

Formulated to meet the requirements of automotive Reflectance Fogging test according to SAE J1756

Property	Standard	Grade							
		6150	6151	6152	6153	6154	6156	6158	6160
Hardness ShA	ISO 868 15 sec	44	47	57	58	65	77	85	95
Density +/- 0.05 g/cm ³	ISO 1183	0.90	0.89	1.03	0.90	0.90	0.91	0.88	1.04
Tensile Strength MPa	ISO 37	4.0	3.9	4.5	5.4	6.1	9.1	16.5	17.6
Elongation @ break %	500mm/min	525	345	405	630	400	630	530	390
Modulus @ 100% MPa	Measured parallel to flow	2.0	2.3	2.4	2.5	3.6	4.8	9.2	13.5
Tear strength KN/min	ISO 34 Method B								
Parallel to flow		21	20	22	25	19	47	105	81
Perpendicular to flow		27	31	25	30	30	57	102	104
Compression set %	ISO 815 large plied specimens								
72 hr @ 23°C +/- 1°C		17	13	18	27	19	27	41	X
24 hr @ 70°C +/- 2°C		32	30	29	47	30	45	58	X
Tensile set % 22h @ 70°C	VDA 675 217B	44	47	57	58	65	77	85	95
Brittleness point °C	ASTM D 746	-60	-60	-60	-60	-60	-60	-44	-21
Ozone resistance	100 pphm/200hr/20% strain	0	0	0	0	0	0	0	0
Heat ageing	ISO 188 1000 hr @ 100+/- 2°C 150+/- 50 air changes / hour								
? Hardness deg		-1	-2	-1	-2	-5	-2	0	-3
? T/S % max		-0.1	-11	+21	+3	-19	-1.4	+2	+2
? E/B % max		-2	+6	+30	+2	-10	-6	-8	-6
? length % max		-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
? volume % max		-0.7	-1.8	-1.0	-0.5	-2.6	+3.0	-2.2	-0.5
Dry cycle ageing, 4 cycles	4h @ 90°C / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT – evaluate for aesthetics	OK	OK	OK	OK	OK	OK	OK	OK
Humid cycle ageing, 10 cycles	4h @ 90°C / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT / 3h @ 70°C, 95% RH / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT 4 cycles or 10 cycles – evaluate for aesthetics	OK	OK	OK	OK	OK	OK	OK	OK
Peak temperature 3hr °C	No distortion	165	165	165	165	165	170	170	165
Flammability, burn rate	mm / minute	42	43	46	45	37	54	51	51
Fogging, Reflectance %	SAE J 1756 3h heat @ 121°C, 21°C cooling plate, post test conditioning 1h & 16h	83	80	87	86	81	91	89	76
Fogging, gravimetric mg	DIN 75201B	1.0	X	X	0.6	0.3	0	1.0	X
Odour rating Dry	SAE J1351 / FLTM BO131-01	2	2	2	2	2	2	2	2
Temp shock 16h @ -40°C	No aesthetic faults	OK	OK	OK	OK	OK	OK	OK	OK
Resistance to liquids	Wet test piece with 1ml fluid, store 1h (+10/-0 min) at 23°C, clean & evaluate for aesthetics								
Tap water		OK	OK	OK	OK	OK	OK	OK	OK
Distilled water		OK	OK	OK	OK	OK	OK	OK	OK

This information is intended for general guidance only and may contain information which could be inappropriate under particular conditions of application or use. Each customer or user must conduct its own studies to check for suitability for the intended end use.

Evoprene™ GF Series

Formulated to meet the requirements of automotive Gravimetric Fogging standard DIN 75201B

Property	Standard	Grade						
		6250	6252	6254	6255	6256	6257	6258
Hardness ShA	ISO 868 15 sec	47	56	65	67	78	83	86
Density +/- 0.05 g/cm ³	ISO 1183	0.89	0.90	0.90	0.89	0.89	0.90	0.90
Tensile Strength MPa	ISO 37 500mm/min Measured parallel to flow	6.2	6.4	8.2	7.1	7.9	9.7	10.7
Elongation @ break %		550	470	500	680	585	560	590
Modulus @ 100% MPa		2.8	2.1	3.0	2.4	3.7	4.8	5.8
Tear strength KN/min	ISO 34 Method B							
Parallel to flow		17	23	33	36	43	54	75
Perpendicular to flow		33	37	42	36	34	57	51
Compression set %	ISO 815 large plied specimens							
72 hr @ 23°C +/- 1°C		20	14	18	26	34	31	44
24 hr @ 70°C +/- 2°C		33	38	36	41	47	52	51
Tensile set % 22h @ 70°C	VDA 675 217B	45	33	47	54	67	62	40
Brittleness point °C	ASTM D 746	-60	-60	-60	-60	-60	-56	-52
Ozone resistance	100 pphm/200hr/ 20% strain	0	0	0	0	0	0	0
Heat ageing								
? Hardness deg	ISO 188 1000 hr @ 100+/- 2°C 150+/- 50 air changes / hour	+1	+1	+4	+3	+6	+2	+3
? T/S % max		+17	+9	+24	-4	+13	+7	-15
? E/B % max		+4	+2	+11	-6	+7	+4	-14
? length % max		-1.0	-0.1	-0.4	-0.5	-0.5	-0.4	-0.4
? volume % max		-1.9	-2.3	-2.5	-1.5	-1.3	-1.5	-1.1
Dry cycle ageing, 4 cycles	4h @ 90°C / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT – evaluate for aesthetics	OK	OK	OK	OK	OK	OK	OK
Humid cycle ageing, 10 cycles	4h @ 90°C / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT / 3h @ 70°C, 95% RH / 0.5h @ RT / 1.5h @ -40°C / 0.5h @ RT 4 cycles or 10 cycles – evaluate for aesthetics	OK	OK	OK	OK	OK	OK	OK
Peak temperature 3hr °C	No distortion	150	150	150	150	150	150	150
Flammability, burn rate	mm / minute	42	45	39	44	47	43	49
Fogging, Reflectance %	SAE J 1756 3h heat @ 121°C, 21°C cooling plate, post test conditioning 1h & 16h	61	63	63	59	54	49	55
Fogging, gravimetric mg	DIN 75201B							
Odour rating Dry	SAE J1351 / FLTM BO131-01	2	2	2	2	2	2	2
Temp shock 16h @ -40°C	No aesthetic faults	OK	OK	OK	OK	OK	OK	OK
Resistance to liquids	Wet test piece with 1ml fluid, store 1h (+10/-0 min) at 23°C, clean & evaluate for aesthetics							
Tap water		OK	OK	OK	OK	OK	OK	OK
Distilled water		OK	OK	OK	OK	OK	OK	OK

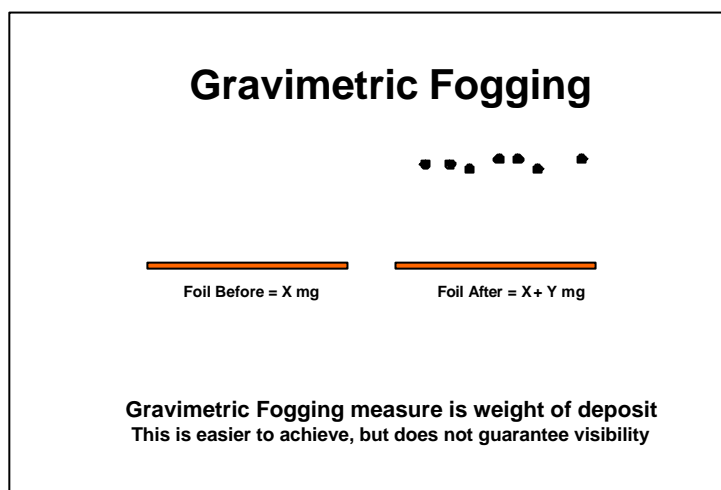
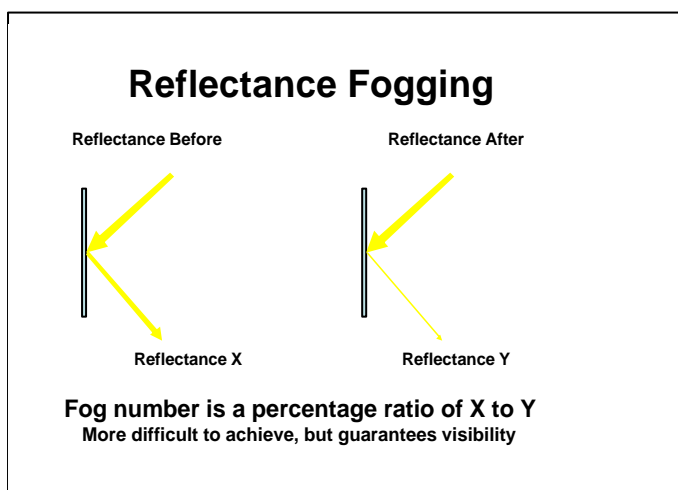
This information is intended for general guidance only and may contain information which could be inappropriate under particular conditions of application or use. Each customer or user must conduct its own studies to check for suitability for the intended end use.

WHAT IS FOGGING ?

A major concern for OEMs is the effect of windscreen fogging caused by the build up of greasy deposits on the interior of the windscreen. This is seen as safety critical due to reduced visibility and adversely affects the end customer's perception of the vehicle. There are two main methods of measurement - gravimetric and reflectance.

Reflectance is a measurement of the light transmission property of glass and gives a direct indication of how a given material will affect visibility. Major OEMs specify minimum reflectance fog numbers of 70%, with standards now moving towards 80 or 90%. The **Evoprene™ LF** Series has been formulated to achieve this level of performance with all grades exceeding the basic 70%, most exceeding 80 and some even exceeding 90%.

Gravimetric fogging tests measure the weight of volatiles emitted and condensed on the glass. The **Evoprene™ GF** range is designed to meet this standard.



SCRATCH & MAR

Another concern for elastomeric materials used in vehicle interiors is scratch and mar. All Evoprene™ LF and GF compounds are unfilled to reduce this effect, especially with regard to the white marks that are often evident on cheaper, filled materials. However, should you have a non-cosmetic application that still requires the low fog performance of Evoprene™ LF or GF, but where visual marking is less important, we would be pleased to work with you to offer more cost effective, filled versions.

RESTRICTIVE SUBSTANCE COMPLIANCE

All Evoprene™ LF and GF compounds are compliant with the Restricted Substances standards of the major OEMs as well as other International Standards supported by the IMDS system. With our extensive automotive knowledge we can offer a full PSW service plus APQP participation at the request of your engineers giving you a fully certified solution to your soft-touch needs.