



# **AMECA List of Diffusing Plastic Materials**

June 21, 2024



**List of**  
**SAE J-576 Diffusing Plastics Used on Motor Vehicles**

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**June 21, 2024 Edition**

**Automotive Manufacturers Equipment Compliance Agency, Inc.  
1025 Connecticut Avenue, NW Suite #1000  
Washington DC 20036**

**[www.ameca.org](http://www.ameca.org)**

## 1. STATUS

The following materials have been accepted by the Automotive Manufacturers Equipment Compliance Agency as meeting the weathering test of SAE J576 for used on motor vehicles. No evaluation has been made as to the suitability of individual materials for particular automotive uses, or to the manufacturing methods.

***You must contact the resin or coating manufacturer to determine the best material for your application.***

***Every plastics resin manufacturer has specialized products for different applications, processing conditions, manufacturing equipment, light sources and final use.***

The device manufacturers must ensure that the lenses molded from acceptable materials meet the color and plastic stability test requirements for each individual device.

## 2. LISTING

The material is listed by the manufacturer's name, trade name and flow formulation, type of resin, color number and color.

## 3. DISTRIBUTION

This list is distributed free on a monthly basis. Any revised or pre-release editions may be obtained by contacting AMECA.

## 4. DEFINITIONS

Coating -- Material applied to surface of the lens to improve some aspect of performance.

Coated materials-- a material which has a coating applied to the surface of the finished sample to impart some protective properties. Coating identification means a mark of the manufacturer's name, formulation designation number, and recommendations for application.

Color bleeding -- the migration of color out of a plastic part onto the surrounding surface.

Cracking -- a separation of adjacent sections of a plastic material with penetration into the specimen.

Crazing -- a network of apparent fine cracks on or beneath the surface of materials.

Delamination -- a separation of the layers of a material including coatings.

Hard Coat --     1) Coating which is cured by UV radiation.  
                  2) Coating which provides additional resistance to abrasion or scratching which may be cured by thermally or by UV radiation. May contribute to long term durability of material.

**NOTE:** Both definitions are being used--please verify the intended performance when discussing hard coats.

Haze -- the cloudy or turbid appearance of an otherwise transparent specimen caused by light scattered from within the specimen or from its surface.

UV-protective Coat -- Coating designed to provide additional protection from the sun's electromagnetic radiation, particularly those wavelengths in the UV bandwidth. Often used on polycarbonate substrates to improve weathering performance. Polycarbonates must be coated for use in or in front of reflex reflectors.

Reflex reflectors-- devices used on vehicles to give an indication to approaching drivers using reflected light from the lamps of the approaching vehicle.

Substrate -- Base material to which all other performance enhancing materials are added.

UV radiation -- Short wavelength, high energy radiation emitted by the sun or other object (HID lamp). Wave lengths between 10 and 380 nm.

HID Lamp -- High Intensity Discharge Lamp. Lamps produce light by the use of a stabilized arc. Lamps can produce significant UV radiation which may require special materials. See SAE J-1647

## 5. NOTE ON COLOR

The colors listed have been determined to be in compliance with SAE J-578 using the ASTM E 308-66 method in thicknesses specified by the resin manufacturer (SAE J576 S4.1).

**NOT EVERY COLOR LISTED WILL MEET SAE J-578 COORDINATES  
FOR YOUR INTENDED THICKNESS**

**NOT EVERY MATERIAL IN EVERY COLOR WILL MEET J578 WITH  
LED OR ILLUMINANT C LIGHTSOURCES**

**CHECK WITH THE RESIN MANUFACTURER'S COLOR SPECIALIST**

The ASTM E 308-66 method uses an illuminant A light source energized to 2856k. *If you use anything other than an incandescent light source at 2856k you MUST verify that the resulting color meets the specifications of SAE J-578 for your intended thickness.* Halogen light sources at 3200k, illuminant C (strobe) and LED light sources can alter the color output. In addition, some light sources do not emit color or luminous flux uniformly. Measurements should be made to verify that the emitted light using your intended lightsource meets the specifications of J-578 throughout its photometric range.

## 6. NOTE ON INNER LENS COLOR

***Combinations of inner and outer lenses with various colors may not perform predictably. Output can vary with different light sources. Check with the resin manufacturer's color specialist when making selections.***

## 7. NOTE ON "EQUIVALENT" FORMULATIONS.

Many companies have distributed manufacturing facilities, cooperative agreements or joint ventures. In order to list a facility or another company the company which has done the three year weathering testing must send documentation stating that the materials, processes and end products are equivalent between itself and the new applicant. Due to industry complaints, the List of Acceptable Plastics has revised the listing to more accurately reflect the test data from various parent companies. ***In addition, if the joint***

***venture is terminated or the manufacturing facility is sold, the subsidiary or joint company must be able to provide weathering test data on its own. A company can no longer rely on the parent company data and processes if they have no relationship to the parent company who conducted the original testing.***

## **8. NOTE ON SUBMITTING FOR ADDITIONAL COLORS**

If you plan to add an additional color number to your listing, please list the existing colors which have undergone the three year weathering that are a greater and lesser concentration. The colors listed MUST be in the same color space.

## **9. Note on Inner Lens Testing**

Currently SAE has issued no guidelines for inner lenses. If and when they do, they will be the requirements that everyone must follow. In the meantime, we would recommend for following guidelines for inner lens test setup.

- 1) You must bracket test every color combination (light/dark) you want to use—red, blue, amber, etc. The light/dark colors must be in the same color space.
- 2) You must bracket test molecular weight (heavy/light) for both outer lens and inner lens.
- 3) The test setup—airspace, ventilation, should duplicate as close as possible the conditions in an inner automotive lens including factors such as ventilation, spacing between inner and outer lens and coatings.
- 4) For more information, please see SAE Paper: <http://papers.sae.org/2004-01-0800>

Inner lens materials will be listed as a system. Both the inner lens and outer lens material/color will be listed *together*. If you only test a limited range of lens colors, thicknesses or materials that is how they will be listed.

## **10. Special Note on the definition of “Protected Inner Lens” and/or “Protected Applications”**

**Protected Inner Lenses or Protected Applications for polycarbonate lenses refers to an outer lens which has a UV absorbing capabilities. NOT physical protection but UV protection.**

## Frequently Asked Questions

Q1) If someone else has weathered a polycarbonate/PMMA material, do I have to weather my polycarbonate/PMMA material?

A) Yes, every company's material stands independently from what another company has done. Each coating, pigment and additive must be tested with each company's own material. Each separate material stands alone for weathering performance unless bracketed by materials of higher and lower concentrations or molecular weights.

Q2) If someone else has weathered a pigment with another plastic do I have to weather the pigment with my plastic?

A) Yes, every company's material stands independently from what another company has done. Each coating, pigment and additive must be tested with each company's own material. Each separate material stands alone for weathering performance unless bracketed by materials of higher and lower concentrations or molecular weights.

Q3) If someone else has weathered a coating do I have to weather my material with that coating?

A) Yes, every company's material stands independently from what another company has done. Each coating, pigment and additive must be tested with each company's own material. Each separate material stands alone for weathering performance unless bracketed by materials of higher and lower concentrations or molecular weights.

Q4) How many thicknesses do I have to test?

A) SAE 576:  $1.6 \pm 0.25$  mm,  $2.3 \pm 0.25$  mm,  $3.2 \pm 0.25$  mm, and  $6.4 \pm 0.25$  mm.

Q5) Even if it's for a coating?

A) Yes.

Q6) Do materials have to meet the color requirements before testing?

A) Yes: Samples for the thicknesses specified by the manufacturer must conform to the applicable color test requirement of this standard prior to testing. If no special thicknesses apply, then all 4 used by SAE J576 must comply.

Testing outline. Note, we also recommend you send DOUBLE samples to prevent any errors.

- ▶ 4 Thicknesses
  - For each colour
  - For each coating
  - For each molecular weight (MW)
- ▶ For example:
  - 4 thickness samples of dark red, uncoated, Lowest MW
  - 4 thickness samples of light red, uncoated, Lowest MW
  - 4 thickness samples of dark red, uncoated, Highest MW
  - 4 thickness samples of light red, uncoated, Highest MW
  
  - 4 thickness samples of dark red, coating 1, Lowest MW
  - 4 thickness samples of light red, coating 1, Lowest MW
  - 4 thickness samples of dark red, coating 1, Highest MW
  - 4 thickness samples of light red, coating 1, Highest MW
  
  - Now repeat for clear, yellow, blue, coating 2 & coating 3

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<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
Asahi Kasei Corporation  <a href="http://www.asahi-kasei.co.jp">www.asahi-kasei.co.jp</a>	80N	Polymethyl Methacrylate	KML1069	White
			KML1070	White
			KML1071	White
			KML1090	White
			KML1091	White
			NS00165	Clear
			NS00178	Clear

**MFR.**                      **Polymer Base**                      **PRODUCT NAME**                      **COLOUR-CODE**



Covestro Deutschland AG (Europe)  
 Covestro LLC (America)  
 Covestro (Hong Kong) Limited (Asia Pacific)  
[www.covestro.com](http://www.covestro.com)

Makrofol® LM228

Makrofol® LM228 in 300/500 micron thickness diffusive film and molded sheets protected by Makrolon® AL2647 with Momentive Performance Materials Inc. UVHC3000K

Makrofol® LM228 in 300/500 micron thickness diffusive film and molded sheets protected by Makrolon® AL 2647 with Momentive Performance Materials Inc. PHC 587C

Makrofol® LM228 in 300/500 micron thickness diffusive film and molded sheets protected by Evonik 8N  
 Makrofol® LM228 molded sheets protected by behind Evonik 8N



Covestro Deutschland AG (Europe)  
 Covestro LLC (America)  
 Covestro (Hong Kong) Limited (Asia Pacific)  
[www.covestro.com](http://www.covestro.com)

Makrolon® 2405	Polycarbonate	021471	White
Makrolon® 2407	Protected Applications Only	021531	White
Makrolon® LED2245	Approved Color Codes	021532	White
Makrolon® LED2247		021533	White
		021688	White

Makrolon® LED2245DQ	Polycarbonate	028335	White
	Protected Applications Only	029335	White
	Approved Color Codes		

Makrolon® LED2245EL	Polycarbonate	021754	White
	Edge-Lighting Product Grades	021760	White
	Protected Applications Only	021767	White
		021769	White

Note: Makrolon® LED2245EL may not be used as a reflex reflector.  
 Makrolon® LED2245EL is considered a diffused material above 3.2 mm when behind PMMA,  
 and above 6.4 mm when behind polycarbonate.

Note: All Covestro inner lens products are tested behind clear coated 2.3mm Makrolon AL 2647

Makrolon 2407 in diffusive colors listed is protected by Makrolon®AL2647 with Momentive Performance Materials Inc. PHC587.

**Coating in Alphabetical Order and Corresponding Manufacturer**

PHC587: See Momentive Performance Materials, Inc.

**MFR.**

**Polymer Base**

**PRODUCT NAME**

**COLOUR-CODE**

**Coating Manufacturer in Alphabetical Order**



Information on PHC 587C hard coat may be obtained by writing to the following:

Momentive Performance Materials GmbH  
Building V7  
51368 Lverkusen  
Germany

Momentive Performance Materials Inc.  
260 Hudson River Road  
Waterford, NY 12118  
[www.momentive.com](http://www.momentive.com)

<u>MFR.</u>	<u>Polymer Base</u>	<u>PRODUCT NAME</u>	<u>COLOUR-CODE</u>	
LXMMA CORP. <a href="http://www.lxmma.com">www.lxmma.com</a> Formerly LGMMA Corproation	Polymethyl Methacrylate	HI835MS	ID59	Diffusion
		IH830C	ID68	Diffusion
		IH830HR	ID88	Diffusion
			ID178	Diffusion
			ID188	Diffusion
			ID193	Diffusion
			ID195	Diffusion
			ID198	Diffusion
			ID1558	Diffusion

Color ID59 is available on HI835MS from 1.6 mm to 3.2 mm only  
Color ID59 is available on IH830C from 1.6 mm to 3.2mm only  
Color ID88 is available on HI835MS from 1.6 mm to 3.2 mm only  
Color ID88 is available on IH830C from 1.6 mm to 3.2 mm only

Material HI835MS is available in colors ID68, ID178, ID188, ID193, ID195 ID198, ID1558, and ID1559 in all thicknesses  
Material IH830C is available in colors ID1559 in all thicknesses  
Material IH830C is available with colors ID68, ID178, ID188, ID193, ID195 ID198, and ID1558 in 3.2 mm only  
Material IH830HR is not available in Color ID193 in any thickness

**MFR.**

**Polymer Base**

**PRODUCT NAME**

**COLOUR-CODE**

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**MOCOM**

MOCOM Compounds  
GmbH & Co. KG

[www.mocom.eu](http://www.mocom.eu)

Polycarbonate Alcom PC 740/4 UV

CC1320-08LG Clear/  
light scattering  
CC1321-08LG Clear/  
light scattering  
CC1322-08LG Clear/  
light scattering  
CC1323-08LG Clear/  
light scattering  
RD1123-05 LD Red, diffusive

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Alcom LG PC 1000 UV 14094 CC1323-08 Clear/  
light scattering

Note:

All Mocom inner lens products are tested behind clear 2.0 mm Makrolon GP 099 coated with protective Momentive Performance Materials Inc. PHC 587.

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**MFR.****Polymer Base****PRODUCT NAME****COLOUR-CODE****RÖHM**TRADITIONALLY  
INNOVATIVERoehm America LLC  
Röhm GmbH  
Roehm Chemical  
(Shanghai) Co., Ltd[www.roehm.com](http://www.roehm.com)[www.acrylite-](http://www.acrylite-)[polymers.com](http://polymers.com)[www.Plexiglas.de](http://www.Plexiglas.de)

PMMA ACRYLITE®/ PLEXIGLAS® <b>Softlight</b> Unmodified base resin	8N df20	<b>Clear</b>
	8N df21	--
	8N df22	000
	8N df23	001
		9V913
	8N df42	
	8N df43	<b>Neutral</b>
	8N df44	543A
	8N df46	
	8N df47	<b>Yellow</b>
	13025	
	23085	
	1V400	
	2V404	
PMMA ACRYLITE®/ PLEXIGLAS® <b>Softlight</b> Impact modified grades	AG100 df20	<b>Amber</b>
	AG100 df21	23340
	AG100 df22	23095
	AG100 df23	23335
		13115
	AG100 df42	23105
	AG100 df43	2V401
	AG100 df44	115
	AG100 df46	
	AG100 df47	<b>Red</b>
		3V137
		3V136
		3V126
		3V125
		33661
	33681	
	33780(901)	
	33721	
	33711	
	33701	
	33691	
	3V401	
	3V402	
	3V403	
	3V408	
	<b>Green</b>	
	65122	
	65542	
	<b>Gray</b>	
	7V274	
	7V275	
	7V273	
	7V271	
	7V272	
	7V270	
	7V269	
	7V268	
	7V265	
	7V205	
	7V336	
	7V337	
	7V338	
	7V244	
	75451	
	77670	

Note: 7V336, 7V338 and 7V337 are listed from 1.6 to 3.2 mm only

<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
Sumitomo Chemical Co., Ltd. <a href="http://www.sumitomo-chem.co.jp">www.sumitomo-chem.co.jp</a>	SUMIPEX F10	Polymethyl Methacrylate	011	White

<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
Teijin Limited	PANLITE ML-2200 PANLITE ML-2205	Polycarbonate		Clear

[www.teijin.co.jp](http://www.teijin.co.jp)

Note: Only 1.6mm thickness was tested.



<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
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Trinseo Inc.	ALTUGLAS™(Or PLEXIGLAS™)	Polymethyl Methacrylate		Colorless/Clear
Altuglas Division	ALTUGLAS™ R-Life		58102	White
Altuglas S.r.l. (Italy)	PLEXIGLAS™ R-Life		58200	White
Trinseo Korea Ltd.	V045		58235	White
Altuglas Division	V825		66080	White
<a href="http://www.trinseo.com">www.trinseo.com</a>	V825 CR50		68177	White
<a href="http://www.plexiglas.com">www.plexiglas.com</a>	V920T		616	Red
<a href="http://www.altuglas.com">www.altuglas.com</a>	DR		756	Red
	Diffuse 81		18242	Red
	Diffuse 101		883	Amber
	Diffuse 301		937	Amber
	Diffuse 302			
	Diffuse 502			

V920T is only available in color 68177 white.

PLEXIGLAS™ or ALTUGLAS™ Frosted V045 is only in white 68177

Note: Red 756 is only listed for the thickness 0.177 inches and thicker.

Note: Amber 937 is only listed for thickness 0.125 inches and thinner.

<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
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Appendix A: AMECA Accredited Laboratory Information

Arizona Desert Testing  
21212 West Patton Road  
Wittman, Arizona 85361  
**Tel:** (623) 388-9500  
**FAX:** (623) 388-9007  
**Website:** [www.aztest.com](http://www.aztest.com)

Atlas Weathering Services Group  
DSET Laboratories  
45601 N. 47th Avenue  
Phoenix, Arizona 85027-7042  
**Tel:** (623) 465-7356; (800) 255-DSET  
**FAX:** (623) 465-9409  
**Website:** [www.atlas-mts.com](http://www.atlas-mts.com)

Atlas Weathering Services Group  
South Florida Test Services Everglades Division  
16100 S.W. 216th Street  
Miami, Florida 33170  
**Tel:** (305) 245-3659  
**FAX:** (305) 245-9122  
**Website:** [www.atlas-mts.com](http://www.atlas-mts.com)

Q-Lab Arizona Test Services  
24742 West Durango Street  
Buckeye, Arizona 85326  
**Tel:** (623) 386-5140  
**FAX:** (623) 386-5143  
**Website:** [www.q-lab.com](http://www.q-lab.com)

Q-Lab Florida Test Services and  
1005 S.W. 18th Avenue, P.O.  
Box 349490  
Homestead, Florida 33034  
**Tel:** (305) 245-5600  
**FAX:** (305) 245-5656  
**Website:** [www.q-lab.com](http://www.q-lab.com)

<u>MFR.</u>	<u>TRADE NAME AND FLOW FORMULATION</u>	<u>TYPE OF RESIN</u>	<u>NUMBER</u>	<u>COLOR</u>
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Appendix B: Supplemental Lab Information