AMECA

5 Year Duration

List of Acceptable Plastics for Optical Lenses and Reflex Reflectors Used on Motor Vehicles

August 28, 2026



5 Year Duration

List of Acceptable Plastics for

Optical Lenses and Reflex Reflectors

Used on Motor Vehicles

August 28, 2026 Edition

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

www.ameca.org

1. STATUS

The following materials have been accepted by the Automotive Manufacturers Equipment Compliance Agency as meeting the 5-year version of the weathering test of FMVSS 108 for plastics used in optical lenses and reflectors 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.

Please contact the manufacturer directly for more information.

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. MATERIAL COATINGS and HAZE

When these materials are used for state/provincial regulated lighting device lenses, the applicable state/provincial regulations shall be met.

The Code "&" denotes material which must be coated to pass the 5 year weathering.

4. DISTRIBUTION

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

5. 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 J1647

6. NOTE ON COLOR

The colors listed have been determined to be in compliance with SAE J-578 using the ASTM E 308-66 method required by FMVSS 108 or in thicknesses specified by the resin manufacturer

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 dramatically 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.**

7. NOTE ON INNER LENS COLOR

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

8. 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 FIVE 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.***

9. 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 FIVE year weathering that are a greater and lesser concentration. The colors listed MUST be in the same color space. FMVSS 108 S14.4.2.2.2

10. Note on Inner Lens Testing

Only inner and outer lens materials, tested together, may be registered for an inner lens system. Not every manufacturer's materials will qualify for the outer lens. Other manufacturers lens material may NOT be used as an outer lens even if those materials have successfully been used as an outer lens for a different material. The inner lens/coating and outer lens/coating must be tested *together as a system*.

Currently the DOT 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 materils will be listed with their outer lens material jointly as a system. Both the inner lens and outer lens material/color will be listed with both materials specified. If you only test a limited range of lens colors, thicknesses or materials that is how they will be listed.

11. 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) Testing laboratories typically use a 1-10 numbering scale according to ASTM D660 to indicate the degree of crazing, cracking or delamination associated with weathering. What numerical value from ASTM D660 is acceptable for listing?

A) FMVSS 108 does not refer to any numerical values from ASTM D660. The numerical values are done by the test laboratory for manufacture convenience. Sections from FMVSS 108 are below.

B)

S14.4.2.2.4.2 After completion of the outdoor exposure test materials used for headlamp lenses must show no deterioration.

S14.4.2.2.4.3 After completion of the outdoor exposure test all materials, when compared with the unexposed control samples, must not show physical changes affecting performance such as color bleeding, delamination, crazing, or cracking. ***Additionally materials used for reflex reflectors and lenses used in front of reflex reflectors must not show surface deterioration or dimensional changes.***

Your tested samples must not show any changes affecting performance. The only value which shows no change is a numerical value of 10.

Q5) How many thicknesses to I have to test?

A) FMVSS 108: S14.4.2.1.3 Samples must be furnished in thicknesses of 1.6 ± 0.25 mm, 2.3 ± 0.25 mm, 3.2 ± 0.25 mm, and 6.4 ± 0.25 mm.

Q6) Even if it's for a coating?

A) Yes.

Q7) Do materials have to meet the color requirements before testing?

A) Yes: S14.4.2.1.4 All samples must conform to the applicable color test requirement of this standard prior to testing.

Q8) What about the plastics used in non-FMVSS applications such as emergency vehicle lighting which also require three year weathering?

A) Yes, those can be listed with non-standard colors as long as they are NOT used on FMVSS 108 lighting devices.

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

AMECA 5 Year Duration
List of Acceptable Plastics for Optical Lenses and Reflex Reflectors

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Listing of Coating Suppliers

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Chugoku Marine Paints, Ltd., 11, 20, 23, 28, 31, 34, 37, 40, 43, 46, 49, 52, 54, 56, 58
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KCC Corporation, 12, 16, 18, 28, 31, 34, 37, 40, 43, 46, 49, 51, 53, 55, 57
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Momentive Performance Materials Inc., 12, 21, 24, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 55, 57, 59
Red Spot Paint & Varnish Co., Inc., 12, 16, 29, 32, 35, 38, 41, 44, 47, 50, 61
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Stanley Electric Co., Ltd., 13, 15, 19, 21, 24, 53, 55, 57, 59

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR



Covestro Deutschland AG (Europe)
Covestro LLC (America)
Covestro (Hong Kong) Limited (Asia Pacific)
www.covestro.com

MAKROLON AL2447	POLYCARBONATE	550012	Clear &
Makrolon® AL2447 MAS402		550396	Clear &
MAKROLON AL2447 RE		550660	Clear &
MAKROLON AL2447 RP(XX) CQ		550674	Clear &
MAKROLON AL2647		551013	Clear &
MAKROLON AL2647 RE		551019	Clear &
MAKROLON AL2647 RP(XX) CQ		551068	Clear &
(coated only)		551070	Clear &
		551104	Clear &
		550207	Clear &

Coated Covestro Deutschland AG (Europe), Covestro LLC (America) and Covestro (Hong Kong) Limited (Asia Pacific) Makrolon AL plasics may only be treated with the following acceptable coatings applied to the molded lens:

Note: Color 550674 are available on AL2647 only
Color 551013 is available on AL2447 only

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A, Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3401U, FUJIHARD HH3482U : See Fujikura Kasei Co., Ltd.

KUV-4000, KUV-5000, KUV-6000: See KCC Corporation

PHOLUCID 115C, PHOLUCID 130C and PHOLUCID 180C: See Chugoku Marine Paints

RayGloss 402: See BASF Coatings GmbH

SHP470FT/AS4700: See Momentive Performance Materials.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

(Coating information continued on the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: All Raygloss data submitted by BASF
Note: BASF RayGloss 402 were tested on 2447 and 2647 clear only

Information on PHOLUCID 115C, PHOLUCID 130C and PHOLUCID 180C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: All PHOLUCID test data submitted by Chugoku Marine Paints.
Note: PHOLUCID 115C, PHOLUCID 130C was tested on Makrolon AL2447 and AL 2647 clear only.
Note: PHOLUCID 180C was tested on Makrolon AL 2447 clear only.

Information on Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A, and PH-930 coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: All Covestro 5 year weathering data submitted by Mitsubishi Chemical Corporation
Note: Acryking PH-710 was tested on AL-2647 clear color only.
Note: Acryking PH-720 was tested on AL-2447 color 551070 only.
Note: Acryking PH-800, Acryking PH-800N5A and PH-930 was tested on AL-2447 and AL-2647 clear color only.

(Coating information continued on the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on KUV-4000, KUV-5000, KUV-6000 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: All Covestro 5 year weathering data submitted by KCC Corporation
Note: KUV-4000, KUV-5000 was tested on AL2447 and AL2647 clear only.
Note: KUV-6000 was tested on AL2647 clear only

Information on FUJIHARD HH2540U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: All Covestro 5 year weathering data submitted by Fujikura Kasei Co., Ltd.
Note: FUJIHARD HH2540U, FUJIHARD HH3401U and Fujihard HH3482U was tested on AL2447 and AL2647 clear only.

Information on SHP470FT/AS4700, UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: All Covestro 5 year weathering data submitted by Momentive Performance Materials except for Makrolon® AL2447 MAS402.
Note: UVHC5000 was tested on AL2447, Makrolon® AL2447 MAS402, and AL2647 clear only.
Note: SHP470FT/AS4700 was tested on AL2447 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: All Covestro 5 year weathering data submitted by Red Spot Paint & Varnish Co., Inc.
Note: UVT820 series coatings were tested on AL2447 clear only

(Coating information continued on the next page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: All 5 year data submitted by Stanley Electric Co., Ltd.
Note: SH-61 was tested on Covestro AL2447

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Formosa Idemitsu Petrochemical Corp..	TARFLON IV1900R TARFLON IV2200R (coated applications only)	Polycarbonate		Clear &

www.ipc.idemitsu.co.jp

Coated Formosa Idemitsu Petrochemical Corp. plastics may only be used when treated with the following acceptable coating applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-800 and Acryking PH-800N5A: See Mitsubishi Chemical Corporation

Coating Manufacturer in Alphabetical Order

MITSUBISHI CHEMICAL GROUP

Information on Acryking PH-800 and Acryking PH-800N5A coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
LG Chem, Ltd.	PC1303AH-22 W10T (coated applications only)	Polycarbonate		Clear &

www.lgchem.com

Coated LG Chem Ltd. plastics are listed with only the following coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

SH-42, and SH-51: See Stanley Electric

Coating Manufacturer in Alphabetical Order

Information on Stanley Electric SH-42, and SH-51, may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Lotte Chemical Corp. www.lottechem.com	LT-1100 LT-1220 (Coated Only)	Polycarbonate		Clear &

Coated Lotte Chemical Corp. plastics are only acceptable with the coatings listed below when properly applied to the molded lens.

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-800 and Acryking PH-800N5A: See Mitsubishi Chemical Corporation

KUV 5000: See KCC Corporation

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

Coating Manufacturer in Alphabetical Order

Information on KUV-5000 coating may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 was tested on LT-1220 clear only.

Information on Acryking PH-800 and Acryking PH-800N5A coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Lotte Chemical Corp. plastics are only to be used in a production process approved and monitored by Mitsubishi Chemical Corporation

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LT-1100 and LT-1220 Clear

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Lotte Chemical Corp.	PC-1000L (Coated Only)	Polycarbonate		Clear &

www.lottechem.com

Coated Lotte Chemical Corp. plastics are only acceptable with the coatings listed below when properly applied to the molded lens.

Coating in Alphabetical Order and Corresponding Manufacturer

KUV-5000: See KCC Corporation

Coating Manufacturer in Alphabetical Order

Information on KUV-5000 coating may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 was tested on PC-1000L clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Mitsubishi Chemical Corporation	ACRYPET VH	Polymethyl Methacrylate	001	Clear

www.m-chemical.co.jp

Coated Mitsubishi Chemical Corp. plastics are only acceptable with the coatings listed below when properly applied to the molded lens.

Coating in Alphabetical Order and Corresponding Manufacturer

SH-61: See Stanley Electric Co

Coating Manufacturer in Alphabetical Order

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Mitsubishi Engineering Plastics Corp.	IUPILON ML-300 IUPILON ML-300AH (Coated Only)	POLYCARBONATE	001	Clear &

www.m-ep.co.jp

Coated Mitsubishi Engineering Plastics Corp. Iupilon plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

PHOLUCID 180C and 185C: See Chugoku Marine Paints, Ltd.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU

Information on PHOLUCID 180C and 185C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C and 185C was tested on Clear IUPILON ML-300AH only.

FUJIKURA KASEI

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing
Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on Clear IUPILON ML-300 and IUPILON ML-350 only

(Coating information continued on the next page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251 Japan
www.m-chemical.co.jp

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 series coatings were tested on Clear IUPILON ML-300AH only.

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on ML-300

Mitsubishi Engineering Plastics Corp.	IUPILON ML-350 (Coated Only)	POLYCARBONATE	001	Clear &

www.m-ep.co.jp

Coated Mitsubishi Engineering Plastics Corp. Iupilon ML-350 plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

Coating Manufacturer in Alphabetical Order

(Coating information continued on the next page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR



Information on FUJIHARD HH3372U and FUJIHARD HH3401U coating may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on Clear IUPILON ML-300 and IUPILON ML-350 only

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Mitsubishi Gas Chemical Engineering-Plastics (Shanghai) Co. Ltd.	IUPILON ML-300 IUPILON ML-300AH (Coated Only)	POLYCARBONATE	001	Clear &

www.m-ep.co.jp

Coated Mitsubishi Gas Chemical Engineering Plastics (Shanghai) Co. Ltd. Iupilon ML-300 plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

PHOLUCID 180C and PHOLUCID 185C: See Chugoku Marine Paints, Ltd.

SH-60: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU

Information on PHOLUCID 180C and PHOLUCID 185C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C and PHOLUCID 185C were tested on Clear IUPILON ML-300AH only.

(Coating information continued on the next page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on FUJIHARD HH2540U and FUJIHARD HH3372U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on clear IUPILON ML-300 and ML-350 only

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 series coatings were tested on Clear IUPILON ML-300AH only.

Information on Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on ML-300

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Mitsubishi Gas Chemical Engineering-Plastics (Shanghai) Co. Ltd. www.m-ep.co.jp	IUPILON ML-350 (Coated Only)	POLYCARBONATE	001	Clear &

Coated Mitsubishi Gas Chemical Engineering Plastics (Shanghai) Co. Ltd. Iupilon ML-350 plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on Clear IUPILON ML-300 and IUPILON ML-350 only

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Roehm America LLC Röhm GmbH Roehm Chemical. (Shanghai) Co., Ltd	PLEXIGLAS® Resist AG100 PLEXIGLAS® Resist AG100 L02 ACRYLITE® Resist AG100 ACRYLITE® Resist AG100 L02	Polymethyl Methacrylate	9V913	Clear Clear

www.acrylite-polymers.com
www.roehm.com
www.Plexiglas.de

Note: Röhm 5 year materials *do not* need to be coated unless used as a réflex reflector or in front of a réflex reflector in thickness above 6.4mm

Note: Röhm 5 year materials over 6.4mm and used as a réflex reflector or in front of a réflex reflector are only listed as coated with PHC XH100P

Coating in Alphabetical Order and Corresponding Manufacturer

PHC XH100P: See Momentive Peformance Materials.

Coating Manufacturer in Alphabetical Order

Information on PHC XH100P hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC USA	LEXAN® LS1 LEXAN® LS2 (Coated Only)	POLYCARBONATE	111 111S	White & White &

www.sabic.com

Coated SABIC USA plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800 Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000, and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A, Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720, Acryking PH-800 and Acryking PH-800N5A was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC Brazil	LEXAN® LS1 LEXAN® LS2 (Coated Only)	POLYCARBONATE	111 111S	White & White &

www.sabic.com

Coated SABIC Brazil plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000, and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A, and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 Acryking PH-800 and Acryking PH-800N5A was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION		TYPE OF RESIN	NUMBER	COLOR
	SABIC Chongqing China	LEXAN® LS1	POLYCARBONATE	111	White &
		LEXAN® LS2		111HX	White &
		(Coated Only)		111H	White &
	www.sabic.com				

Coated SABIC Chongqing, China plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000, and KUV-9100: See KCC Corporation

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order



Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC Europe	LEXAN® LS1	POLYCARBONATE	111	White &
	LEXAN® LS2		111H	White &
	(Coated Only)		111HX	White &
	www.sabic.com			

Coated SABIC Europe plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000 and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION		TYPE OF RESIN	NUMBER	COLOR
SABIC Japan	LEXAN® LS1		POLYCARBONATE	111	White &
	LEXAN® LS2 (Coated Only)			111S	White &

www.sabic.com

Coated SABIC Japan plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000, and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC India www.sabic.com	LEXAN® LS1 LEXAN® LS2 (Coated Only)	POLYCARBONATE	111	White &

Coated SABIC India plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000 and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, and UVHC5000K1: See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U, and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued on the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, and UVHC5000K1 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC Korea	LEXAN® LS1 LEXAN® LS2 (Coated Only)	POLYCARBONATE	111 111S	White & White &

www.sabic.com

Coated SABIC Korea plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000 and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 : See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd.

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:
Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
SABIC Nansha China	LEXAN® LS1	POLYCARBONATE	111	White &
	LEXAN® LS2		111S	White &
	(Coated Only)		111HX	White &
			111X	White &
	www.sabic.com			

Coated SABIC Nansha, China plastics may only be treated with the following acceptable coatings applied to the molded lens:

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000, KUV-6000, and KUV-9100: See KCC Corporation

RayGloss 402: See BASF Coatings GmbH

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 : See Momentive Performance Materials.

UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8: See Red Spot

PHOLUCID 130C: See Chugoku Marine Paints

X-48-5500-A18: See Shin-Etsu Chemical Co., Ltd

Coating Manufacturer in Alphabetical Order

Information on RayGloss 402 coatings may be obtained by writing:

BASF Coatings GmbH
ECO/DT - C422
D-48165 Muenster
Germany
www.basf-coatings.com

Note: BASF RayGloss 402 were tested on LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on PHOLUCID 130C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 130C was tested on Sabic LS1 clear only.

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on LS2 111S Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on LS1-111 and LS2-111 Clear Only.

Information on KUV-5000, KUV-6000 and KUV-9100 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000, and KUV-9100 was tested on SABIC LS1-111 and SABIC LS2-111 clear only.

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: Acryking PH-710, Acryking PH-720 and Acryking PH-800 was tested on SABIC LS1-111 only.
Acryking PH-720 and PH-800 was tested on SABIC LS2-111 only.
Acryking PH-930 was tested on SABIC LS1 and LS2 clear only

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on SABIC LS1 and LS2 clear only.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on LS1-111/LS2-111 Clear only

Information of X-48-5500-A18 hard coat may be obtained by writing to the following address:

Shin-Etsu Chemical Co., Ltd.
4-1, Marunouchi 1-Chome
Chiyoda-ku, Tokyo 100-0005,
Japan
www.shinetsu.co.jp

Note: X-48-5500-A18 was tested on SABIC LS1-111, 111J and 111H clear only.

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Sam Yang Corporation	TRIREX 3022L1 (Coated Only)	POLYCARBONATE	100	Clear &

www.samyang.com

Coated Sam Yang Corporation plastics are only acceptable with the coatings listed below when properly applied to the molded lens.

Coating in Alphabetical Order and Corresponding Manufacturer

KUV-4000, KUV-5000 and KUV-9100: See KCC Corporation

Coating Manufacturer in Alphabetical Order

Information on KUV-4000, KUV-5000 and KUV-9100 coating may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Teijin Limited www.teijin.co.jp	Panlite L-1225Z Panlite L-1225ZA (Coated Only)	POLYCARBONATE	100 100M	Clear & Clear &

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750 Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000: See KCC Corporation

PHOLUCID 180C: See Chugoku Marine Paints, Ltd.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, and UVHC5000K1: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU Information on PHOLUCID 180C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C was tested on Clear Panlite L1225ZA only.

FUJIKURA KASEI

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on PANLITE L1225Z 100M Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on PANLITE L1225Z 100 Clear Only.

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on KUV-5000 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 was tested on Panlite L-1225Z clear only.

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750 Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: All Acryking coatings were tested on clear L-1225Z and L-1225ZA

Information on UVHC5000, UVHC5000K, and UVHC5000K1 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 series was tested on L-1225Z clear only.

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on Panlite L-1225Z 100-M

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Teijin Polycarbonate China Ltd.	Panlite L-1225Z Panlite L-1225ZA (Coated Only)	POLYCARBONATE	100 100M	Clear & Clear &

www.teijin.co.jp

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750 Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000: See KCC Corporation

PHOLUCID 180C: See Chugoku Marine Paints, Ltd.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, and UVHC5000K1: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU Information on PHOLUCID 180C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C was tested on Clear Panlite L1225ZA only.

FUJIKURA KASEI

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on PANLITE L1225Z 100M Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on PANLITE L1225Z 100 Clear Only.

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on KUV-5000 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 was tested on Panlite L-1225Z clear only.

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750 Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: All Acryking coatings were tested on clear L-1225Z and L-1225ZA only.

Information on UVHC5000, UVHC5000K, and UVHC5000K1 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on L-1225Z clear only.

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on Panlite L-1225Z 100-M

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Teijin Polycarbonate Singapore PTE Ltd.	Panlite L-1225Z Panlite L-1225ZA (Coated Only)	POLYCARBONATE	100 100M	Clear & Clear &

www.teijin.co.jp

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH2540U, FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

KUV-5000: See KCC Corporation

PHOLUCID 180C: See Chugoku Marine Paints, Ltd.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, and UVHC5000K1: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU Information on PHOLUCID 180C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C was tested on Clear Panlite L1225ZA only.

FUJIKURA KASEI

Information on FUJIHARD HH2540U, FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH2540U was tested on PANLITE L1225Z 100M Clear Only.
Note: FUJIHARD HH3372U and FUJIHARD HH3401U were tested on PANLITE L1225Z 100 Clear Only.

(Coating information continued the next page)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on KUV-5000 coatings may be obtained by writing:

KCC Corporation
83 Mabook-Dong, Giheung-Gu, Yongin-Si
Gyunggi-Do, South Korea
www.kccworld.co.kr

Note: KUV-5000 was tested on Panlite L-1225Z clear only.

Acryking PH-511, Acryking PH-710, Acryking PH-720, Acryking PH-750, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following address:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251
Japan
www.m-chemical.co.jp

Note: All Acryking coatings were tested on clear L-1225Z and L-1225ZA only.

Information on UVHC5000, UVHC5000K, and UVHC5000K1 hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 was tested on L-1225Z clear only.

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on Panlite L-1225Z 100-M

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Thai Polycarbonate Co., Ltd. www.tpcc-tpac.com	IUPILON ML-300 IUPILON ML-300AH (Coated Only)	POLYCARBONATE	001	Clear &

Coated Thai Polycarbonate Co., Ltd. Iupilon plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930: See Mitsubishi Chemical Corporation

FUJIHARD HH3372U, FUJIHARD HH3401U: See Fujikura Kasei Co., Ltd.

PHOLUCID 180C and PHOLUCID 185C: See Chugoku Marine Paints, Ltd.

SH-61: See Stanley Electric Co., Ltd.

UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: See Momentive Performance Materials.

Coating Manufacturer in Alphabetical Order

CMP CHUGOKU

Information on PHOLUCID 180C and PHOLUCID 185C coatings may be obtained by writing:

Chugoku Marine Paints, Ltd.
Tokyo Club Building,
2-6, Kasumigaseki 3-Chome
Chiyoda-Ku, Tokyo, 100-0013
Japan
Telephone: 81-3-3506-3971
Facsimile: +81-3-5511-8542
www.cmp.co.jp

Note: PHOLUCID 180C and PHOLUCID 185C was tested on Clear IUPILON ML-300AH only.

FUJIKURA KASEI

Information on FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on Clear IUPILON ML-300 and IUPILON ML-350 only

(Coating Information Continued on Next Page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR

Information on Acryking PH-710, Acryking PH-720, Acryking PH-800, Acryking PH-800N5A and Acryking PH-930 coatings may be obtained by writing to the following company:

Mitsubishi Chemical Corporation
1-1 Marunouchi, 1-Chome
Chiyoda–Ku, Tokyo 100-8251Japan
www.m-chemical.co.jp

Information on UVHC5000, UVHC5000K, UVHC5000K1 and UVHC5000K2: hard coat may be obtained by writing to the following address:

Momentive Performance Materials GmbH
Building V7
51368 Lverkusen
Germany

Momentive Performance Materials Inc.
260 Hudson River Road
Waterford, NY 12118
www.momentive.com

Note: UVHC5000 series coatings were tested on Clear IUPILON ML-300AH only.

Information on Stanley Electric SH-61 may be obtained by writing to the following company:

Stanley Electric Co., Ltd.
2-9-13, Nakameguro,
Meguro-Ku, Tokyo 153
Japan
www.stanley.co.jp

Note: SH-61 was tested on ML-300

Thai Polycarbonate Co., Ltd.	IUPILON ML-350 (Coated Only)	POLYCARBONATE	001	Clear &

www.tpcc-tpac.com

Coated Thai Polycarbonate Co., Ltd. Iupilon ML-350 plastics may only be treated with the following coatings listed below.

Coating in Alphabetical Order and Corresponding Manufacturer

FUJIHARD HH3372U, FUJIHARD HH3401U : See Fujikura Kasei Co., Ltd.

Coating Manufacturer in Alphabetical Order

(Coating Information Continuted on Next Page.)

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR



Information on FUJIHARD HH3372U and FUJIHARD HH3401U coatings may be obtained by writing:

Fujikura Kasei Co., Ltd.
6-15 Shibakeon 2-Chome
Minato-Ku, Tokyo, 105-0011
Japan
www.fkkasei.co.jp

Note: FUJIHARD HH3401U was tested on Clear IUPILON ML-300 and IUPILON ML-350 only

MFR.	TRADE NAME and FLOW FORMULATION	TYPE OF RESIN	NUMBER	COLOR
Wanhua Chemical Group Co., Ltd. No. 59 Chongqing Street YEDA, Yantai, Shandong P. R. China www.whchem.com	ACRYPLAS® HD01	Polymethyl Methacrylate		Clear
Wanhua Chemical Group Co., Ltd. No. 59 Chongqing Street YEDA, Yantai, Shandong P. R. China www.whchem.com	HL6157	Polycarbonate	9103	Clear Q

Wanhua Chemical Group Co., Ltd. polycarbonate plastics are only acceptable with the coatings listed below when properly applied to the molded lens.

Coating in Alphabetical Order and Corresponding Manufacturer

UVT820V Series: See Red Spot.

Coating Manufacturer in Alphabetical Order

RED SPOT PAINT & VARNISH COMPANY, INC.

Information on UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 coatings may be obtained by writing to the following address:

Red Spot Paint & Varnish Co., Inc.
P.O. Box 418
Evansville, IN 47703-0418
www.redspot.com

Note: Red Spot UVT820V1, UVT820V2, UVT820V3, UVT820V4, UVT820V5, UVT820V6, UVT820V7 and UVT820V8 was tested on clear HL6157.

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Appendix A: AMECA Accredited Laboratory Information

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.atlaswsg.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.atlaswsg.com

Q-Lab Arizona Test Services
21212 W Patton Rd,
Wittmann, AZ 85361
Tel: (623) 386-5140
FAX: (623) 386-5143
Website: 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

Appendix B: Federal Standard for Plastics

Definitions in FMVSS 108

Coated materials means 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 Fundamental definitions of color are expressed by Chromaticity Coordinates according to the CIE 1931 Standard Colorimetric System, as described in the CIE 1931 Chromaticity Diagram (incorporated by reference, see § 571.5).

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

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

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

Exposed means material used in lenses or optical devices exposed to direct sunlight as installed on the vehicle.

Excerpts from Section 14 from FMVSS 108

Plastic and Coating Requirements

S14.1.2 Plastic optical materials. All plastic materials used for optical parts such as lenses and reflectors on lamps or reflective devices required or allowed by this standard must conform to the material test requirements of S14.4.2.

S14.1.3 All coatings used on optical materials must have added to their formulations an optical brightener, whose presence is detectable by ultraviolet light, to aid in testing for their presence. Other equivalent industry accepted methods may be used as an alternative.

Color Specifications

S14.4.1 *Color test.* The requirement applies to the overall effective color of light emitted by the device and not to the color of the light from a small area of the lens. It does not apply to any pilot, indicator, or tell-tale lights. The color of the sample device must comply when tested by either the Visual Method or the Tristimulus Method.

S14.4.1.3 *Visual method.*

S14.4.1.3.1 *Visual method procedure.* The color of light from the sample device must be compared visually with the color of the light from a standard. The standard may consist of a filter or limit glass. In the case of white, CIE Source A is used only as a color reference. The chromaticity coordinates of the color standards must be as close as possible to the limits listed. The color of the standard filters is determined spectro-photometrically.

S14.4.1.3.2 *Visual method performance requirements.* The color must comply with the applicable requirement.

S14.4.1.3.2.1 *Red.* Red is not acceptable if it is less saturated (paler), yellower, or bluer than the limit standards.

S14.4.1.3.2.2 *Yellow (Amber).* Yellow is not acceptable if it is less saturated (paler), greener, or redder than the limit standards.

S14.4.1.3.2.3 *White.* White is not acceptable if its color differs materially from that of CIE Source A.

S14.4.1.3.2.4 Green. Green is not acceptable if it is less saturated (paler), yellower, or bluer than the limit standards.

S14.4.1.3.2.5 Blue. Blue is not acceptable if it is less saturated (paler), greener, or redder than the limit standards.

S14.4.1.4 *Tristimulus method.*

S14.4.1.4.1 *Tristimulus method procedure.*

S14.4.1.4.1.1 The color of light from the H–V point of a sample device must be measured by photoelectric receivers with spectral responses that approximate CIE standard spectral tristimulus valves.

S14.4.1.4.1.2 A sphere may be used to integrate light from a colored source provided that the color shift that results from the spectral selectivity of the sphere paint be corrected by the use of a filter, correction factor, or an appropriate calibration.

S14.4.1.4.1.3 Where the sample device does not have uniform spectral characteristics in all useful directions, color measurements must be made at as many directions of view as are required to evaluate the color for those directions that apply to the end use of the device.

S14.4.1.4.2 *Tristimulus method performance requirements.* The color must comply with the applicable requirement.

S14.4.1.4.2.1 *Red.* The color of light emitted must fall within the following boundaries:

y = 0.33 (yellow boundary)

y = 0.98 − x (purple boundary)

S14.4.1.4.2.2 *Yellow (Amber).* The color of light emitted must fall within the following boundaries:

y = 0.39 (red boundary)

y = 0.79 − 0.67x (white boundary)

y = x − 0.12 (green boundary)

S14.4.1.4.2.3 *White (achromatic).* The color of light emitted must fall within the following boundaries:

x = 0.31 (blue boundary)

y = 0.44 (green boundary)

x = 0.50 (yellow boundary)

y = 0.15 + 0.64x (green boundary)

y = 0.38 (red boundary)
y = 0.05 + 0.75x (purple boundary)

S14.4.1.4.2.4 Green. The color of light emitted must fall within the following boundaries:
y = 0.73 − 0.73x (yellow boundary)
x = 0.63y − 0.04 (white boundary)
y = 0.50 − 0.50x (blue boundary)

S14.4.1.4.2.5 Restricted Blue. The color of light emitted must fall within the following boundaries:
y = 0.07 + 0.81x (green boundary)
x = 0.40 − y (white boundary)
x = 0.13 + 0.60y (violet boundary)
S14.4.1.4.2.6 Signal Blue. The color of light emitted must fall within the following boundaries:
y = 0.32 (green boundary)
x = 0.16 (white boundary)
x = 0.40 − y (white boundary)
x = 0.13 + 0.60y (violet boundary)

Plastic optical materials tests

S14.4.2 *Plastic optical materials tests.* Accelerated weathering procedures are not permitted.

S14.4.2.1 *Samples.*
S14.4.2.1.1 Samples of materials shall be injection molded into polished metal molds to produce test specimens with two flat and parallel faces. Alternative techniques may be used to produce equivalent specimens.

S14.4.2.1.2 Test specimens shape may vary, but each exposed surface must contain a minimum uninterrupted area of 32 sq cm.

S14.4.2.1.3 Samples must be furnished in thicknesses of 1.6 +/- 0.25 mm, 2.3 +/- 0.25 mm, 3.2 +/- 0.25 mm, and 6.4 +/- 0.25 mm. S14.4.2.1.4 All samples must conform to the applicable color test requirement of this standard prior to testing.

S14.4.2.1.5 A control sample, kept properly protected from influences which may change its appearance and properties of each thickness, must be retained.

S14.4.2.2 *Outdoor exposure test.*
S14.4.2.2.1 Outdoor exposure tests of 3 years in duration must be made on samples of all materials, including coated and uncoated versions, used for optical parts of devices covered by this standard. Tests are to be conducted in Florida and Arizona.

S14.4.2.2.2 Concentrations of polymer components and additives used in plastic materials may be changed without outdoor exposure testing provided the changes are within the limits of composition represented by higher and lower concentrations of these polymer components and additives previously tested to this section and found to meet its requirements.

S14.4.2.2.3 Procedure. S14.4.2.2.3.1 One sample of each thickness of each material must be mounted at each exposure site so that at least a minimum uninterrupted area of 32 sq cm of the exposed upper surface of the sample is at an angle of 45 degrees to the horizontal facing south. The sample must be mounted in the open no closer than 30 cm (11.8 in) to its background.

S14.4.2.2.3.2 During the exposure time the samples must be cleaned once every three months by washing with mild soap or detergent and water, and then rinsing with distilled water. Rubbing must be avoided.

S14.4.2.2.4 *Performance requirements.* Plastic lenses, other than those incorporating reflex reflectors, used for inner lenses or those covered by another material and not exposed directly to sunlight must meet the optical material test requirements when covered by the outer lens or other material.

S14.4.2.2.4.1 After completion of the outdoor exposure test the haze and loss of surface luster as measured by ASTM D1003–92 (incorporated by reference, see § 571.5) must not be greater than:
(a) 30% for materials used for outer lenses, other than those incorporating reflex reflectors;
(b) 7% for materials used for reflex reflectors and lenses used in front of reflex reflectors.

S14.4.2.2.4.2 After completion of the outdoor exposure test materials used for headlamp lenses must show no deterioration.

S14.4.2.2.4.3 After completion of the outdoor exposure test all materials, when compared with the unexposed control samples, must not show physical changes affecting performance such as color bleeding, delamination, crazing, or cracking. Additionally materials used for reflex reflectors and lenses used in front of reflex reflectors must not show surface deterioration or dimensional changes.

S14.4.2.2.4.4 After completion of the outdoor exposure test all materials, when compared with the unexposed control samples, must not have their luminous transmittance changed by more than 25% when tested in accordance with ASTM E308–66 (incorporated by reference, see § 571.5) using CIE Illuminant A (2856K). S14.4.2.2.4.5 After completion of the outdoor exposure test all materials must conform to the color test of this standard in the range of thickness stated by the material manufacturer.

S14.4.2.3 *Heat test.*
S14.4.2.3.1 *Procedure.* Two samples of each thickness of each material must be supported at the bottom, with at least 51 mm of the sample above the support, in the vertical position in such a manner that, on each side, the minimum uninterrupted area of exposed surface is not less than 3225 sq mm. The samples are placed in a circulating air oven at 79 Degrees +/- 3 Degrees for Two hours.

S14.4.2.3.2 *Performance requirements.*

After completion of the heat exposure and cooling to room ambient temperature, a test specimen must show no change in shape and general appearance discernable to the naked eye when compared with an unexposed specimen and continue to conform to the applicable color test requirement of this standard.

Appendix C: DOT Interpretation Files and Supplemental Lab Information

420227

NEW FLYER

23 May, 2006

NHTSA-2006-26148-2

The Chief Counsel
National Highway Traffic Safety Administration, NCC-01
400 7th Street, SW
Washington, D.C. 20590

Subject: Interpretation Request - FMVSS 108 & Colored Destination Signs on Transit Buses

To the Chief Counsel:

Recently we had a request from a customer to have a new style of lighted destination signs installed on their upcoming order of transit buses. Previously it was believed that all lights or lighting equipment on the front of the vehicle, had to illuminate within the color spectrum of white to amber. The new signs are capable of red/green/blue and are used for route designation as well as PR messages.

Although I cannot find a specific reference in FMVSS108 indicating that these lighted signs are not allowed due to their color capability, I have seen specific reference to this in the California Vehicle Code.

> "25950. This section applies to the color of lamps and to any reflector exhibiting or reflecting perceptible light of 0.05 candela or more per foot-candle of incident illumination. Unless provided otherwise, the color of lamps and reflectors upon a vehicle shall be as follows:
>
> (a) The emitted light from all lamps and the reflected light from all reflectors, visible from in front of a vehicle, shall be white or yellow, except as follows..."

My question to you is this; are these lighted color signs contrary to FMVSS 108, or, are they only contrary to specific State Statutes?

Sincerely,

Kerry Legg
Safety & Compliance Manager
Customer Service Support

Headquarters/ Winnipeg Facility
711 Kernaghan Avenue
Winnipeg, Manitoba
R2C 3T4 Canada
Ph: (204) 224-1251
Fx: (204) 224-0551
E: bussales@newflyer.com

Customer Services
25 DeBaets Street
Winnipeg, Manitoba
R2J 4G5 Canada
Ph: (204) 982-8400

New Jersey Service Support Center
808 Garfield Avenue
Jersey City, New Jersey
07305-4423 USA
Ph: (201) 369-1200
Fx: (201) 369-0345

New Product Development
Unit 7, 45 Beghin Avenue
Winnipeg, Manitoba
R2J 4B9 Canada
Ph: (204) 982-8413
Fx: (204) 654-4941

Crookston Facility
214 5th Avenue SW
Crookston, Minnesota
56716 USA
Ph: (218) 281-5752
Fx: (218) 281-5672

St. Cloud Facility
6200 Glenn Carlson Drive
St.Cloud, Minnesota
56301 USA
Ph: (320) 203-0576
Fx: (320) 203-0584

www.newflyer.com

4202216

U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

400 Seventh St., S.W.
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Ms. Kerry Legg
Safety & Compliance Manager
New Flyer
25 DeBaets Street
Winnipeg, Manitoba
R2J 4G5 Canada

NHTSA-2002-12148-1

Dear Ms. Legg:

This responds to your letter regarding permissible colors for illuminated destination signs on the front of new transit buses, under Federal Motor Vehicle Safety Standard (FMVSS) No. 108, Lamps, Reflective Devices, and Associated Equipment. You state that a customer has requested installation of signs capable of illuminating route designations and other messages in a variety of colors, including red, green, and blue. You believe that lighting equipment on the front of the vehicle must illuminate within the color spectrum from white to amber, adding that you have seen specific limitations to this effect under California State law. You ask whether such red, green, and blue lighted signs are prohibited under FMVSS No. 108. As explained below, given only the description you offer of the subject lighting system, the answer to your question is yes.

By way of background, the National Highway Traffic Safety Administration (NHTSA) is authorized to issue FMVSSs that set performance requirements for new motor vehicles and items of motor vehicle equipment (see 49 U.S.C. 30111 and 49 CFR Part 571). It is the responsibility of manufacturers to certify that their products conform to all applicable safety standards before they can be offered for sale (see 49 U.S.C. 30115 and 49 CFR Part 567). FMVSS No. 108 sets forth the requirements for both new and replacement motor vehicle lighting equipment.

We note that the agency addressed the issue of color of vehicle lighting equipment in a July 29, 2002 letter of interpretation to Trooper Lawrence Richardson ("Richardson letter," copy enclosed). Our interpretation of FMVSS No. 108 has not changed from the opinion of the Richardson letter.

Under Federal law (*i.e.*, FMVSS No. 108), the only permissible colors of light that may be emitted by original required equipment lighting on new vehicles are red, amber, or white. Furthermore, the standard requires items of replacement equipment to emit the same color light as the original equipment that they are designed to replace.

Accessory equipment (*i.e.*, lighting equipment not required under the standard) is permissible on new vehicles, provided that it does not impair the effectiveness of lighting equipment required by Standard No. 108 (see S5.1.3). We interpret this as a general prohibition on lamps of colors different than red, amber, or white, because of the possibility that non-standard colors could cause confusion in other drivers, thereby diverting their attention from lamps that signal driver intention, such as stop lamps or turn signal lamps.

Turning to the specifics of the issue presented in your letter, we first note that permissible colors for lamps on the front of a bus are limited to amber or white. Use of supplemental red lamps on the front of a vehicle, such as the destination signs to which you refer, could cause confusion with brake or stop lamps. The color green typically conveys the message that one may proceed, so it could cause confusion with other red or yellow lamps that seek to warn or caution. Finally, blue is a color that some States reserve for use on emergency vehicles, so drivers unexpectedly encountering blue lamps on other types of vehicles could take potentially inappropriate actions.

Generally, if certain accessory lighting is not permissible on new vehicles, commercial entities will not be permitted to install the lighting as an aftermarket accessory for vehicles in use. The legal consideration is whether the accessory makes inoperative in any way a lamp required under and installed in accordance with Standard No. 108 (see 49 U.S.C. 30122). Usually, we equate impairing the effectiveness of a required item of lighting equipment with "making inoperative" such equipment in part, a violation of §30122.

Federal law does not prohibit a vehicle owner personally from making any safety equipment inoperative on his or her own vehicle, although the agency strongly discourages disabling any safety system. However, whether non-standard lighting equipment is allowable on vehicles in use is a matter of State law.

Based upon the above analysis and the description offered by you of the subject lighting system, under FMVSS No. 108, a manufacturer of new transit buses would not be permitted to install destination signs on the front of a vehicle that illuminate in red, green, or blue, because the lighting devices in those colors could impair the effectiveness of other frontal lighting equipment required under FMVSS No. 108.

If you have further questions, please feel free to contact Eric Stas of my staff at this address or by telephone at (202) 366-2992.

Sincerely,

Anthony M. Cooke
Chief Counsel

Enclosure

Trooper Lawrence D. Richardson
Massachusetts State Police
200 Scotland Road
Newbury, MA 01950

Dear Trooper Richardson:

This is in reply to your e-mail earlier this year to the National Highway Traffic Safety Administration Webmaster. You are concerned about several motor vehicle lighting devices that you have seen recently on vehicles in your state. These include "red, green, purple, blue and other colors that are mounted in the front or rear of the vehicle," vehicles with clear taillamp lenses, and vehicles with no rear "reflective red lenses." You asked whether these types of devices are allowable.

We do not understand your reference to your motor vehicle law that "refers to part 571 as far as after market lights are concerned." Whether non-standard lighting equipment is allowable on vehicles in use is at bottom a matter of State law. The legality of modifications by vehicle owners is generally determined by laws of the jurisdiction where a vehicle is registered and/or operated. We believe, therefore, that Massachusetts law contains the answers to your questions.

Under Federal law, much of what you have observed would not be permissible as original vehicle equipment. As you realize, motor vehicles are originally manufactured with lighting equipment that emits red, amber, or white light. No other colors are permitted for original equipment lighting by the Federal motor vehicle safety standard on vehicle lighting (49 CFR 571.108, Lamps, Reflective Devices and Associated Equipment) (except that some States reserve blue for use in emergency lighting). Items of replacement lighting equipment are also required under Federal law to emit the same color light as the original equipment they are designed to replace.

Accessory equipment on new vehicles is permissible under Federal law if it does not impair the effectiveness of original equipment required by Standard No. 108. We interpret this as prohibiting lamps of colors different than red, amber, or white, because of the possibility that non-standard colors could cause momentary confusion in other drivers, diverting their attention from lamps that signal driver intention, such as stop lamps and turn signal lamps. This means that we do not allow green, purple, or blue lamps as original equipment on private vehicles. Further, we do not allow red lamps of any sort, or reflectors, to be mounted at a location other than the rear side, or rear, of a vehicle.

Generally, if accessory lighting equipment is not permissible on new vehicles, it will not be permissible as an aftermarket accessory for vehicles in use. The legal consideration in this instance is whether the accessory makes inoperative in any way a lamp installed in accordance with Standard No. 108. Usually, we conclude that, if a device impairs the effectiveness of a required item of lighting equipment, it will also make that equipment inoperative in part. However, our law does not prohibit a vehicle owner personally from making any safety equipment inoperative on his or her vehicle. In that instance, the legality of installation and use is determined under State law.

Some replacement taillamp housings are available with clear lenses, intended to be used in conjunction with a red incandescent light source. We are unaware of any original equipment lamp

required to emit the color red that consists of a clear lens and a red bulb and that is certified to comply with standard No. 108. This is not simply a design choice; we know of no red bulb now or ever in production that conforms to Standard No. 108's color specification. The combination of a clear bulb and a red lens, therefore, is the only way to design a lamp that conforms to Standard No. 108's requirement that its light be red. This means that the manufacturer of clear lenses or lamps intended to replace lenses or lamps whose original color was red is in violation of S5.8 of Standard No. 108. Many of these original equipment taillamps also incorporate the red reflex reflector that Standard No. 108 requires to be located on the rear side and rear of vehicles, whereas the replacements with clear lenses do not. This also does not comport with Standard No. 108. A similar situation exists with respect to headlamps that originally incorporated amber side reflex reflectors. If the replacement lamp does not include the reflector, this, too, would not comport with Standard No. 108.

You also mentioned "snake eyes" lights "that are displayed where the window washer fluid should be coming out, in all different colors," including purple, green, and blue. Such an accessory would appear to have an impairing effect upon original lighting equipment if its colors are other than white or amber (on the front), or red (on the rear), or if the light is of such an intensity as to distract another driver's attention from the light emitted by required lighting equipment.

If you have any questions, you may phone Taylor Vinson of this Office (202-366-5263).

Sincerely,

Jacqueline Glassman
Chief Counsel

ref:108
d.7/29/02

US 20160161642A1

(19) **United States**

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Dellock et al.

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(54) **HARD-COAT INFUSED POLYCARBONATE HEADLAMP LENS AND RELATED METHOD**

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(52) **U.S. Cl.**

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(57) **ABSTRACT**

A headlamp lens includes a polycarbonate substrate and an infused protective skin covering on at least one surface of the polycarbonate substrate.

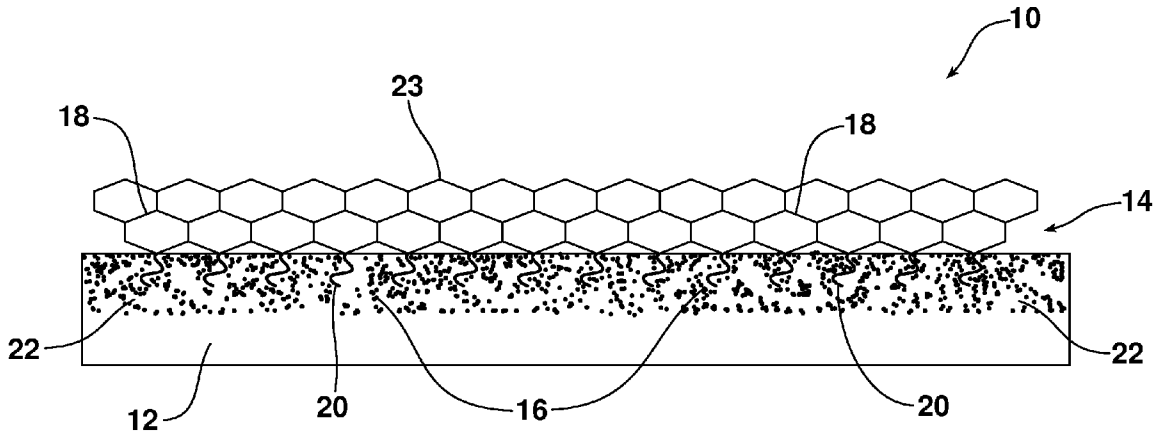
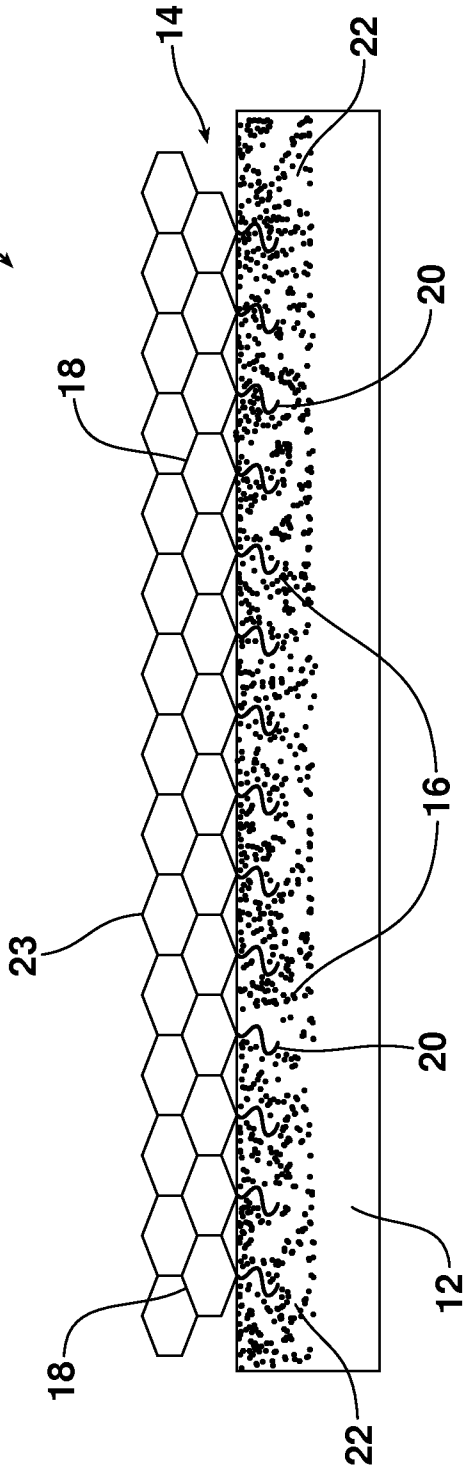


FIG. 1



HARD-COAT INFUSED POLYCARBONATE HEADLAMP LENS AND RELATED METHOD

[0001] This application claims the benefit of U.S. provisional patent application Ser. No. 62/086,965 filed on 3 Dec. 2014, the full disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] This document relates generally to the vehicle equipment field and, more particularly, to a hard-coat infused polycarbonate lens that is less expensive to produce and provides better performance including, particularly, better resistance to UV degradation over time so as to remain clear for the free passage of light for the life of the vehicle.

BACKGROUND

[0003] Currently, headlamp lenses are molded from optically clear polycarbonate. In order to protect the headlamp lenses from both abrasion and ultraviolet (UV) weathering degradation, a clear silica hard-coat and anti-UV additives are applied to the forward surface of the headlamp. Silica hard-coated polycarbonate headlamp lenses provide excellent resistance to scratches and excellent impact performance. However, silica hard-coated polycarbonate headlamp lenses suffer a number of drawbacks.

[0004] More specifically, the silica hard-coating process is very expensive and typically requires large facility expense in order to implement. Further, exposure to UV radiation from the rays of the sun attacks both the coating and the lens base polycarbonate substrate. Current state-of-the-art UV protection lasts up to 3000 hours of accelerated weathering. However, it should be appreciated that many vehicles including, for example, those in the Sun Belt areas of the United States are exposed to substantial UV radiation that, over time, breaks down the substrate leading to yellowing and clouding which reduces headlamp performance. Further, as the UV rays of the sun degrade the substrate, the silica hard-coat may delaminate from the polycarbonate substrate accelerating the substrate degradation. This also leads to degradation of the impact performance of the lens. Still further, the hard-coat process relies upon volatile organic compounds (VOCs) which are an environmental concern.

[0005] This document relates to a new and improved method that provides similar or improved scratch resistance and significantly better UV performance than found in current polycarbonate headlamp lenses. As a result, impact resistance and clarity may be better maintained for the life of the vehicle. Further, the method utilized to provide this increased performance is more affordable than and does not release VOCs into the atmosphere like the prior art process.

SUMMARY

[0006] In accordance with the purposes and benefits described herein, a headlamp lens is provided. That headlamp lens comprises a polycarbonate substrate and an infused protective skin covering at least one surface of the polycarbonate substrate.

[0007] In one possible embodiment, the infused protective skin includes a scratch-resistant agent and a UV inhibitor. In one possible embodiment, the scratch-resistant agent is silicone-based. In one possible embodiment, the scratch-resistant agent is selected from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrialkoxysilanes, and other silicone-based molecules and mixtures thereof.

[0008] In one possible embodiment, the UV inhibitor is selected from a group of materials consisting of benzophenone, a benzotriazole and mixtures thereof. Still further, in one possible embodiment, the infused protective skin further includes a UV stabilizer. In one possible embodiment, that UV stabilizer may be a hindered amine light stabilizer.

[0009] Still further, the polycarbonate substrate in any embodiment may include a plurality of pores. Further, the scratch-resistant agent may comprise silicon-based molecules having relatively large heads and relatively narrow tails wherein the heads rest on a surface of the substrate overlying the pores and the tails penetrate the pores and act as an anchor for the heads.

[0010] In accordance with an additional aspect, a method is provided of manufacturing a polycarbonate headlamp lens with an infused skin providing scratch resistance and UV protection. That method may be described as comprising the steps of molding the headlamp lens substrate from polycarbonate material, cleaning the polycarbonate substrate following molding and infusing a surface of the polycarbonate substrate with a protective skin to produce polycarbonate infused headlamp lenses. This is then followed by rinsing and drying the lenses.

[0011] In one possible embodiment, the method further includes increasing the thickness of the protective skin following infusing. In one possible embodiment, this is done by chemically enhanced physical vapor deposition.

[0012] In one possible embodiment, the method includes incorporating a scratch resistant agent and a UV inhibitor in the protective skin. That scratch resistant agent may be selected from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilanes, other silicone-based molecules and mixtures thereof. Further, the method may include selecting the UV inhibitors from a group of materials consisting of benzophenone, a benzotriazole, other UV inhibitor compounds and mixtures thereof. Further, the method may include incorporating one or more UV stabilizers in the protective skin.

[0013] In one possible embodiment, the method includes cooling the headlamp lens substrate after molding and prior to cleaning to a temperature between 65° C. and room temperature. Further, the method includes infusing by dipping the substrate into an infusion tank including an infusion solution bath for a period of time between 10 to 60 seconds at a temperature between 65-90° C. so as to open pores in the substrate to allow superficial infusion of the protective skin to the substrate. In one possible embodiment, the scratch resistant agent and the UV inhibitor are infused in a single step. In another possible embodiment, the scratch resistant agent and the UV inhibitor are infused in multiple steps for the purposes of building up the desired thickness of the hard coating. In addition, the method may include the step of performing a scratch resistance test to select infused lenses and adjusting the concentration of additives in the infusion solution bath as required until the desired results are achieved.

[0014] In the following description there are shown and described several preferred embodiments of the headlamp lens. As should be realized, the headlamp lens is capable of other, different embodiments and its several details are

capable of modification in various, obvious aspects, all without departing from the headlamp lens as described in the following claims.

[0015] Accordingly, the drawings and descriptions should be regarded as illustrative in nature and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWING FIGURE

[0016] The accompanying drawing figure incorporated herein and forming a part of the specification, illustrates several aspects of the infused headlamp lens and together with the description serves to explain certain principles thereof.

[0017] FIG. **1** is a schematic representation of the polycarbonate lens with an infused protective coating.

[0018] Reference will now be made in detail to the present preferred embodiments of the headlamp lens, an example of which is illustrated in the accompanying drawing figure.

DETAILED DESCRIPTION

[0019] Reference is now made to FIG. **1** illustrating the headlamp lens **10**. That headlamp lens **10** comprises a polycarbonate substrate **12** and an infused protective skin **14** covering at least one surface (i.e. the forward surface) of the polycarbonate substrate and an optional PECVD (Plasma Enhanced Chemical Vapor Deposition) build-up.

[0020] In one embodiment, the infused protective skin **14** includes a scratch resistance agent and a UV inhibitor. In one possible embodiment, the scratch resistance agent is silicone-based. Such a scratch resistance agent may be selected from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilanes, and other silicone-based molecules and mixtures thereof.

[0021] In one embodiment the UV inhibitor is selected from a group of materials consisting of a benzophenone, a benzotriazole, or other compounds like hydroxyphenyltriazines and mixtures thereof. Further, in one possible embodiment the infused protective skin further includes one or more UV stabilizers. The UV stabilizer may take the form of a hindered amine light stabilizer.

[0022] As illustrated in FIG. **1**, in any of the embodiments the polycarbonate substrate **12** includes a plurality of pores **16**. In one possible embodiment, the scratch resistance agent comprises silicone-based molecules having relatively large heads **18** and relatively narrow tails **20** wherein the heads rest on a surface of the substrate **12** overlying the pores **16** so as to provide a hard, impact resistant protective coating while the tails **20** penetrate the pores and act as an anchor for the heads. Advantageously, this structure provides a chemical bond between the infused protective skin **14** and the polycarbonate substrate **12** that is (a) far superior to and (b) resists the delamination characteristic of mechanically bonded hardcoats provided on headlamp lenses made in accordance with methods known in the art. It also serves to seal in the UV inhibitor **22** that has penetrated and been deposited deep in other pores **16**.

[0023] In accordance with an additional aspect, a method is provided for manufacturing a polycarbonate headlamp lens **10** having a polycarbonate substrate **12** and an infused skin **14** providing scratch resistance and UV protection. That method may be broadly described as comprising the steps of molding the headlamp lens substrate **12** from the polycarbonate material, cleaning the polycarbonate substrate following molding, infusing a surface of the polycarbonate substrate with a protective skin **14** and adding an optional PECVD layer **23** to produce an infused headlamp lens **10**, rinsing the lens and drying the lens. The method may also include incorporating a scratch resistance agent and a UV inhibitor in the protective skin **14**. Further, the method may include selecting a scratch resistance agent from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilanes, and other silicone-based molecules and mixtures thereof.

[0024] In addition the method may include the selecting of the UV inhibitor from a group of materials consisting of a benzophenone, a benzotriazole, other compounds like hydroxyphenyltriazines and mixtures thereof. Further the method may include incorporating a UV stabilizer in the protective skin **14**.

[0025] Still more specifically, the method may include cooling the headlamp lens substrate **12** after molding and prior to cleaning to a temperature of between 65° C. and room temperature. Further the infusing step may include dipping the substrate **12** into an infusion tank including an infusion solution bath for a period of time of between 10 to 60 seconds at a temperature between 65-90° C. so as to open the pores **16** in the substrate to allow superficial infusion of the protective skin **14** into the substrate. In one possible embodiment, the scratch resistance agent and the UV inhibitor are infused in a single step. In another possible embodiment, the scratch resistance agent and the UV inhibitor are infused in multiple steps. In another embodiment, the method includes performing a scratch resistance test to selected infused lenses and adjusting the concentrations of additives in the infusion solution bath as required until the desired results are achieved.

[0026] Another embodiment is to increase the depth of the silica layer by using an additional deposition process such as PECVD or other deposition process.

[0027] In yet another embodiment, the thickness of the infused skin may be further increased by appropriate physical or chemical conditioning or both. A potential way of achieving this is by chemically enhanced physical vapor deposition (CEPVD). In this technique, the infused polycarbonate is placed inside a chamber where silica and related silicon-based compounds (precursors) are ionized and vaporized under partial vacuum at moderate or near ambient temperatures and the vapors are allowed to deposit and condense onto the infused polycarbonate. Final hard coating thicknesses are controlled by the selection of the type of precursor and the chamber time/temperature/vacuum pressure to which the polycarbonate is exposed. In one possible embodiment, the thickness of the infused protection skin is between 1 and 10 microns. In another possible embodiment the protective skin has a thickness of about 7 microns. Where CEPVD is used to increase the thickness of the protective skin, the infused silica surface is receptive to chemical bonding and physical binding with the vaporized silica and related silicon-based compounds to provide a hard, scratch resistant layer.

[0028] In one possible embodiment, the polycarbonate headlamp lens substrate may be removed from the molding tool using an overhead conveyor transport. The molded lens may then be cooled to a temperature between 65° C. and room temperature by air circulation or other means prior to cleaning. Cleaning may be completed by dipping the lens **10** into a

tank filled with distilled, deionized water for 10 to 30 seconds. That water is maintained at anywhere from room temperature to 65° C.

[0029] After cleaning, the lens is dipped into an infusion tank holding an infusion solution bath for from 10 to 60 seconds wherein the bath is held at 65 the 90° C. The bath opens the pores **16** in the surface of the substrate **12** to allow superficial infusion of the additives in the infusion solution to a depth of 0.1-10μ or more as desired.

[0030] If the scratch resistance agent and the UV inhibitor are infused in a single step, the infusion solution bath includes an aqueous mixture of surface active agents including ionic and nonionic surfactants (emulsifiers). These surfactants hold two or more immiscible liquids, solids and mixtures in suspension. Proper emulsification is essential to the satisfactory performance of the carrier. Emulsifiers can be ionic (anionic, cationic, and amphoteric) and non-ionic.

[0031] Sodium stearate (a soap)—is an example of an anionic surfactant;

[0032] Trimethylhexadecyl ammonium bromide—is an example of a cationic surfactant;

[0033] Cocoamidopropylbentaine—is an example of an amphoteric surfactant; and

[0034] Polyethylene ethoxylate—is an example of a non-ionic surfactant.

[0035] Additional chemicals in the infusion solution bath may further include ethanol, other solvents, dispersants, plasticizers and leveling agents. If the scratch resistance agent and the UV inhibitor are infused in a single step, the infusion solution bath may further include hard coating materials based on the hard coating formula and the UV protection formula described below. In the event the scratch resistance agent and the UV inhibitor are to be infused in multiple steps, the first infusion path would include either the hard coating formula or the UV protection formula and a second infusion coating bath would include the other of the hard coating formula or UV protection formula.

[0036] For purposes of this document the hard coating formula may be described as comprising a number of silicone-based molecules that are suitable for the hard coating infusion of the polycarbonate lens **12**. As previously noted, these may include vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilane, other silicone-based molecules and mixtures thereof. Such molecules have long chain organic tails **20** that are able to penetrate the polycarbonate pores **16** and act as chemical anchor sites.

[0037] For purposes of this document the UV protection formula may be described as including UV absorbers based on conjugated compounds (containing double bonds) that absorb the UV radiation and re-emit it in the lower energy infrared range. These include benzophenones and benzotriazoles. Additionally, the UV protection, may include UV stabilizers. One of the most effective and important stabilizers are the hindered amine light stabilizers (HALS). Rather than simply absorbing the light energy, these stabilizers work by interrupting the photo degradation process before it can get destructively underway. The mechanisms used include "free radical scavenging", "peroxide decomposition" as well as energy absorption.

[0038] With the exception for water and alcohol, concentrations of the various chemicals may range from 0.01% to 10% each by weight or by volume. Concentrations of water and alcohol can range from 10 to 90% by volume.

[0039] Rinsing of the lens following infusion may comprise dipping the lens **10** in a second rinse tank of distilled ionized water for 10 to 30 seconds that has a temperature anywhere from room temperature to 65° C. The lens **10** is then removed from the tank and air dried such as by means of a drying fan. After performing any necessary scratch resistance testing on a selected test sample specimen, the remaining lenses **10** in the group of lenses being manufactured together are packaged for shipment. As should be appreciated all the steps may be performed by utilizing a robotic system with precise timing and sequencing protocol. Further, it should be appreciated that the headlamp lenses **10** may be infused at the molding site or at a remote facility any time after molding.

[0040] The foregoing has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the embodiments to the precise form disclosed. Obvious modifications and variations are possible in light of the above teachings. All such modifications and variations are within the scope of the appended claims when interpreted in accordance with the breadth to which they are fairly, legally and equitably entitled.

What is claimed:

1. A headlamp lens, comprising:

a polycarbonate substrate; and

an infused protective skin covering at least one surface of said polycarbonate substrate.

2. The lens of claim **1**, wherein said infused protective skin includes a scratch resistance agent and a UV inhibitor.

3. The lens of claim **2**, wherein said scratch resistance agent is silicone based.

4. The lens of claim **3**, wherein said scratch resistance agent is selected from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilane, other silicone-based molecules and mixtures thereof.

5. The lens of claim **4**, wherein said UV inhibitor is selected from a group of materials consisting of a benzophenone, a benzotriazole, a hydroxyphenyltriazine, and mixtures thereof.

6. The lens of claim **5**, wherein said infused protective skin further includes a UV stabilizer.

7. The lens of claim **6**, wherein said UV stabilizer is a hindered amine light stabilizer.

8. The lens of claim **3**, wherein said polycarbonate substrate includes a plurality of pores.

9. The lens of claim **8**, wherein said scratch resistance agent comprises silicone based molecules having relatively large heads and relatively narrow tails wherein said heads rest on a surface of said substrate overlying said pores and said tails penetrate said pores and act as an anchor for said heads.

10. A method of manufacturing a polycarbonate headlamp lens with an infused skin providing scratch resistance and UV protection, comprising:

molding said headlamp lens substrate from polycarbonate material;

cleaning said polycarbonate substrate following molding;

infusing a surface of polycarbonate substrate with a protective skin to produce polycarbonate infused headlamp lens;

rinsing said lens; and

drying said lens.

11. The method of claim **10**, further including increasing thickness of said protective skin following infusing.

12. The method of claim **11**, including increasing thickness of said protective skin by chemically enhanced physical vapor deposition.

13. The method of claim **11**, including incorporating a scratch resistance agent and a UV inhibitor in said protective skin.

14. The method of claim **13**, including selecting said scratch resistance agent from a group of materials consisting of vinyl (mono-, di- and tri-alkoxysilanes), phenyl (mono-, di- and tri-alkoxysilanes), diphenyldialkoxysilanes, vinyltrimethoxysilanes, and other silicone-based molecules and mixtures thereof.

15. The method of claim **14**, including selecting said UV inhibitors from a group of materials consisting of a benzophenone, a benzotriazole, a hydroxyphenyltriazine, and other UV inhibitor compounds and mixtures thereof.

16. The method of claim **15**, including incorporating a UV stabilizer in said protective skin.

17. The method of claim **11**, further including cooling said headlamp lens substrate after molding and prior to cleaning to a temperature between 65° C. and room temperature.

18. The method of claim **13**, wherein infusing includes dipping said substrate into an infusion tank including an infusion solution bath for a period of time of between 10-60 seconds at a temperature of between 65-90° C. so as to open pores in said substrate to allow superficial infusion of said protective skin into said substrate.

19. The method of claim **18**, wherein said scratch resistance agent and said UV inhibitor are infused in (a) a single step or (b) in multiple steps for the purposes of building up the desired thickness of the hard coating.

20. The method of claim **18**, including performing a scratch resistance test to selected infused lenses and adjusting concentration of additives in said infusion solution bath as required until desired results are achieved.

* * * * *

KOITO

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4 August, 2005

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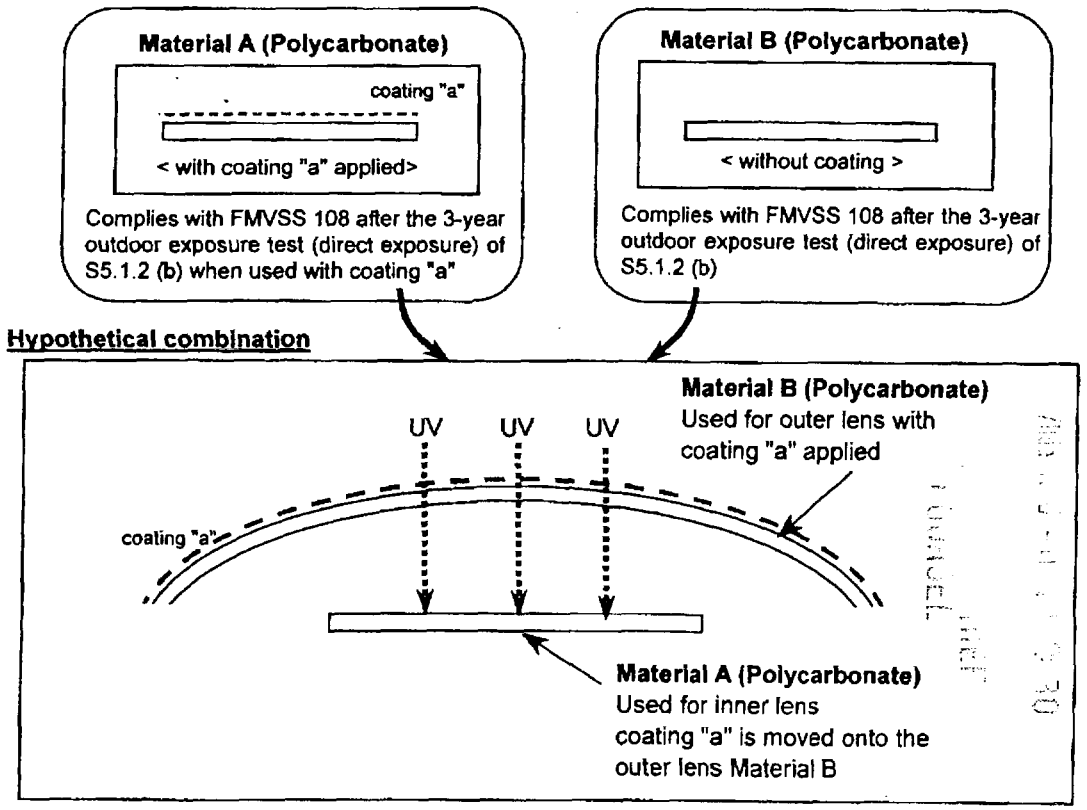
Request for Interpretation: Necessity of carrying out a 3-year outdoor exposure test

Dear Sir:

Koito would like to thank you in advance for your consideration of our request for an interpretation and clarification of the Federal Motor Vehicle Safety Standard (FMVSS) No.108 concerning the necessity of carrying out a 3-year outdoor exposure test in a certain combination of plastic and coating material as explained below.

The Question: Necessity of carrying out a 3-year outdoor exposure test when "material A",which is suitable for direct exposure of FMVSS108 S5.1.2 (b), is used with a covering lens "material B", also suitable for direct exposure of FMVSS108 S5.1.2 (b), and a coating material "a" which was originally on the exterior surface of "material A" is moved to the exterior surface of "material B".

We are contemplating a new combination of plastic lens and coating material for use in an inner lens optics of automotive lamps. In this hypothetical new combination, "material A" (polycarbonate), which is suitable for direct exposure of FMVSS108 S5.1.2 (b) after completion of the 3-year outdoor exposure test when used with coating material "a", is going to be used in the inner lens. "Material B" (polycarbonate), which is also suitable for direct exposure of FMVSS108 S5.1.2 (b), but without coating, is going to be used in the outer lens. Despite that both materials meet FMVSS108 S5.1.2(b) in direct exposure condition, coating material "a" which was originally on the exterior surface of the inner lens "material A" when performing a 3-year exposure test is going to be moved onto the exterior surface of the outer lens "material B", and material A loses the coating "a" from its own surface. (See Figure-1)



< Figure-1 >

We construe that no further testing of this hypothetical material / coating combination is required for the evaluation of the cumulative haze. Inner lens "material A" is still used with the coating material "a", although the coating itself is moved onto the exterior surface of the outer lens "material B". Also, in view of the vast reduction in ultraviolet exposure of inner lens which is afforded by the outer lens "material B", the inner lens "material A" would experience negligible haze when protected by an outer lens. This will further support the argument that haze performance of this material / coating combination is already ensured by the direct exposure of both materials A and B which were confirmed satisfactory to the FMVSS108 S5.1.2 (b) criteria after completion of the 3-year outdoor exposure tests.

Koito Manufacturing thanks you in advance for your early confirmation on this matter.

Sincerely,



Kiminori Hyodo
Deputy General Manager, Regulation & Certification
Koito Manufacturing Co., Ltd.

Docket SVC-124
Std 108

U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

DEPT. OF TRANSPORTATION
DOCKETS

2005 OCT 12 A 11:27

OCT - 4 2005

400 Seventh St., S.W.
Washington, D.C. 20590

NHTSA-05-22709-1

Mr. Kiminori Hyodo
Deputy General Manager, Regulations & Certification
Koito Manufacturing Co., Ltd.
4-8-3, Takanawa
Minato-ku Tokyo
Japan

Dear Mr. Hyodo:

This responds to your recent letter, in which you asked whether it would be necessary to carry out a three-year, outdoor exposure test on a new combination of plastic lens and coating material under Federal Motor Vehicle Safety Standard (FMVSS) No. 108, Lamps, Reflective Devices, and Associated Equipment. Specifically, your letter stated that you plan to use two existing types of polycarbonate materials, each of which independently meets the requirements of S5.1.2 of Standard No. 108 (*i.e.*, Material A with a coating, and Material B without a coating). However, we understand that you now intend to combine these materials, such that Material A is used as an inner lens without a coating, and Material B is used as an outer lens with the same coating that had been applied to Material A. In response to your question, FMVSS No. 108 does not specifically require manufacturers to conduct testing, but it is the manufacturer's responsibility to produce a product that complies with all applicable requirements of our standard when tested in accordance with the standard, and to properly certify compliance.

By way of background, the National Highway Traffic Safety Administration (NHTSA) is authorized to issue FMVSSs that set performance requirements for new motor vehicles and items of motor vehicle equipment. NHTSA does not provide approval of motor vehicles or motor vehicle equipment. Instead, it is the responsibility of manufacturers to self-certify that their products conform to all applicable safety standards that are in effect on the date of manufacture (see 49 U.S.C. 30115 and 49 CFR Part 567, Certification).

We note further that the agency's safety standards specify the test conditions and procedures that NHTSA will use to evaluate the performance of the vehicle or equipment being tested for compliance with the particular safety standard. NHTSA follows the test procedures and conditions applicable and in effect at the time of certification when conducting its compliance testing.

A manufacturer is responsible for ensuring that its product complies with applicable standards when tested in accordance with NHTSA procedures. A manufacturer may choose a valid means other than NHTSA performance test procedures for evaluating its products to determine whether the vehicle or equipment will comply with the safety standards when tested by the agency according to the procedures specified by the standard and to provide a basis for its certification of compliance.

If the agency has reason to believe that an apparent noncompliance exists in a vehicle or item of motor vehicle equipment, the manufacturer is asked to show the basis for its certification that the vehicle or equipment complies with the relevant safety standard(s). If in fact the vehicle or equipment does not comply with a Federal motor vehicle safety standard when tested according to procedures specified by the standard, the manufacturer will have to recall the product to bring it into compliance at no charge to the customer.

In addition, the manufacturer will be subject to civil penalties, unless it can establish that it had no reason to know, despite exercising "reasonable care" in the design and manufacture of the product to ensure compliance, that the product did not in fact comply with the safety standard(s) (49 U.S.C. 30115(a) and 30165). This agency has long said that it is unable to judge what efforts would constitute "reasonable care" in advance of the actual circumstances in which a noncompliance occurs.

As you are aware, the requirements for lighting equipment are contained in FMVSS No. 108, which provides in relevant part:

> S5.1.2 Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE Recommended Practice J576 [Society of Automotive Engineers (SAE) Recommended Practice J576, Plastic Materials for Use in Optical Parts Such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices] JUL91, except that:
>
> (a) Plastic lenses (other than those incorporating reflex reflectors) used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.3 and 4.2 of SAE J576 JUL91 when covered by the outer lens or other material;

(b) After the outdoor exposure test, the haze and loss of surface luster of plastic materials (other than those incorporating reflex reflectors) used for outer lenses shall not be greater than 30 percent haze as measured by ASTM D 1003-92, *Haze and Luminous Transmittance of Transparent Plastic*;

. . .

(g) All outdoor exposure tests shall be 3 years in duration, whether the material is exposed or protected. Accelerated weathering procedures are not permitted.

We note that neither SAE J576 nor Standard No. 108 specifically requires use of a coating.

Thus, the standard sets forth the test that NHTSA follows in conducting compliance testing. Specifically, under SAE J576 (incorporated by reference in FMVSS No. 108), the agency will subject plastic materials used for optical parts to an unaccelerated, three-year outdoor exposure test.

In short, Koito must ensure that its lamps as manufactured conform to all applicable requirements of FMVSS No 108, including that the plastic materials meet the exposure test requirements under S5.1.2. Again, our standards do not compel manufacturers to test the motor vehicles or motor vehicle equipment that they produce under NHTSA's test procedures, although many choose to do so in order to provide a basis for their certification. However, if the agency subjected the lamp in question to compliance testing, the lamp's plastic materials would need to meet the requirements of FMVSS No. 108, as certified.

If you have further questions, please feel free to contact Eric Stas of my staff at this address or by telephone at (202) 366-2992.

Sincerely,

for L. Guerci

Stephen P. Wood
Acting Chief Counsel

HONDA

American Honda Motor Co., In
1919 Torrance Boulevard
Torrance, CA 90501-2746
Phone (310) 783-2000

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NVS-215

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OFFICE OF
DEFECTS INVESTIGATION

May 27, 2004

04V-257
(3 pages)

Mr. Kenneth N. Weinstein,
Associate Administrator
Office of Safety Assurance
NATIONAL HIGHWAY TRAFFIC SAFETY
ADMINISTRATION
400 Seventh St., S.W.
Washington, DC 20590

Dear Mr. Weinstein:

On May 20, 2004, Honda Motor Co., Ltd. (HMC) determined the existence of a noncompliance with Federal Motor Vehicle Safety Standard No. 108, "Lamps, Reflective Devices, and Associated Equipment" in the motor vehicles listed below. The following information is submitted pursuant to the requirements of 49 CFR 573.6.

573.6(c)(1)

Name of manufacturer: Honda Motor Co., Ltd. (HMC)

Manufacturer's agent: William R. Wilen
American Honda Motor Co., Inc. (AHM)
1919 Torrance Blvd.
Torrance, CA 90501-2746

Name of tail lamp manufacturer: Koito Manufacturing Co., Ltd.

573.6(c)(2)

Identification of potentially affected vehicles:

Make/Model	Description	VIN/Dates of Manufacture
Honda S2000	Certain 2000 models	JHMAP114*YT000049 – JHMAP114*YT007115 June 8, 1999 to April 5, 2000

Description of the basis for the determination of the recall population:
The 2000 model year was the introductory year of the S2000. The affected lenses of the side marker lamp and side reflex reflector in the tail lamp assembly were identified based on manufacturing records. The VIN range and manufacturing dates are inclusive of all vehicles that could potentially have a noncomplying lens installed by the factory.

573.6(c)(3)

Total number of vehicles potentially affected: 7,067

573.6(c)(4)

Percentage of affected vehicles that contain the noncompliance: Unknown

573.6(c)(5)

Noncompliance description:

Summary

The lens of the side marker lamp and side reflex reflector in the tail lamp assembly were manufactured with incorrect dye that, under the circumstances of use, does not retain its color over time and, therefore, does not comply with the requirements of Federal Motor Vehicle Safety Standard No. 108, "Lamps, Reflective Devices, and Associated Equipment."

Detail

The lens of the side marker lamp and side reflex reflector in the tail lamp assembly were manufactured using Diazole-base dye instead of Perinone-base dye. The chemical unit of Diazole-base dye, when used in the circumstances of the S2000, is more susceptible to UV and high temperature decomposition. As a result, the red color could fade, which does not comply with the deterioration requirement of Federal Motor Vehicle Safety Standard No. 108, "Lamps, Reflective Devices, and Associated Equipment."

573.6(c)(7)

Determination of noncompliance:

On June 17, 2003, HMC received a report that the color of the tail lamp side marker lens had faded. HMC initiated an investigation. According to Koito's accelerated test, the lens was projected to comply with the deterioration requirement of FMVSS 108. On May 14, 2004, Honda and Koito met with NHTSA to discuss compliance implications. In accordance with NHTSA's opinion, HMC determined the existence of a noncompliance.

573.6(c)(8)(i)

Program for remedying the noncompliance:

The owners of all affected vehicles will be notified by mail to take their vehicle to an authorized Honda dealer. The dealer will replace all affected tail lamp assemblies, free of charge.

573.6(c)(8)(ii)

The estimated date to e-mail preliminary notification to dealers:	Jun. 4, 2004
The estimated date to provide service bulletin to dealers:	Jun. 18, 2004
The estimated date to begin sending notifications to owners:	Jul. 7, 2004
The estimated date of completion of the notification:	Jul. 7, 2004

573.6(c)(9)

Representative copies of all notices, bulletins and other communications:

A copy of the dealer service bulletin and text of the final customer notification letter will be submitted to your office as soon as possible.

573.6(c)(10)

Proposed owner notification letter submission:

A draft of the owner notification letter will be submitted to your office as soon as possible.

573.6(c)(11)

Manufacturer's campaign number:

The number will be submitted to your office as soon as possible.

Sincerely,

AMERICAN HONDA MOTOR CO., INC.

William R. Willen
Managing Counsel
Product Regulatory Office

WRW:ka

Weaverville is located within the prohibited co-channel minimum distance separation of 280.8 kilometers (174.5 miles) to the Sacramento-Stockton television market, one of the designated television markets affected by the Commission's current freeze on allotments and applications pending the outcome of an inquiry into the use of advanced television systems in broadcasting. (*See Order, Advanced Television Systems and Their Impact on Existing Television Broadcasting Service*, 52 Fed. Reg. 28346, July 29, 1987). However, Channel 32 is allotted to Weaverville in compliance with the terms of the freeze *Order* at a restricted site. Interested parties should note that any application submitted for Channel 32 at Weaverville which does not specify a site beyond the ''freeze zone'' governing the allotment will not be accepted for filing.

List of Subjects in 47 CFR Part 73

Television broadcasting.

Part 73 of title 47 of the Code of Federal Regulations is amended as follows:

PART 73—[AMENDED]

1. The authority citation for part 73 continues to read as follows:

Authority: Secs. 303, 48 Stat., as amended, 1082; 47 U.S.C. 154, as amended.

§ 73.606 [Amended]

2. Section 73.606(b), the Table of TV Allotments under California, is amended by adding Weaverville, Channel 32.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 95–21907 Filed 9–1–95; 8:45 am]

BILLING CODE 6712–01–F

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 94–37; Notice 2]

RIN 2127–AF 22

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices and Associated Equipment

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Final rule.

SUMMARY: This notice adopts amendments to the Federal Motor Vehicle Safety Standard on lighting to replace the currently incorporated SAE J576c with the more recent SAE J576 JUL91 as the referenced standard on plastics materials, to replace ASTM D 1003–61 with the more recent ASTM D 1003–92 in the test procedures, and to allow alternative processing techniques, sample sizes and thickness tolerances to those presently specified. These amendments represent the choice of Option 1 from the notice of proposed rulemaking published in November 1994.

DATES: The effective date of the final rule is March 1, 1996.

FOR FURTHER INFORMATION CONTACT: Kenneth O. Hardie, Office of Rulemaking, NHTSA (202–366–6987).

SUPPLEMENTARY INFORMATION: Heraeus DSET Laboratories, Inc. (''DSET''), of Phoenix, Arizona, petitioned NHTSA for rulemaking to amend Federal Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment.* Specifically, DSET asked that paragraph S5.1.2 be amended ''to update the test specimen processing requirements of plastic material used for optical parts such as lenses and reflectors.'' Currently, these materials are required to conform to Society of Automotive Engineers (SAE) Recommended Practice J576c, May 1970. DSET wants NHTSA

> to allow alternative processing techniques besides injection molding to produce test specimens, to allow test specimen sizes other than a 3 inch diameter disc and to change the specimen thickness tolerances from ±0.005 inch to ±.010 inch.

Those requirements for injection molding and for the diameter and thickness of the test specimen are set forth in J576c, May 1970.

NHTSA granted the petition and published a notice of proposed rulemaking in response to it on November 2, 1994 (59 FR 54881). The notice proposed two alternative amendments of S5.1.2 as a means of implementing its grant of DSET's petition. The agency asked commenters for their views on each of the alternatives.

Option 1. This option would substitute SAE J576 JUL91 for SAE J576c, May 1970, and make conforming amendments in the text of S5.1.2. Option 1 would also replace American Society for Testing and Materials (ASTM) D 1003–61 with ASTM D 1003–92 with respect to measurement of haze (which, as currently specified, would not exceed 7 percent). A specimen thickness tolerance of ±0.25 mm (0.010 in.) would also be allowed as there is no technical reason to limit the test specimen thickness tolerance to ±0.005 in., and the value proposed by NHTSA as recommended by DSET appears to be a more reasonable tolerance for test specimens.

Option 2. This option would retain the current SAE and ASTM specifications but would allow processing techniques other than injection molding to produce equivalent test specimens, test specimens other than a disc of 3-inch diameter, and a test specimen thickness tolerance of ±0.010 inch.

Seven comments were received, five of which supported Option 1. These were from Flxible Corporation (''Flxible''), Transportation Safety Equipment Institute (''TSEI''), Robert Bosch, GmbH (''Bosch''), American Automobile Manufacturers Association (''AAMA''), and Ford Motor Company (''Ford''). Miles, Inc. opposed Option 1 and supported Option 2. The Plastics Division of General Electric Corporation (''GE'') did not express a preference for either alternative.

Each of the commenters supporting Option 1 had a different concern. Flxible suggested that NHTSA adopt the base number of each SAE and ASTM standard/recommended practice, with the suffix notation ''Latest Revision.'' In the company's view, this would eliminate the need to revise older materials and ensure that the safety standards reflect contemporary industry practice.

While this is an attractive notion, there are legal constraints against it. The SAE and ASTM materials per se are only guidelines and advisory in nature. Once they are incorporated into the Federal motor vehicle safety standards, they become ''the law of the land'', and a manufacturer must comply with them or face civil sanctions. Under the Administrative Procedure Act, a regulation imposing a substantive burden cannot be adopted in the absence of adequate public notice and an opportunity to comment. Under the approach suggested by Flxible, automatic updating of the safety standards to incorporate the latest SAE and ASTM revisions would occur with no prior public notice or opportunity to comment, and hence violate the Administrative Procedure Act. Further, NHTSA has found that many updated and revised materials change the previous materials in substantive ways. Some changes may not be in the interests of safety; the elimination of the heat test from SAE J576 JUL91 is one example of this. Other changes may increase, rather than reduce, a substantive burden upon industry. Regulated persons and the public must

be apprised of these changes before they are adopted.

NHTSA may, however, adopt an updated version without prior notice where there appears to be no substantive change since such an adoption is in the nature of a technical amendment. The agency is adopting an updated version in this final rule on the basis of a comment from TSEI. Under proposed paragraph S5.1.2(e), after exposure to the heat test, the samples shall conform to the color requirements of SAE J578a October 1966. TSEI pointed out that current paragraph S5.1.5 references SAE J578c February 1977. It recommended that NHTSA change both references to the specification of J578 MAY88.

NHTSA has compared the 1988 and 1977 versions of J578 with that of 1966. It finds no substantive difference between the 1966 and 1977 versions. The 1988 version, however, contains a third method of color measurement to be used ''as a referee approach when the commonly used methods produce questionable results.'' In addition, the Appendix in the latter has added a section of ''Color Measurements of Gaseous Discharge Lighting Devices.'' NHTSA ought to have comment on these changes before adopting SAE J578 MAY88, and, for this reason, has not followed TSEI's suggestion. On the other hand, because of the lack of substantive change between the other two versions, paragraph S5.1.2(e) is added with an update of the J578 reference to 1977 from the 1966 version which was proposed.

The wording of present paragraph S5.2.1 concerned Ford and AAMA. Under this paragraph, phrases such as ''It is recommended that'' and ''should be,'' which appear in materials incorporated by reference, are to be read as setting forth mandatory requirements. Ford and AAMA commented that these phrases should not be interpreted as applying to SAE J576 JUL91. In NHTSA's view, the result of adopting Ford's and AAMA's comments would be to make compliance of plastic materials used for optical parts a voluntary affair. This would defeat the purpose of the rulemaking.

Proposed paragraph S5.1.2(e) would require test samples, after the heat test, to ''show no discernable change in shape and general appearance when compared with an unexposed specimen.'' This language comes from J576 itself, with the exception that the SAE uses ''significant'' rather than ''discernable.'' Ford and AAMA objected to this substitution, arguing that it would establish a higher standard to be met by plastics, and that there is no need to change language that has been a requirement for years. They recommended use of the word ''significant.'' In their view, a change that is ''discernable'' is not necessarily one that is ''significant.''

In its proposal, NHTSA had no intention of increasing the burden on any regulated party. The agency proposed the word ''discernable'' with care, because it is objective, while ''significant'' is not. Motor vehicle safety standards are required by law to be ''objective'', 49 U.S.C. 30111(a). The agency has concluded that ''discernable'' is more appropriate for a requirement specifically expressed in the text of Standard No. 108 (as compared with one incorporated by reference). However, NHTSA wishes to make clear that it views the words as essentially synonymous in this context. If a post-test change in shape or general appearance is discernable, NHTSA considers that to be significant. Such a change indicates the potential for degradation of a lens in use, with a corresponding effect upon color and photometrics of the lamp on which it is installed. To add even greater objectivity, the final rule expresses the requirement as ''discernable to the naked eye.'' Should a change be discernable to the naked eye after testing, and a manufacturer believe that such a change is not ''significant,'' the manufacturer may file a Part 573 Noncompliance Notification Report simultaneously with an application to NHTSA for a determination that the change resulting from that testing is inconsequential to motor vehicle safety.

GE did not choose between the alternatives in its comment. It did, however, recommend the adoption of SAE J576 JUL91 in its entirety, and that NHTSA not carry over the heat test from the previous version of J576. In its view, the heat tests of SAE J575 are adequate until further work is done on thermal issues suitable for incorporation into J576.

Having considered the comments in response to the NPRM, NHTSA is amending Standard No. 108 to add the two new paragraphs proposed, maintaining the performance requirements required of plastic materials by SAE J576c for the heat test and specifying positioning of test samples during the test. These have been omitted by the SAE from J576 JUL91. NHTSA has chosen to retain the existing heat test as one that is familiar to industry and one which meets the need for motor vehicle safety. It is a minimum requirement, intended to establish a margin of safety between the temperatures at which plastic reflectors and lenses may fail from internal heat, and temperatures on the exterior surface induced by exposure to sunlight. Lamp manufacturers use J575 or similar tests to determine whether the particular design characteristics of their lamps require use of premium materials in the lenses. It is a test of the finished lens as installed on the lamp, rather than a test of the materials used in finished products. Use of material with insufficient high temperature performance can result in reflectors that lose color and reflectivity.

The positioning of test samples will allow the sample to droop if its strength is adversely affected by the test.

In order to retain the current 3-year outdoor exposure time test requirements for plastic lenses used or covered by another material and not exposed directly to sunlight, NHTSA is adding a new paragraph S5.1.2(g) to specify that paragraph 3.3.3.1 of SAE J576 JUL91 does not apply as regards protected materials. For the same reason, NHTSA is not adopting paragraph 3.3.3.2. of SAE J576 JUL91 which allows an accelerated 6-month outdoor exposure test time. New paragraph S5.1.2(g) will not change the stringency or flexibility of the standard as it exists, but will ensure that the integrity of plastic materials is maintained by not permitting a lesser exposure time for materials which may be protected when in use.

Miles, Inc., a manufacturer of polycarbonate resin used as a material in lenses and reflectors, objected to Option 1. In its view, this alternative places an additional testing burden on the resin manufacturer, as compared with the present requirements. For this reason, it supported Option 2. Specifically, Miles opposes SAE J576 JUL91 because of Section 3.1 *Materials to be Tested.* This section reads:

> Outdoor exposure tests shall be made on each material * * * offered for use in optical parts * * *. Concentrations of polymer components and additives such as plasticizer, lubricants, colorants, weathering stabilizers, and antioxidants in plastic materials and/or coatings may be changed without outdoor exposure testing if: the changes are within the limits of composition represented by higher and lower concentrations of these polymer components and additives have been tested in accordance with 3.3 and found to meet the requirements of Section 4.

Miles interprets this language to mean that changes in dye concentrations would only be permissible if samples containing lower and higher concentrations of dye had been exposure tested. Miles believes that this, in effect, would double the samples to

be tested when compared with the present requirements.

The present requirements are those of section 3.1 of SAE J576c, May 1970. These state, in pertinent part, that ''[a] test of one color and formulation shall cover variations in dye concentration, but shall not cover changes in dye materials or changes in polymers.'' Miles interprets this as meaning that a new exposure test need not be conducted under the 1970 version if the only change in the product is a variation in dye concentration. Its present practice is to test for exposure materials incorporating new dyes only at the expected concentration level of the dye. One exposure test covers each new dye, but Miles will accept the test results as valid when there are small variations in dye concentration.

Miles is correct that SAE J576c allows a single test to cover variations in dye concentration. SAE J576 JUL91 may be interpreted as calling for the testing of two samples by specifying that dye concentrations in material to be used in motor vehicle optical parts must fall within the upper and lower limits of dye concentrations tested if there are variations in dye concentration. Miles believes the newer requirement will double its testing burden.

NHTSA does not agree that this is the inevitable result of the adoption of this portion of SAE J576 JUL 91. What paragraph S5.1.2 is intended to ensure is that lenses and reflectors, as manufactured for use on motor vehicles, are fabricated from plastic materials that meet SAE J576. The key issue is whether the equipment satisfies the performance requirements of the standard, not the number of tests conducted on the materials used in the equipment. Ultimately, the manufacturer of the vehicle in certifying compliance with all applicable Federal motor vehicle safety standards, is certifying that the lenses and reflectors on the vehicle are made from plastics materials that meet J576. If the lens or reflector is manufactured as replacement equipment, the certification responsibility is that of the manufacturer of the equipment. Thus, it is incumbent upon the vehicle or equipment manufacturer to assure itself that the materials it obtains from the plastics manufacturer comply with SAE J576 (and, furthermore, not to change the composition of the plastics materials so obtained in a manner that would cause it to be noncomplying). The documentation needed for such assurance, including the quantum of testing performed by the plastics manufacturer and by the vehicle or equipment manufacturer, is a decision that each equipment or vehicle manufacturer must make under the particular circumstances. NHTSA, of course, expects manufacturers to exercise reasonable care in certifying their products, and, in the event of a noncompliance, the manufacturer may claim that it had no reason to know, despite exercising reasonable care, that the vehicle or equipment failed to comply. However, the allocation of that responsibility is a matter of contract between the manufacturer with the Federal certification responsibility and its plastic materials supplier. Plastic materials are not completed items of motor vehicle equipment subject to Standard No. 108 so the Federal certification responsibility does not fall upon Miles. If Miles or other materials manufacturers are satisfied, based on their extensive experience with dyes, that changes in dye concentration would not cause the plastic material to fail the specified performance requirements, they may be able to persuade their purchasers that additional testing is not needed.

Effective Date

The effective date of the final rule is March 1, 1996.

Rulemaking Analyses and Notices

Executive Order 12866 and DOT Regulatory Policies and Procedures. This final rule was not reviewed under Executive Order 12866. It has been determined that the rulemaking action is not significant under Department of Transportation regulatory policies and procedures. The purpose of the rulemaking action is to update testing procedures. Since the final rule will have no significant cost or other impacts, preparation of a full regulatory evaluation is not warranted.

National Environmental Policy Act. NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The final rule will not have a significant effect upon the environment. The composition of plastic materials used in optical parts will not change from those presently in production.

Regulatory Flexibility Act. The agency has also considered the impacts of this rulemaking action in relation to the Regulatory Flexibility Act. I certify that this rulemaking action does not have a significant economic impact upon a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and motor vehicle equipment, those affected by the rulemaking action, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Further, small organizations and governmental jurisdictions will not be significantly affected because the price of new vehicles and vehicle equipment will not be impacted.

Executive Order 12612 (Federalism). This rulemaking action has also been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and NHTSA has determined that this rulemaking action does not have sufficient Federalism implications to warrant the preparation of a federalism Assessment.

Civil Justice. The final rule will not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. 49 U.S.C. 30161 sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, 49 CFR part 571 is amended as follows:

1. The authority citation for part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.108 is amended by revising paragraph S5.1.2, to read as follows:

§ 571.108 Motor Vehicle Safety Standard No. 108; Lamps, reflective devices, and associated equipment.

* * * * *

S5.1.2 Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE Recommended Practice J576 JUL91, except that:

(a) Plastic lenses (other than those incorporating reflex reflectors) used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.3 and 4.2 of SAE J576 JULY91 when covered by the outer lens or other material;

(b) After the outdoor exposure test, the haze and loss of surface luster of

plastic materials (other than those incorporating reflex reflectors) used for outer lenses shall not be greater than 30 percent haze as measured by ASTM D 1003–92, *Haze and Luminous Transmittance of Transparent Plastic;*

(c) After the outdoor exposure test, plastic materials used for reflex reflectors and for lenses used in front of reflex reflectors shall not show surface deterioration, crazing, dimensional changes, color bleeding, delamination, loss of surface luster, or haze that exceeds 7 percent as measured under ASTM D 1003–92.

(d) The thickness of the test specimens specified in paragraph 3.2.2 of SAE J576 JUL91 may vary by as much as ±0.25 mm.

(e) After exposure to the heat test as specified in subparagraph (f) of this paragraph, and after cooling to room ambient temperature, a test specimen shall show no change in shape and general appearance discernable to the naked eye when compared with an unexposed specimen. The trichromatic coefficients of the samples shall conform to the requirements of SAE J578c, ''Color Specification for Electric Signal Lighting Devices'', February 1977.

(f) Two samples of each thickness of each plastic material are used in the heat test. Each sample is supported at the bottom, with at least 51 mm. of the sample above the support, in the vertical position in such a manner that, on each side, the minimum uninterrupted area of exposed surface is not less than 3225 sq. mm. The samples are placed for two hours in a circulating air oven at 79 ± 3 degrees C.

(g) All outdoor exposure tests shall be 3 years in duration, whether the material is exposed or protected. Accelerated weathering procedures are not permitted.

* * * * *

Issued on August 29, 1995.

Ricardo Martinez,

Administrator.

[FR Doc. 95–21865 Filed 9–1–95; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 672

[Docket No. 950206041–5041–01; I.D. 082895A]

Groundfish of the Gulf of Alaska; Pacific Cod with Jig and Pot Gear for Processing by the Inshore Component in the Central Regulatory Area

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Modification of a closure.

SUMMARY: NMFS is opening directed fishing for Pacific cod by vessels catching Pacific cod with jig and pot gear for processing by the inshore component in the Central Regulatory Area of the Gulf of Alaska (GOA). This action is necessary to use the total allowable catch (TAC) for Pacific cod in this area.

EFFECTIVE DATE: 12 noon, Alaska local time (A.l.t.), September 1, 1995, until 12 midnight, A.l.t., December 31, 1995.

FOR FURTHER INFORMATION CONTACT: Andrew N. Smoker, 907–586-7228.

SUPPLEMENTARY INFORMATION: The groundfish fishery in the GOA exclusive economic zone is managed by NMFS according to the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP) prepared by the North Pacific Fishery Management Council under authority of the Magnuson Fishery Conservation and Management Act. Fishing by U.S. vessels is governed by regulations implementing the FMP at 50 CFR parts 620 and 672.

In accordance with § 672.20(c)(1)(ii)(B), the allocation of Pacific cod for the inshore component in the Central Regulatory Area of the GOA was established by the Final 1995 Harvest Specifications of Groundfish (60 FR 8470, February 14, 1995) as 41,085 metric tons (mt). The directed fishery for Pacific cod by vessels catching Pacific cod for processing by the inshore component in the Central Regulatory Area of the GOA was closed under § 672.20(c)(2)(ii) on March 22, 1995, in order to reserve amounts anticipated to be needed for incidental catch in other fisheries (60 FR 15521, March 24, 1995). NMFS has determined that as of August 8, 1995, 4,313 mt remain unharvested.

The Director, Alaska Region, NMFS, has determined that the 1995 TAC for Pacific cod for processing by the inshore component in the Central Regulatory Area of the GOA has not been reached. Therefore, NMFS is terminating the previous closure and is opening directed fishing for Pacific cod by vessels catching Pacific cod for processing by the inshore component in the Central Regulatory Area of the GOA. All other closures remain in full force and effect.

This action opens the directed fishery for Pacific cod by vessels catching Pacific cod with jig and pot gear for processing by the inshore component in the Central Regulatory Area of the GOA. Directed fishing for groundfish with hook-and-line and trawl gear is currently prohibited (60 FR 26694, May 18, 1995; 60 FR 37600, July 21, 1995; 60 FR 37601, July 21, 1995).

Classification

This action is taken under 50 CFR 672.20 and is exempt from review under E.O. 12866.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: August 29, 1995.

Richard H. Schaefer,

Director, Office of Fisheries Conservation and Management, National Marine Fisheries Service.

[FR Doc. 95–21948 Filed 8–30–95; 3:43 pm]

BILLING CODE 3510–22–F

50 CFR Part 672

[Docket No. 950206041–5041–01; I.D. 082995A]

Groundfish of the Gulf of Alaska; Trawling in the Western Regulatory Area

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Inseason adjustment; request for comments.

SUMMARY: NMFS issues an inseason adjustment closing the season for all groundfish by vessels using trawl gear, except fishing for pollock by vessels using pelagic trawl gear, in the Western Regulatory Area of the Gulf of Alaska (GOA). This action is necessary to prevent overfishing of Pacific ocean perch (POP).

DATES: Effective 12 noon, Alaska local time (A.l.t.), September 1, 1995, until 12 midnight, A.l.t., December 31, 1995. Comments must be received no later than 4:30 p.m., A.l.t., September 18, 1995.

ADDRESSES: Comments may be sent to Ronald J. Berg, Chief, Fisheries Management Division, Alaska Region, NMFS, P.O. Box 21668, Juneau, AK 99802, Attn. Lori Gravel, or be delivered

Mr. Shigeyoshi Aihara
Project Manager
Regulation and Compliance
Engineering Administration Department
Ichikoh Industries, Ltd.
80 Itado Ishehara City
Kanagawa Pref.
250-1192 Japan

Dear Mr. Aihara:

This is in reply to your letter of June 10, 1999, presented at a meeting with NHTSA representatives that day, asking for an interpretation of S5.1.2 of Federal Motor Vehicle Safety Standard No. 108. I am sorry that we were unable to provide you a response by July 6 as you requested in your letter of June 28 to Taylor Vinson of this Office.

Your company has developed a new rear turn signal lamp, consisting of an outer plastic lens, an inner cap, and an uncolored filament bulb. The color of the lens is "pale (light) pink color, and, this plastic material complies with the requirements of SAE J576c . . . excluding the color requirement." You tell us that the trichromaticity coordinates of the plastic material used in the outer lens do not fall within either the red or the white areas of the chromaticity chart of SAE J578c. However, when illuminated, the lamp provides an amber color that fall within the coordinates specified in SAE J578c. You have asked whether this design is acceptable under S5.1.2 relating to plastic materials used in optical parts of motor vehicle lighting devices.

Although this does not affect our answer to your question, please note, in Standard No. 108, that SAE Recommended Practice J576c of 1970 has been replaced by SAE J576 JUL91 as the applicable standard for plastic materials used in lighting devices. However, J578c remains the Federal standard for color.

We regret to inform you that this design is not acceptable. Although S1, *Scope,* of SAE J578c states that "The specification applies to the overall effective color of light emitted by the device," regardless of the color of its lens, both SAE J576 JUL91 and Standard No. 108 apply the color requirement to plastic components of lamps as well. S5.1.2(e) of Standard No. 108 requires the trichromatic coordinates of the plastic samples, tested according to that paragraph, to conform to the requirements of SAE J578c. Paragraphs 4.1 and 4.2.2 of SAE J576 JUL91 also require conformance of plastic samples to the chromaticity coordinate requirements of SAE J578c. This standard specifies color coordinates only for red, white, yellow (amber), green, and blue. Because the lens of your lamp does not meet any of the coordinates of SAE J578c, Standard No. 108 does not permit its use.

At the meeting, we noted that the iner lens was a greenish color. It, too, must comply with the color coordinate requirements of paragraphs 4.1 and 4.2.2 of SAE J576 JUL91.

At that time, you also asked if it were acceptable to use a plastic fabricated from the mix of two resins, each of which complied with the requirements of SAE J576. You cannot assume, when two complying resins are blended, that the resulting plastic will also comply with SAE J576 JUL91, and we recommend that you test the blended plastic to ensure that it meets all the specifications of S5.1.2 and SAE J576 JUL91. This would be the case whether it was the intent to create a new color, or whether the rejected molded parts are reground and plastics of differing compositions are mixed and recycled into newly-molded lamp lenses. As we said in the preamble to the 1995 final rule amending S5.1.2, "it is incumbent upon the vehicle or equipment manufacturer . . . not to change the composition of the plastics materials [obtained from the plastics manufacturer] in a manner that would cause it to be noncomplying." 60 FR 46066, copy enclosed.

Sincerely,
Frank Seales, Jr.
Chief Counsel
Enclosure
ref:108
d.8/27/99

Docket SVC-124
Std 108

U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

MAR 27 2009

1200 New Jersey Avenue SE.
Washington, DC 20590

09 MAY 01 AM 10:10
DEPT OF TRANSPORTATION
DOCKETS

Mr. Kiminori Hyodo
Deputy General Manager, Regulation & Certification
Koito Manufacturing Co., Ltd.
4-8-3, Takanawa
Minato-Ku Tokyo
Japan

Dear Mr. Hyodo:

This responds to your letter, in which you ask about test requirements for plastic materials for use in lenses under Federal Motor Vehicle Safety Standard (FMVSS) No. 108, Lamps, Reflective Devices, and Associated Equipment. Specifically, you asked whether you could exclude the presence of metal particles contained within a plastic lens from the outdoor exposure test incorporated by reference into Standard No. 108. You also asked what the term "lens" means under S5.1.2 of FMVSS No. 108. Our responses are presented below.

By way of background, the National Highway Traffic Safety Administration (NHTSA) is authorized to issue FMVSSs that set performance requirements for new motor vehicles and items of motor vehicle equipment (see 49 U.S.C. Chapter 301). NHTSA does not provide approvals of motor vehicles or motor vehicle equipment. Instead, manufacturers are required to self-certify that their products conform to all applicable safety standards that are in effect on the date of manufacture. NHTSA selects a sampling of new vehicles and regulated equipment each year to determine their compliance with applicable FMVSSs. If our testing or examination reveals an apparent noncompliance, we may require the manufacturer to remedy the noncompliance, and may initiate an enforcement proceeding if necessary to ensure that the manufacturer takes appropriate action.

Do the metal particles need to be included in the "haze test?"

Your first question relates to the presence of a layer of metal particles on the lens. According to your letter, a process called "half-metalization" allows you to create a semitransparent metallic layer on your lens, between the lens and a protective coating. This half-metalized layer effectively reduces light transmission to about 30% of a non-metalized lens.

As you state in your letter, FMVSS No. 108 requires that optical parts be certified to comply with the testing procedures in SAE Recommended Practice J576 (JUL 91), "Plastic Materials for use in Optical Parts such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices," incorporated by reference into paragraph S5.1.2 of the standard. Part of this practice specifies that materials be subject to a three year outdoor exposure test. Your specific question asked if you could exclude the presence of the metal particles from the three year exposure test. In asking this question, you state that metals are inorganic and do not excite plastics and also, since half-metalization is applied on the inner surface and protected by the coating, it would not be oxidized.

In responding to your question as to whether you can exclude the metal particles from the test, we note that each of this agency's safety standards specifies the test conditions and procedures that this agency will use to evaluate the performance of the vehicle or equipment being tested for compliance with the particular safety standard. NHTSA follows these specified test procedures and conditions when conducting its compliance testing.

Manufacturers are not required to test their products in the manner specified in the relevant safety standard, or even to test the product at all, as their basis for certifying that the product complies with all relevant standards. A manufacturer may choose any valid means of evaluating its products to determine whether the vehicle or equipment will comply with the safety standards when tested by the agency according to the procedures specified in the standard and to provide a basis for its certification of compliance.

If we tested this product, the outdoor exposure test would include the presence of the metal particles. There is nothing in FMVSS No. 108, including the relevant items incorporated by reference, that specifies excluding the particles. We also note that much like protective coatings, these particles have a substantial effect on the transparency and endurance of the lens, and we therefore believe they should be included as part of the lens in all relevant test requirements.

Definition of the term "lens"

Your second question concerned the definition of the term "lens" under S5.1.2 of FMVSS No. 108, and whether that definition would include a half-metalized area surrounding the effective projected luminous lens area. You stated that the non-metalized portion of the lens would meet all photometric requirements of the standard, and that it would be surrounded by a half-metalized portion of the lens, which would emit only a small amount of light for decorative purposes.

The term "lens," while not explicitly defined in Standard No. 108, is commonly understood within automotive lighting lamp applications as a component of a lamp that as installed allows light to pass through it. For the purposes of S5.1.2, all plastic portions of this component that allow light to pass through it are part of the "lens," subject to the haze test, including the half-metalized area that you state would emit a small amount of light.

Are the non-EPLLA portions of the lens subject to the S5.1.2 requirements?

You followed up your second question by asking, "when half-metalization is applied only to the part surrounding the effective projected luminous lens area, would it be excluded from [the] S5.1.2 requirement?" Our answer is no.

It is our opinion that all portions of the lens, including the half-metalized areas that only emit small amounts of light for decorative purposes, are subject to the requirements of S5.1.2, which specify haze and weathering requirements similar to those described in SAE Recommended Practice J576.

The language of S5.1.2 reads, "Plastic materials used for optical parts such as lenses and reflectors shall conform to [SAE J576]...." When testing plastic materials, however, the agency does not simply test a plastic plaque alone. Instead, the plastic plaque is tested with its coating, which frequently is necessary to protect the plastic from the effects of weathering. The coating on the plastic is an integral feature in protecting the plastic from moisture, ultraviolet light, and other agents.

You described your lens as having a semitransparent metallic layer between the lens and the coating. In addition to the effect this has on the transparency of that portion of the lens, it may also affect the weathering aspects. For example, if the metal layer affected the bonding of the coating to the plastic, it could have substantial affect on whether the lens could tolerate weathering.

Because, as described above, the lens is a single piece, if even a decorative, half-metalized portion of the lens were to fail the weathering requirements in S5.1.2, it could have a substantial affect on the entire lens. For example, moisture could enter the lens, affecting the non-metalized portion's transparency.

For these reasons, when testing the lens you described, the half-metalized portion of the lamp design described in your letter would be included as an item subject to the testing requirements of S5.1.2 of FMVSS No. 108.

If you have any further questions, please contact Ari Scott of my staff at (202) 366-2992.

Sincerely yours,



Stephen P. Wood
Acting Chief Counsel

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DEPT OF TRANSPORTATION
DOCKETS

12 October, 2007

U.S. Dept. of Transportation
NHTSA
Office of the Chief Counsel
400 seventh Street SW
Washington DC 20590

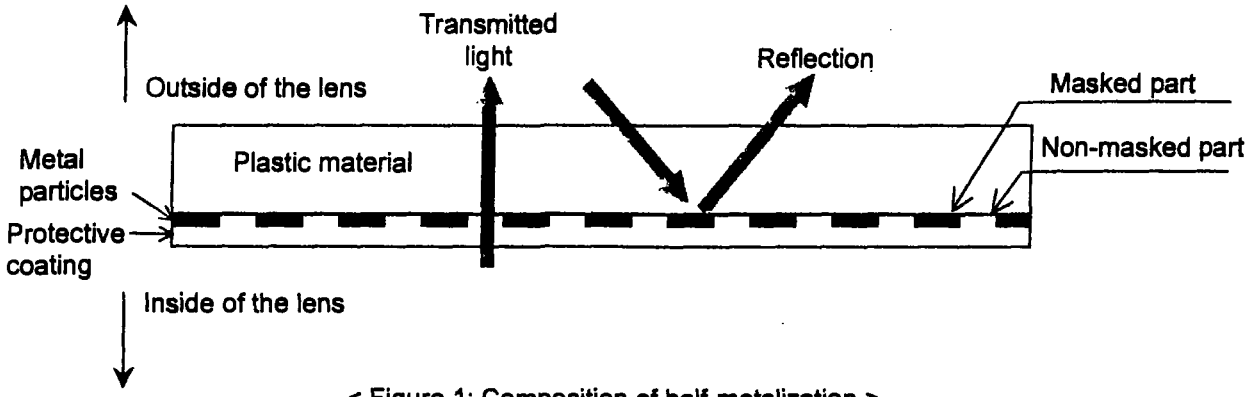
Request for Interpretation

Dear Mr. Anthony M. Cooke,

Koito would like to thank you in advance for your consideration of our request for an interpretation and clarification of the Federal Motor Vehicle Safety Standard (FMVSS) No.108 concerning the necessity of carrying out a 3-year outdoor exposure test in a certain combination of plastic and protective coating material with metal particles in between.

Description:

We are contemplating a new technique called "half-metalization (evapolization)", which is to be applied on the inner surface of a plastic lens of automotive lamps. "Half-metalization" is an expanded application of metal evaporation which is widely used for the surface treatment of lamp reflectors. In this new technique, careful conditioning of the metal density enables us to make a specular appearance of the lens surface, where the light transmission would be lowered to e.g. 30% of a non-metalized lens.



< Figure 1: Composition of half-metalization >

As you see in the figure above, in a microscopic view, the metal particles placed between the plastic and protective coating create partial maskings on the lens, whereas the light passes from the non-masked part only. However, when used in a lamp, this reduced transmission will be balanced out by other designing factors so that the lamp satisfies all the FMVSS108 requirements (e.g. photometric, color) applicable to it.

Question No.1: Can we exclude the presence of metal particles from the target of SAE J576 3-year outdoor exposure test?

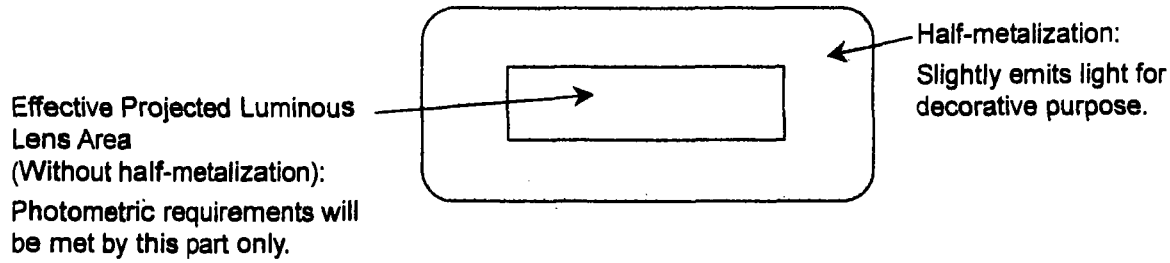
FMSSS 108 requires that plastic materials used for optical parts must be in compliance with SAE J576 JUL91 (S5.1.2.) including the 3-year outdoor exposure test. We basically understand that the target of 3-year outdoor exposure test (i.e. measurement of luminous transmittance, haze, and compliance with SAE J578 chromaticity and appearance requirement as required under S4.2 of SAE J576 JUL91) is a combination of plastic and coating, whereas if they comply with the 3-year outdoor exposure requirement, the metal particles on the lens (where the light does not pass) can be excluded from the test. In this case, however, the lamp using half-metalized lens must be designed to satisfy all the applicable requirements (e.g. photometric and color) required by FMVSS108.

Supporting this discussion, we can say that metals are inorganic and do not excite plastics. Also, since half-metalization is applied on the inner surface and protected by the coating, it would not be oxidized.

Question No.2: What the term "lens" means under S5.1.2. of FMVSS108?

S5.1.2. of FMVSS108 requires that plastic materials used for optical parts such as lenses and reflectors shall conform to SAE J576 JUL91. Does the term "lens" under S5.1.2. indicate the effective part of the lens (corresponding to the effective projected luminous lens area) only, or whole part of the lens?

In conjunction with above question, when half-metalization is applied only to the part surrounding the effective projected luminous lens area, would it be excluded from S5.1.2. requirement? (In this case, of course, photometric requirements will be met by the effective projected luminous lens area only, and the half-metalized part slightly emits light for decorative purpose.)



< Figure 2: Half-metalization outside EPLLA >

Koito Manufacturing thanks you in advance for your early confirmation on this matter.

Sincerely,

Kiminori Hyodo
Deputy General Manager, Regulation & Homologation
Koito Manufacturing Co., Ltd.

were amended in 2005. Reinstating the specific language in the regulations will therefore not increase the paperwork burden on those manufacturers.

H. Executive Order 13045

Executive Order 13045 applies to any rule that (1) is determined to be ''economically significant'' as defined under E.O. 12866, and (2) concerns an environmental, health, or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned rule is preferable to other potentially effective and reasonably feasible alternatives considered by us. This rulemaking is not economically significant and does not concern an environmental, health, or safety risk.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272) directs NHTSA to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies, such as the Society of Automotive Engineers (SAE). The NTTAA directs the agency to provide Congress, through the OMB, with explanations when we decide not to use available and applicable voluntary consensus standards.

In this final rule, we are adding to 49 CFR 576.4(g)(5) the requirement that manufacturers include in the certification labels that they affix to certain types of motor vehicles a statement certifying that the vehicle conforms to all applicable FMVSS. This language was inadvertently omitted from the regulation in 2005 and we are adopting no substantive changes to the regulation nor do we propose any technical standards. For these reasons, Section 12(d) of the NTTAA would not apply.

J. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

List of Subjects in 49 CFR Part 567

Labeling, Motor vehicle safety, Motor vehicles.

In consideration of the foregoing, Part 567, Certification, in Title 49 of the Code of Federal Regulations is amended as follows:

PART 567—CERTIFICATION

■ 1. The authority citation for part 567 is revised to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, 30166, 32502, 32504, 33101–33104, 33108, and 33109; delegation of authority at 49 CFR 1.95.

■ 2. Amend § 567.4 by adding paragraph (g)(5)(iv) to read as follows:

§ 567.4 Requirements for manufacturers of motor vehicles.

* * * * *

(g) * * *

(5) * * *

(iv) For all other vehicles, the statement: ''This vehicle conforms to all applicable Federal motor vehicle safety standards in effect on the date of manufacture shown above.'' The expression ''U.S.'' or ''U.S.A.'' may be inserted before the word ''Federal''.

* * * * *

Issued on: November 28, 2012.

Daniel C. Smith,

Senior Associate Administrator for Vehicle Safety.

[FR Doc. 2012–29132 Filed 12–3–12; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2012–0171]

RIN 2127–AK99

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: NHTSA is amending the Federal motor vehicle safety standard (FMVSS) on lamps, reflective devices, and associated equipment to restore the blue and green color boundaries that were removed when the agency published a final rule reorganizing that standard on December 4, 2007.

DATES: *Effective date:* December 4, 2012.

Petitions for reconsideration: Petitions for reconsideration of this final rule must be received not later than January 18, 2013.

ADDRESSES: Any petitions for reconsideration should refer to the docket number of this document and be submitted to: Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, West Building, Ground Floor, Docket Room W12–140, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: For technical issues: Ms. Marisol Medri, Office of Crash Avoidance Standards, NHTSA, 1200 New Jersey Avenue SE, West Building, Washington, DC 20590 (Telephone: (202) 366–6987) (Fax: (202) 366–7002).

For legal issues: Mr. Thomas Healy, Office of the Chief Counsel, NHTSA, 1200 New Jersey Avenue SE, West Building, Washington, DC 20590 (Telephone: (202) 366–2992) (Fax: (202) 366–3820).

SUPPLEMENTARY INFORMATION:

I. Background

FMVSS No. 108, *Lamps, Reflective Devices and Associated Equipment,* has been in existence since 1968. The standard had been amended on an *ad hoc* basis over time resulting in a patchwork organization of the standard. NHTSA published a final rule on December 4, 2007,[1] amending FMVSS No. 108 by reorganizing the regulatory text so that it provides a more straightforward and logical presentation of the applicable regulatory requirements; incorporating important agency interpretations of the existing requirements; and reducing reliance on third-party documents incorporated by reference. The preamble of the final rule stated that the rewrite of FMVSS No. 108 was administrative in nature and would have no impact on the substantive requirements of the standard. The December 4, 2007 final rule made several changes to the proposal contained in the Notice of Proposed Rulemaking for that rule including removing the blue and green color boundary requirements from paragraph S14.4.1.3.2 and eliminating references to three additional SAE documents.

[1] 72 FR 68234, (Dec. 4, 2007). The agency published the Notice of Proposed Rulemaking proposing to reorganize the standard on December 30, 2005. 70 FR 77454, (Dec. 30, 2005).

SABIC Innovative Plastics US LLC (SABIC–IP) sent a letter to NHTSA on August 11, 2008, after the final rule comment period was over. In this letter, SABIC–IP stated that the agency did not allow for public comment when it made the decision to remove the blue and green color boundaries from the standard. SABIC–IP further stated that in removing the blue and green color boundaries from paragraph S14.4.1.3.2, the agency substantively changed the requirements of FMVSS No. 108 during the rewrite process. On July 13, 2011, NHTSA published a NPRM [2] initiating this rulemaking to replace the color boundaries that were removed during the administrative rewrite of the standard.

In the NPRM, the agency explained that while neither blue nor green are directly permitted by the standard, it is possible to use these color boundaries to certify a material to the outdoor exposure test. Once individually certified to the three year outdoor exposure test, the blue and clear material could be mixed to produce a clear material with a blue tint, which could then be used in a lamp lens provided the lamp itself emits light within the white color boundary. Under the standard, the mixed material can be certified to the outdoor exposure test without an additional three years of testing. The pre-rewrite version of the standard contained two tests for determining compliance with the color requirements in the standard, the Visual Method or the Tristimulus Method. The blue and green color boundary definitions that were removed are part of the color requirements of the Tristimulus method procedure. The NPRM proposed to amend FMVSS No. 108 to restore the color boundary definitions for green, restricted blue and signal blue so that the requirements of the rewrite coincide with those of the old standard.

II. Public Comments on NPRM

NHTSA received four public comments in response to the Notice of Proposed Rulemaking for this rulemaking.[3] All of the comments supported reinstating the color boundary definitions for green, restricted blue and signal blue to FMVSS No. 108.

The Alliance of Automobile Manufacturers (the ''Alliance'') supported the rulemaking but stated that the agency omitted the color requirements for green and blue when tested according to the visual method. The Alliance claimed that these requirements from SAE J578c *Color Specification for Electric Signal Lighting Devices,* (FEB 1977) (the third party standard from which the color boundaries were derived) were incorporated into the NPRM proposing the reorganization of the standard but were not incorporated into the December 4, 2007 Final Rule. The Alliance recommended that these requirements be reinstated into the standard as sections 14.4.1.3.2.4 and 14.4.1.3.2.5.

SABIC–IP submitted a comment urging the agency to restore the green and blue color boundaries to FMVSS No. 108. SABIC–IP also requested that the agency clarify that polymers and additives would not have to be retested to the three year outdoor exposure test after the effective date of the administrative rewrite before being combined to create new materials. SABIC–IP stated that the rewrite of the standard creates ambiguity as to whether combinations of individually certified materials can continue to be mixed to create new material and then certified to the outdoor exposure test without an additional three years of testing as was permitted under the pre-write version of the standard. SABIC–IP requested that NHTSA amend paragraph S14.4.2.2.2 to state that materials and additives used in plastics could be changed without outdoor exposure testing if the materials had previously been tested to FMVSS No. 108 and found to meet the requirements. Paragraph S14.4.2.2.2 currently states that materials and additives used in plastics can be changed without outdoor exposure testing if the materials have previously been tested to ''this section'' and found to meet the requirements. SABIC–IP believes that it is possible to interpret the use of the words ''this section'' in paragraph S14.4.2.2.2 to require that materials be retested to the outdoor exposure test in the new paragraph S14.4.2.2.2, published in December 2007, before they can be used to create new materials. SABIC–IP stated that this interpretation would go against the stated goal of the rewrite of the standard to refrain from making any substantive change to the requirements.

SABIC–IP also asked the agency to clarify that the lower concentration of additive of previously tested materials used to create a new material according to S14.4.2.2.2 paragraph can be represented by a composition of zero.

III. Agency Decision

Since it was not the agency's intention to create any substantive modifications to the standard, we have decided to amend FMVSS No. 108 to add the color boundary definitions for green, restricted blue and signal blue to the Tristimulus method procedure as proposed in the NPRM and to include the two missing color requirements from the visual method procedure so that the requirements of the rewrite coincide with those of the old standard.

We have decided not to amend paragraph S14.4.2.2.2 of FMVSS No. 108 as requested by SABIC–IP over the course of the rewrite rulemaking. We attempted, where ever possible, to avoid changes to the language of the standard. We note that the phrase ''this section'' refers to the requirements of paragraph S14.4.2.2 in general, not to a specific version of the standard. Thus, so long as the additives and polymers have previously been tested to and found to comply with the same substantive requirements as they appear in FMVSS No. 108, they can be added to create new materials without additional outdoor exposure testing. However, if the requirements of S14.4.2.2 were changed, previously tested additives and polymers would no longer have been tested to ''this section'' and would have to be retested to the outdoor exposure test before being used to create new materials under paragraph S14.4.2.2.2.

The agency will respond to SABIC–IP's comment about the lower concentration of additive used to create new materials being represented by a composition of zero in a letter of interpretation from the NHTSA Office of Chief Counsel.

IV. Effective Date

The National Highway and Motor Vehicle Safety Act states that an FMVSS issued by NHTSA cannot become effective before 180 days after the standard is issued unless the agency makes a good cause finding that a different effective date is in the public interest. Additionally, the Administrative Procedure Act (5 U.S.C. 553(d)) requires that a rule be published 30 days prior to its effective date unless one of three exceptions applies. One of these exceptions is when the agency finds good cause for a shorter period. We have determined that it is in the public interest for this final rule to have an immediate effective date so that the effective date of this final rule coincides as closely as possible with the effective date of the 2007 rewrite of the standard. An effective date for this final rule that

[2] 76 FR 41181, (July 13, 2011).

[3] The Alliance of Automobile Manufacturers, SABIC–IP and two private individuals submitted comments in response to the NPRM.

closely coincides with the 2007 rewrite of the standard will ensure that the requirements of FMVSS No. 108 remain consistent so as to avoid unnecessary changes in the requirements of the standard that would force regulated parties to change their compliance strategies, potentially imposing costs on manufacturers while not improving safety.

V. Regulatory Notices and Analyses

A. Executive Order 12866, Executive Order 13563, and DOT Regulatory Policies and Procedures

NHTSA has considered the impact of this rulemaking action under Executive Order 12866, Executive Order 13563, and the DOT's regulatory policies and procedures. This final rule was not reviewed by the Office of Management and Budget (OMB) under E.O. 12866, ''Regulatory Planning and Review.'' It is not considered to be significant under E.O. 12866 or the Department's regulatory policies and procedures.

This Final Rule restores existing requirements to the standard thereby maintaining flexibility in compliance for manufacturers who choose to use these colors to certify materials to the outdoor exposure test. Because this Final Rule merely restores existing requirements it is not expected to have any costs. The agency expects some minor unquantifiable benefits to manufacturers due to the continued availability of the green and blue color boundaries to certify to the outdoor exposure test. Because there are not any costs associated with this rulemaking and only minor unquantifiable benefits, we have not prepared a separate economic analysis for this rulemaking.

B. Executive Order 13609: Promoting International Regulatory Cooperation

The policy statement in section 1 of Executive Order 13609 provides, in part:

> The regulatory approaches taken by foreign governments may differ from those taken by U.S. regulatory agencies to address similar issues. In some cases, the differences between the regulatory approaches of U.S. agencies and those of their foreign counterparts might not be necessary and might impair the ability of American businesses to export and compete internationally. In meeting shared challenges involving health, safety, labor, security, environmental, and other issues, international regulatory cooperation can identify approaches that are at least as protective as those that are or would be adopted in the absence of such cooperation. International regulatory cooperation can also reduce, eliminate, or prevent unnecessary differences in regulatory requirements.

NHTSA is not aware of any conflicting regulatory approach taken by a foreign government concerning the subject matter of this rulemaking.

C. Regulatory Flexibility Act

In compliance with the Regulatory Flexibility Act, 5 U.S.C. 60l *et seq.,* NHTSA has evaluated the effects of this action on small entities. I hereby certify that this rule would not have a significant impact on a substantial number of small entities. The final rule would affect manufacturers of motor vehicle light equipment, but the entities that qualify as small businesses would not be significantly affected by this rulemaking because the agency is restoring requirements that previously existed in an older version of the regulation. This rulemaking is not expected to affect the cost of manufacturing motor vehicle lighting equipment.

D. Executive Order 13132

NHTSA has examined today's rule pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments or their representatives is mandated beyond the rulemaking process. The agency has concluded that the rulemaking would not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The final rule would not have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

NHTSA rules can preempt in two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision: ''When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter.'' 49 U.S.C. 30103(b)(1). It is this statutory command by Congress that preempts any non-identical State legislative and administrative law addressing the same aspect of performance.

The express preemption provision set forth above is subject to a savings clause under which ''[c]ompliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law.'' 49 U.S.C. 30103(e) Pursuant to this provision, State common law tort causes of action against motor vehicle manufacturers that might otherwise be preempted by the express preemption provision are generally preserved. However, the Supreme Court has recognized the possibility, in some instances, of implied preemption of such State common law tort causes of action by virtue of NHTSA's rules, even if not expressly preempted. This second way that NHTSA rules can preempt is dependent upon there being an actual conflict between an FMVSS and the higher standard that would effectively be imposed on motor vehicle manufacturers if someone obtained a State common law tort judgment against the manufacturer, notwithstanding the manufacturer's compliance with the NHTSA standard. Because most NHTSA standards established by an FMVSS are minimum standards, a State common law tort cause of action that seeks to impose a higher standard on motor vehicle manufacturers will generally not be preempted. However, if and when such a conflict does exist—for example, when the standard at issue is both a minimum and a maximum standard—the State common law tort cause of action is impliedly preempted. See *Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000).

Pursuant to Executive Order 13132 and 12988, NHTSA has considered whether this rule could or should preempt State common law causes of action. The agency's ability to announce its conclusion regarding the preemptive effect of one of its rules reduces the likelihood that preemption will be an issue in any subsequent tort litigation.

To this end, the agency has examined the nature (e.g., the language and structure of the regulatory text) and objectives of today's rule and finds that this rule, like many NHTSA rules, prescribes only a minimum safety standard. As such, NHTSA does not intend that this rule preempt state tort law that would effectively impose a higher standard on motor vehicle manufacturers than that established by today's rule. Establishment of a higher standard by means of State tort law would not conflict with the minimum standard announced here. Without any conflict, there could not be any implied preemption of a State common law tort cause of action.

E. National Environmental Policy Act

NHTSA has analyzed this final rule for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action would not have any

significant impact on the quality of the human environment.

F. Paperwork Reduction Act

Under the procedures established by the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. This final rule would not establish any new information collection requirements.

G. National Technology Transfer and Advancement Act

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Public Law 104–113), ''all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments.'' This Final Rule would not adopt or reference any new industry or consensus standards that were not already present in FMVSS No. 108.

H. Civil Justice Reform

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, ''Civil Justice Reform'' (61 FR 4729, February 7, 1996) requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement.

Pursuant to this Order, NHTSA notes as follows. The preemptive effect of this final rule is discussed above. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

I. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than $100 million annually (adjusted for inflation with base year of 1995). This final rule would not result in expenditures by State, local or tribal governments, in the aggregate, or by the private sector in excess of $100 million annually.

J. Executive Order 13211

Executive Order 13211 (66 FR 28355, May 18, 2001) applies to any rulemaking that: (1) Is determined to be economically significant as defined under E.O. 12866, and is likely to have a significantly adverse effect on the supply of, distribution of, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. This rulemaking is not subject to E.O. 13211.

K. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

L. Privacy Act

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (70 FR 19477–19478).

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, and Tires.

In consideration of the foregoing, NHTSA amends 49 CFR part 571 as set forth below.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

■ 1. The authority citation for Part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

■ 2. Section 571.108 is amended by adding paragraphs S14.4.1.3.2.4, S14.4.1.3.2.5, S14.4.1.4.2.4, S14.1.4.2.5, and S14.4.1.4.2.6 to read as follows:

§ 571.108 Standard No.108; Lamps, reflective devices, and associated equipment.

* * * * *

S14.4.1.3.2.4 Green. Green is not acceptable if it is less saturated (paler), yellower, or bluer than the limit standards.

S14.4.1.3.2.5 Blue. Blue is not acceptable if it is less saturated (paler), greener, or redder than the limit standards.

* * * * *

S14.4.1.4.2.4 Green. The color of light emitted must fall within the following boundaries:

y = 0.73 − 0.73x (yellow boundary)
x = 0.63y − 0.04 (white boundary)
y = 0.50 − 0.50x (blue boundary)

S14.4.1.4.2.5 Restricted Blue. The color of light emitted must fall within the following boundaries:

y = 0.07 + 0.81x (green boundary)
x = 0.40 − y (white boundary)
x = 0.13 + 0.60y (violet boundary)

S14.4.1.4.2.6 Signal Blue. The color of light emitted must fall within the following boundaries:

y = 0.32 (green boundary)
x = 0.16 (white boundary)
x = 0.40 − y (white boundary)
x = 0.13 + 0.60y (violet boundary)

* * * * *

Issued on: November 28, 2012.

David L. Strickland,

Administrator.

[FR Doc. 2012–29284 Filed 12–3–12; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 120321209–2643–02]

RIN 0648–BC08

Fisheries of the Northeastern United States; Atlantic Mackerel, Squid, and Butterfish Fisheries; Framework Adjustment 5

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS is broadening the scope of individuals and entities approved to complete vessel fish hold capacity certifications for vessels issued Tier 1 and 2 limited access Atlantic mackerel permits under the Atlantic

List of Subjects in 48 CFR Parts 2, 11, 23, and 52

Government procurement.

Dated: July 6, 2011.

Laura Auletta,

Acting Director, Office of Governmentwide Acquisition Policy, Office of Acquisition Policy.

Therefore, DoD, GSA, and NASA propose amending 48 CFR parts 2, 11, 23, and 52 as set forth below:

1. The authority citation for 48 CFR parts 2, 11, 23, and 52 continues to read as follows:

Authority: 40 U.S.C. 121(c); 10 U.S.C. chapter 137; and 42 U.S.C. 2473(c).

PART 2—DEFINITIONS OF WORDS AND TERMS

§ 2.101 [Amended]

2. Amend section 2.101 by removing from paragraph (b)(2), in the definition ''biobased product'', the words ''(including plant, animal, and marine materials) or'' and adding ''and'' in its place.

PART 11—DESCRIBING AGENCY NEEDS

3. Amend section 11.302 by revising paragraph (c)(2) to read as follows:

§ 11.302 Policy.

* * * * *

(c) * * *

(2) For biobased products, agencies may not require, as a condition of purchase of such products, the vendor or manufacturer to provide more data than would typically be provided by other business entities offering products for sale to the agency, other than data confirming the biobased content of a product (see 7 CFR 2902.8).

PART 23—ENVIRONMENT, ENERGY AND WATER EFFICIENCY, RENEWABLE ENERGY TECHNOLOGIES, OCCUPATIONAL SAFETY, AND DRUG-FREE WORKPLACE

§ 23.404 [Amended]

4. Amend section 23.404 by removing from paragraph (e)(1) the words ''(including plant, animal, and marine materials)''.

5. Amend section 23.405 by revising paragraph (a)(2) and adding (a)(3) to read as follows:

§ 23.405 Procedures.

(a) * * *

(2) *Biobased products.* Contracting officers should refer to USDA's list of USDA-designated items (available through the Internet at *http://www.biopreferred.gov*) and to their agencies' affirmative procurement program when purchasing supplies that contain biobased material or when purchasing services that could include supplies that contain biobased material.

(3) When acquiring recovered material or biobased products, the contracting officer may request information or data on such products, including on the recycled or biobased content or related standards of the products (see 11.302(c)).

* * * * *

§ 23.406 [Amended]

6. Amend section 23.406 by removing from paragraph (b) ''*http://www.usda.gov/biopreferred*'' and adding ''*http://www.biopreferred.gov*'' in its place.

PART 52—SOLICITATION PROVISIONS AND CONTRACT CLAUSES

7. Amend section 52.223–2 by—

a. Revising the date of the clause;

b. Removing from paragraph (b) ''*http://www.usda.gov/biopreferred*'' and adding *http://www.biopreferred.gov* in its place; and

c. Adding paragraphs (c) and (d) to read as follows:

52.223–2 Affirmative Procurement of Biobased Products Under Service and Construction Contracts

* * * * *

Affirmative Procurement of Biobased Products Under Service and Construction Contracts (Date)

* * * * *

(c) In the performance of this contract, the Contractor shall—

(1) Report to the cognizant Contracting Officer and the agency environmental manager on the product types and dollar value of any USDA-designated biobased products purchased by the Contractor during the previous year, between October 1 and September 30, in this contract;

(2) Submit this report no later than—

(i) October 31 of each year during contract performance; and

(ii) At the end of contract performance; and

(iii) Contact the cognizant environmental manager to obtain the preferred submittal format, if that format is not specified in this contract.

(d) The cognizant environmental manager for this contract is: _____. [*Contracting Officer shall insert full name, phone number, and email address or Web site for reporting.*]

[FR Doc. 2011–17453 Filed 7–12–11; 8:45 am]

BILLING CODE 6820–EP–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2011–0101]

RIN 2127–AK99

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

AGENCY: Department of Transportation (DOT), National Highway Traffic Safety Administration (NHTSA).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: NHTSA is proposing to restore the blue and green color boundaries to Federal Motor Vehicle Safety Standard (FMVSS) No. 108, *Lamps, Reflective Devices and Associated Equipment,* that were removed when the agency published a final rule reorganizing the standard on December 4, 2007.

DATES: Comments to this proposal must be received on or before September 12, 2011.

ADDRESSES: You may submit comments, identified by the docket number in the heading of this document, by any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov.* Follow the instructions for submitting comments on the electronic docket site by clicking on ''Help'' or ''FAQ.''
- *Mail:* Docket Management Facility, M–30, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building, Ground Floor, Room W12–140, Washington, DC 20590.
- *Hand Delivery:* U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building, Ground Floor, Room W12–140, between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.
- *Fax:* 202–493–2251.

Regardless of how you submit comments, you should mention the docket number of this document.

You may call the Docket Management Facility at 202–366–9826.

Instructions: For detailed instructions on submitting comments and additional information on the rulemaking process, see the Public Participation heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to *http://www.regulations.gov,* including any personal information provided.

Privacy Act: Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, *etc.*). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19477–78) or you may visit *http://www.dot.gov/privacy.html.*

Docket: For access to the docket to read background documents or comments received, go to *http://www.regulations.gov,* or the street address listed above. Follow the online instructions for accessing the dockets.

FOR FURTHER INFORMATION CONTACT: For technical issues: Mr. Markus Price, Office of Crash Avoidance Standards, NHTSA, 1200 New Jersey Avenue, SE., West Building, Washington, DC 20590 (*Telephone:* (202) 366–0098) (*Fax:* (202) 366–7002).

For legal issues: Mr. Thomas Healy, Office of the Chief Counsel, NHTSA, 1200 New Jersey Avenue, SE., West Building, Washington, DC 20590 (*Telephone:* (202) 366–2992) (*Fax:* (202) 366–3820).

SUPPLEMENTARY INFORMATION:

I. Background

NHTSA published a NPRM on December 30, 2005 [1] to reorganize FMVSS No. 108 and improve the clarity of the standard's requirements thereby increasing its utility for regulated parties. It was the agency's goal during the rewrite process to make no substantive changes to the requirements of the standard.

FMVSS No. 108 has been in existence since 1968. The standard had been amended on an *ad hoc* basis over time resulting in a patchwork organization of the standard. Regulated parties had stated that the standard was difficult to interpret because of its organization. In response to these concerns the agency sought to rewrite the standard to make it more understandable by adopting a simplified numbering scheme, to improve organization by grouping related materials in a more logical and consistent sequence, and to reduce the certification burden of regulated parties who previously needed to review a few dozen third-party documents. The agency issued the December 30, 2005, NPRM in an attempt to address these concerns.

Based on the comments received in response to the NPRM, NHTSA published a final rule on December 4, 2007,[2] amending FMVSS No. 108 by reorganizing the regulatory text so that it provides a more straightforward and logical presentation of the applicable regulatory requirements; incorporating important agency interpretations of the existing requirements; and reducing reliance on third-party documents incorporated by reference. The preamble of the final rule again stated that the rewrite of FMVSS No. 108 was administrative in nature and would have no impact on the substantive requirements of the standard. The final rule made several changes to the proposal contained in the NPRM including removing the blue and green color boundary requirements from paragraph S14.4.1.3.2.

On August 11, 2008, SABIC Innovative Plastics sent a letter to NHTSA claiming that the agency did not allow for public comment when it made the decision to remove the blue and green color boundaries from the standard. SABIC further argued that in removing the blue and green color boundaries from paragraph S14.4.1.3.2, the agency substantively changed the requirements of FMVSS No. 108 during the rewrite process.

II. Green and Blue Color Boundaries

Previous to the rewrite of the standard, paragraph S5.1.5 of FMVSS No. 108 required that the color of all lamps required by the standard comply with SAE J578c, *Color Specification for Electric Signal Lighting Devices,* (FEB 1977). SAE J578c contained color boundary definitions for red, yellow, white, green, restricted blue, and signal blue light. The NPRM included the boundary definition for the colors blue and green, but left out restricted blue. In the final rule the agency removed the color boundary definitions for green and blue from paragraph S14.4.1.3.2, retaining only the definitions for the red, yellow, and white color boundaries.

The agency is aware that, although neither blue nor green are directly used within the standard, it is possible to use these color boundaries to certify a material to the outdoor exposure test located in the paragraphs of S14.4.2.2. Prior to the reorganization final rule, a manufacturer could separately certify both a clear (white) material and a blue material to the haze test. The blue material alone could not be used in a lamp because the lamp itself would not emit the color of light required by the standard (only white, amber, and red lights are permitted). Once individually certified to the three year haze test, however, the blue and clear material could be mixed to produce a clear material with a blue tint, which could then be used in a lamp lens provided the lamp itself emits light within the white color boundary. Under the standard, the mixed material can be certified to the haze test without an additional three years of testing.

The agency recognizes that removing the color definitions for blue and green creates a substantive change to the requirements of FMVSS No. 108. Since it was not the agency's intention to create any substantive modifications to the standard, as stated in the NPRM and preamble of the final rule, the agency is proposing to amend FMVSS No. 108 to add color boundary definitions for green, restricted blue and signal blue so that the requirements of the rewrite coincide with those of the old standard. Further, the agency notes that these additional color boundary definitions have no impact on color that any lamp must emit. The agency is not proposing to change the color requirements for any lamp mandated by FMVSS No. 108.

III. Costs, Benefits, and the Proposed Compliance Date

Because this proposal only restores an existing requirement to the standard, the agency does not anticipate that there would be any costs or benefits associated with this rulemaking action. Accordingly, the agency did not conduct a separate economic analysis for this rulemaking.

The agency proposes an effective date of December 1, 2012, should a final rule be issued, to coincide with the effective date of the FMVSS No. 108 administrative rewrite.

IV. Public Participation

How do I prepare and submit comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments. Your comments must not be more than 15 pages long.[3] We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Please submit your comments by any of the following methods:

- *Federal eRulemaking Portal:* go to *http://www.regulations.gov.* Follow the instructions for submitting comments on the electronic docket site by clicking on ''Help'' or ''FAQ.''

[1] 70 FR 77454, (Dec. 30, 2005).

[2] 72 FR 68234, (Dec. 4, 2007).

[3] *See* 49 CFR 553.21.

• *Mail:* Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue, SE., Washington, DC 20590.
• *Hand Delivery or Courier:* West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue, SE., between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.
• *Fax:* (202) 493–2251.

If you are submitting comments electronically as a PDF (Adobe) file, we ask that the documents submitted be scanned using an Optical Character Recognition (OCR) process, thus allowing the agency to search and copy certain portions of your submissions.[4]

Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the Office of Management and Budget (OMB) and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at *http://www.whitehouse.gov/omb/fedreg/reproducible.html.* DOT's guidelines may be accessed at *http://dmses.dot.gov/submit/DataQualityGuidelines.pdf.*

How can I be sure that my comments were received?

If you submit your comments by mail and wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

How do I submit confidential business information?

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under **FOR FURTHER INFORMATION CONTACT**. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation.[5]

In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to the Docket by one of the methods set forth above.

Will the agency consider late comments?

We will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent possible, we will also consider comments received after that date. Therefore, if interested persons believe that any new information the agency places in the docket affects their comments, they may submit comments after the closing date concerning how the agency should consider that information for the final rule.

If a comment is received too late for us to consider in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

How can I read the comments submitted by other people?

You may read the materials placed in the docket for this document (*e.g.,* the comments submitted in response to this document by other interested persons) at any time by going to *http://www.regulations.gov.* Follow the online instructions for accessing the dockets. You may also read the materials at the Docket Management Facility by going to the street address given above under **ADDRESSES**. The Docket Management Facility is open between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.

V. Regulatory Notices and Analyses

A. Executive Order 12866, Executive Order 13563, and DOT Regulatory Policies and Procedures

NHTSA has considered the impact of this rulemaking action under Executive Order 12866, Executive Order 13563, and the Department of Transportation's regulatory policies and procedures. This rulemaking document was not reviewed by the Office of Management and Budget under E.O. 12866, ''Regulatory Planning and Review.'' It is not considered to be significant under E.O. 12866 or the Department's regulatory policies and procedures.

B. National Environmental Policy Act

We have reviewed this proposal for the purposes of the National Environmental Policy Act and determined that it would not have a significant impact on the quality of the human environment.

C. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.,* small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration's regulations at 13 CFR part 121 define a small business, in part, as a business entity ''which operates primarily within the United States.'' 13 CFR 121.105(a). No regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of the proposed rule under the Regulatory Flexibility Act. I certify that this proposed rule would not have a significant economic impact on a substantial number of small entities. This proposal restores the green and blue color boundaries contained in the currently applicable version of FMVSS No. 108 to the administrative rewrite of FMVSS No. 108 which has not yet taken effect. Accordingly, we do not anticipate that this proposal would have a significant economic impact on a substantial number of small entities.

D. Executive Order 13132 (Federalism)

NHTSA has examined today's final rule pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments or their representatives is mandated beyond the rulemaking process. The agency has concluded that the rulemaking would not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The final rule would not have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

E. Executive Order 12988 (Civil Justice Reform)

Pursuant to Executive Order 12988, ''Civil Justice Reform,'' [6] NHTSA has

[4] Optical character recognition (OCR) is the process of converting an image of text, such as a scanned paper document or electronic fax file, into computer-editable text.

[5] *See* 49 CFR part 512.

[6] 61 FR 4729 (Feb. 7, 1996).

considered whether this rulemaking would have any retroactive effect. This proposed rule does not have any retroactive effect.

F. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits, and other effects of a proposed or final rule that includes a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of more than $100 million in any one year (adjusted for inflation with base year of 1995).

Before promulgating a rule for which a written statement is needed, section 205 of the UMRA generally requires NHTSA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows NHTSA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the agency publishes with the final rule an explanation why that alternative was not adopted.

This proposed rule is not anticipated to result in the expenditure by state, local, or tribal governments, in the aggregate, or by the private sector in excess of $100 million annually. The cost impact of this proposed rule is expected to be $0. Therefore, the agency has not prepared an economic assessment pursuant to the Unfunded Mandate Reform Act.

G. Paperwork Reduction Act

Under the procedures established by the Paperwork Reduction Act of 1995 (PRA), a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. This proposed rule does not contain any collection of information requirements requiring review under the PRA.

H. Executive Order 13045

Executive Order 13045 [7] applies to any rule that: (1) Is determined to be economically significant as defined under E.O. 12866, and (2) concerns an environmental, health or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the proposed rule on children, and explain why the proposed regulation is preferable to other potentially effective and reasonably feasible alternatives considered by us.

This proposed rule does not pose such a risk for children. The primary effects of this proposal are to amend the lighting standard to restore the green and blue color boundaries.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) requires NHTSA to evaluate and use existing voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law (*e.g.,* the statutory provisions regarding NHTSA's vehicle safety authority) or otherwise impractical.

Voluntary consensus standards are technical standards developed or adopted by voluntary consensus standards bodies. Technical standards are defined by the NTTAA as ''performance-based or design-specific technical specification and related management systems practices.'' They pertain to ''products and processes, such as size, strength, or technical performance of a product, process or material.''

Examples of organizations generally regarded as voluntary consensus standards bodies include the American Society for Testing and Materials (ASTM), the Society of Automotive Engineers (SAE), and the American National Standards Institute (ANSI). If NHTSA does not use available and potentially applicable voluntary consensus standards, we are required by the Act to provide Congress, through OMB, an explanation of the reasons for not using such standards.

This proposal would not adopt or reference any new industry or consensus standards that were not already present in FMVSS No. 108.

J. Executive Order 13211

Executive Order 13211 [8] applies to any rule that: (1) Is determined to be economically significant as defined under E.O. 12866, and is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. If the regulatory action meets either criterion, we must evaluate the adverse energy effects of the proposed rule and explain why the proposed regulation is preferable to other potentially effective and reasonably feasible alternatives considered by NHTSA.

This proposal restores the green and blue color boundaries contained in the currently applicable version of FMVSS No. 108 to the administrative rewrite of FMVSS No. 108 which has not yet taken effect. Therefore, this proposed rule will not have any adverse energy effects. Accordingly, this proposed rulemaking action is not designated as a significant energy action.

K. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

L. Plain Language

Executive Order 12866 requires each agency to write all rules in plain language. Application of the principles of plain language includes consideration of the following questions:

- Have we organized the material to suit the public's needs?
- Are the requirements in the rule clearly stated?
- Does the rule contain technical language or jargon that isn't clear?
- Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?
- Would more (but shorter) sections be better?
- Could we improve clarity by adding tables, lists, or diagrams?
- What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this proposal.

M. Privacy Act

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an organization, business, labor union, *etc.*). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you

[7] 62 FR 19885 (Apr. 23, 1997).

[8] 66 FR 28355 (May 18, 2001).

may visit *http://www.dot.gov/privacy.html*.

In consideration of the foregoing, NHTSA proposes to amend 49 CFR part 571 as set forth below.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, 30166; delegation of authority at 49 CFR 1.50.

§ 571.108 [Amended]

Section 571.108 is amended effective December 1, 2012 by adding paragraphs S14.4.1.4.2.4, S14.1.4.2.5, and S14.4.1.4.2.6 to read as follows:

* * * * *

S14.4.1.4.2.4 Green. The color of light emitted must fall within the following boundaries:

$y = 0.73 - 0.73x$ (yellow boundary);

$y = 0.50 - 0.50x$ (blue boundary);

$x = 0.63y - 0.04$ (white boundary).

S14.4.1.4.2.5 Restricted Blue. The color of light emitted must fall within the following boundaries:

$y = 0.07 + 0.81x$ (green boundary);

$x = 0.40 - y$ (white boundary);

$x = 0.13 + 0.60y$ (violet boundary).

S14.4.1.4.2.6 Signal Blue. The color of light emitted must fall within the following boundaries:

$y = 0.32$ (green boundary);

$x = 0.40 - y$ (white boundary);

$x = 0.16$ (white boundary);

$x = 0.13 + 0.60y$ (violet boundary).

* * * * *

Issued on: July 7, 2011.

Christopher J. Bonanti,

Associate Administrator for Rulemaking.

[FR Doc. 2011–17658 Filed 7–12–11; 8:45 am]

BILLING CODE 4910–59–P

October 22, 2013

The Honorable David L. Strickland
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue S.E., West Building
Washington D.C. 20590-0001

RE: Notice of update of SAE J576 to include specification for Diffusion Polymers for automotive lighting applications

Dear Administrator Strickland:

The purpose of this letter is to provide notification of an update to SAE J576-*Plastic Material or Materials for Use in Optical Parts Such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices*, effective February 2010. This updated version of J576 includes a method to evaluate "degradation in performance caused by weathering exposure of diffusion material(s) that cannot be measured by current test methods."

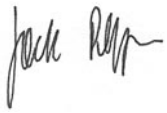
The changes in SAE J576 (FEB 2010) provide for the use of controlled light scattering plastic materials, herein referred to as Diffusing Plastic Materials. Diffusing Plastic Materials intentionally scatter transmitted light to specific intended levels as defined in SAE J576 (FEB 2010) as having an initial unexposed haze value greater than 30% when measured in accordance with ASTM D1003. The ASTM D1003 scope does not allow for materials with measured values greater than 30%. Diffusing Plastic Materials cannot be evaluated for durability using the conventional "increase of haze" methodology since measurement of haze of Diffusing Plastic Materials is not within the scope of ASTM D1003. This new evaluation methodology is limited to Diffusing Plastic Materials only and requires a more stringent maintenance of luminous transmittance. All other existing exposure, testing and requirements remain unchanged for all materials. No other changes have been made or allowed in the February 2010 revision for transparent plastic materials. Definitions have been incorporated as necessary to define this Diffusing Plastic Materials.

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e customerservice@sae.org

SAE and the SAE Lighting Systems Group believe that this revised document strives to maintain the relevance of standards within the context of changing technologies in the automotive lighting field that could not be anticipated or addressed at the time of the publication of the existing text (SAE J576 JUL91). SAE and the SAE Lighting Systems Group further believe that if and when NHTSA amends the current FMVSS lighting standard, referencing SAE J576 (FEB 2010) would benefit the safety of the public as well as that of the automotive industry.

Sincerely,



Jack Pokrzywa
Business Unit Leader
Global Ground Vehicle Standards

cc: Mr. Timothy P. Mellon, Director, Government Affairs, SAE International
Mr. Bart P. Terburg, Chairman, SAE Lighting Systems Group

U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

NOV 6 2009

1200 New Jersey Avenue SE.
Washington, DC 20590

Mr. Jim Wilson
Marketing Director, Lighting
Sabic Innovative Plastics
Two Towne Square
Southfield, MI 48076

Dear Mr. Wilson:

This responds to your letter regarding requirements for inner lenses in Federal Motor Vehicle Safety Standard (FMVSS) No. 108, Lamps, Reflective Devices, and Associated Equipment. Specifically, you asked whether inner lenses are subject to certain performance requirements of the version of FMVSS No. 108 that are scheduled to take effect on December 1, 2009. The answer is that inner lenses are required to meet the haze test requirements, similar to the way they are in the currently applicable version of FMVSS No. 108.

By way of background, the National Highway Traffic Safety Administration (NHTSA) is authorized by the National Traffic and Motor Vehicle Safety Act (Safety Act) to issue FMVSSs that set performance requirements for new motor vehicles and new items of motor vehicle equipment (see 49 U.S.C. Chapter 301). NHTSA does not provide approvals of motor vehicles or motor vehicle equipment. Instead, manufacturers are required to self-certify that their products conform to all applicable safety standards that are in effect on the date of manufacture. NHTSA selects a sampling of new vehicles and equipment each year to determine their compliance with applicable FMVSSs. If our testing or examination reveals an apparent noncompliance, we may require the manufacturer to remedy the noncompliance, and may initiate an enforcement proceeding if necessary to ensure that the manufacturer takes appropriate action.

In your letter, you state you seek confirmation that FMVSS No. 108 does not require plastic materials used for inner lenses to meet the performance requirements in S14.4.2.2.4 when they are covered by outer material meeting the requirements of that section and not exposed directly to sunlight. Neither the currently applicable version of FMVSS No. 108, nor the version of the standard that becomes effective on December 1, 2009 (hereinafter, "the rewrite)," supports that position.

For reference, paragraph S5.1.2 of FMVSS No. 108 reads as follows:

> S5.1.2 Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE Recommended Practice J576 JUL91, except that:
> (a) Plastic lenses (other than those incorporating reflex reflectors) used for inner lenses or those covered by another material and not exposed directly to sunlight *shall meet the requirements* of paragraphs 3.3 and 4.2 of SAE J576 JUL91 *when covered by the outer lens or other material*; [emphasis added][1] . . . .

We interpret this requirement as follows. The requirement in S5.1.2 which states that plastic materials shall conform to SAE J576 JUL91 is the general requirement. The subparagraphs ((a) through (g)), are exceptions to this requirement. Therefore, the exception described in subparagraph (a) requires plastic lenses used for inner lenses to meet the specifications of paragraphs 3.3 and 4.2 of SAE J576 JUL91 *while covered by the outer lens*. This is instead of being required to meet these specifications while directly exposed to sunlight.[2] The inner lenses are not, as you suggest, fully excluded from the general test requirements in S5.1.2.

We believe that the relevant paragraph S14.4.2.2.4 in the rewrite is substantively identical. For reference, that paragraph reads as follows:

> S14.4.2.2.4 *Performance requirements.* Plastic lenses, other than those incorporating reflex reflectors, used for inner lenses or those covered by another material and not exposed directly to sunlight must meet the optical material test requirements when covered by the outer lens or other material.

We interpret this paragraph to establish the same requirements as paragraph S5.1.2 and S5.1.2(a) in the current standard. With regard to plastic used for inner lenses, and not exposed directly to sunlight, they must "meet the optical material test requirements" when covered by the outer lens. This is the same as is currently required by FMVSS No. 108.

You also provide an analysis as to why you believe that inner lenses are not required to be certified to the specifications of S5.1.2. We respond to that analysis below.

In your letter, you state that in a 1970 final rule (35 FR 16840, October 31, 1970), NHTSA "made clear that inner lenses would be considered to be protected when covered by an outer lens and not directly exposed to sunlight." We have reviewed the final rule at

---

[1] For reference, paragraphs 3.3 and 4.2 of SAE Recommended Practice J576, "Plastic Materials for Use in Optical Parts such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices," revised July 1991, relate to the "Outdoor Exposure Tests" and the "After Outdoor Exposure" requirements, respectively. SAE J576 has been incorporated by reference into FMVSS No. 108.

[2] The language in paragraph 3.3 of SAE J576 JUL91 does not specify that protected inner lenses can be covered by the outer lens during the outdoor exposure tests. It specifies a shorter, but otherwise similar, outdoor exposure test than the one for exposed outer lenses.

issue and have not found a relevant difference between that version and the current version. It too states that "[p]lastic materials used as inner lenses... and not exposed directly to sunlight shall meet the requirements of paragraphs 3.4 and 4.2 of SAE J576b when covered by the outer lens or other material."[3]

Finally, we note you argued that "the fact that inner lenses are 'protected' is critical when applying the SAE Recommended Practice upon which the standard is based." We agree that the lenses you describe in this letter would be considered "protected." However, merely because a lens is protected does not mean it is not subject to a weathering test. Instead, according to the SAE Recommended Practice referenced in FMVSS No. 108 (SAE J576 JUL91), protected lenses are subject to test requirements – albeit less stringent requirements than "exposed" lenses (a 6-month weathering period, instead of 3 years).

If you have any further questions, please contact Ari Scott of my staff at (202) 366-2992.

Sincerely,

O. Kevin Vincent
Chief Counsel

[3] 70 FR 16843.

ATLAS
MATERIAL TESTING SOLUTIONS

ACCELERATING YOUR EXPERTISE

Helping You Put Your Products To The Test



THE GLOBAL LEADER IN PRODUCT DURABILITY, PERFORMANCE & WEATHERING TESTING INSTRUMENTS & SERVICES

AMETEK
MEASUREMENT & CALIBRATION TECHNOLOGIES

Instruments

Accelerated Weathering ❖ Corrosion ❖ Flammability ❖ Solar Environmental ❖ Technical Lighting

Ci Series Weather-Ometers



Atlas' flagship accelerated weathering instruments offer superior performance, innovative features, and large capacity.

- Water-cooled xenon arc lamps and advanced filter technology deliver the best simulation of natural sunlight
- Best-in-class uniformity for irradiance, temperature, relative humidity and spray
- Intuitive touch screen controls
- Custom testing capabilities

SUNTEST® Family



The most widely used flatbed xenon test chambers available in tabletop or free standing models to meet lower testing capacity needs. Features include:

- Optical light filters to simulate indoor/outdoor sunlight
- A variety of accessories ideal for testing realistic end-use conditions
- Best-in-class flatbed irradiance and temperature uniformity

Xenotest® Instruments



These premium air-cooled accelerated weathering instruments offer an array of options to meet virtually all global weathering and lightfastness testing requirements.

- Designed with state-of-the-art controls
- On-rack radio-controlled sensor technology for superior monitoring of light and temperature
- High water and power efficiency

UVTest



An economical fluorescent/UV weathering test instrument for product screening at lower operating costs.

- Simple touch screen operation and control in several languages
- Patented irradiance calibration safety access ports
- Remote Ethernet data acquisition application
- Recirculating spray water option

Corrosion Cabinets



The most sophisticated and versatile corrosion and salt fog cabinets available. Capable of replicating automatic cycling between several environmental conditions to reduce the need to move or otherwise handle test specimens.

- Design maximizes testing volume
- Large solution reservoir
- Optional features allow for simulation of several environmental conditions

Flammability Chambers



Atlas flammability chambers offer unmatched accuracy, repeatability and safety when determining the burn rates and resistance of various materials.

- All chambers are easy to install and operate
- Specimen holders available to accommodate a variety of material types
- Chambers are available for appliance, aircraft and automotive applications

Solar Simulation Systems



Atlas Custom Systems designs and builds custom solar simulation systems such as walk-in chambers or full-scale test facilities. These full scale test facilities use a series of highly coordinated metal halide lights to provide uniform radiant energy to meet the demanding testing needs of many industries.

Solar Environmental Chambers



A group of integrated, easy-to-use test chambers for various solar and environmental applications. These instruments combine environmental simulation with metal halide lighting technology and are ideal for testing medium to large sized automotive, plastics, electronics and 3D components, finished products as well as PV modules.

Technical Lighting Systems



Atlas/KHS technical lighting systems are designed for high-speed photography and video. These systems are ideal for crash testing and other safety experiments, custom designed to match the complex illumination requirements of various test configurations. Available with conventional HMI light sources or the latest LED technology, these lighting systems offer an array of solutions for analytical testing of high speed events.

Our mission is to help our customers worldwide provide the most reliable and durable product solutions through our combined experience and expertise in weathering instruments and testing, custom capabilities, consulting and global support.

Services

Natural & Accelerated Weathering Testing ❖ Evaluations ❖ Consulting ❖ Technical Support ❖ Client Education

Natural Weathering Services



Atlas offers outdoor weathering sites worldwide to ensure factors from a variety of climates can be tested.

- Static Exposure Testing
- Sun Tracking Exposure Testing
- EMMAQUA® Accelerated Outdoor Testing
- Ultra-Accelerated Weathering Testing
- Automotive Exposure Testing (Samples, Components, Complete Vehicles)

Accelerated Laboratory Weathering Services



Atlas Weathering Services Group operates one of the largest networks of ISO/IEC 17025 accredited accelerated weathering testing laboratories in the world. Our indoor exposure labs offer artificial accelerated weathering tests and a variety of other environmental test programs, all designed to accurately simulate true end-use conditions and meet global weathering standards.

Evaluation Services



Atlas offers a wide range of evaluation and measurement services for your specimens during and after the weathering process.

- Instrumental Color/Gloss Measurements
- Visual Evaluations
- Photography/IR Imaging
- Emittance
- Spectral Transmittance/Reflectance
- Solar Reflectance Index
- Additional Optical Property Measurements

Consulting Solutions



Atlas Consulting Solutions offers design and implementation of environmental durability testing methods, programs, and strategies. Our international group of weathering experts help you achieve your objectives through all stages of the value chain from materials to components, systems to end-use products.

Worldwide Technical Support



Proper maintenance is critical in order for your instrument to operate at peak performance. Atlas' AMECARE Performance Services Program ensures that your instrument will operate optimally at all times. Benefits include:

- Preventative maintenance inspections
- Scheduled ISO accredited calibrations (where available)
- Detailed service reports with professional assessment of key components

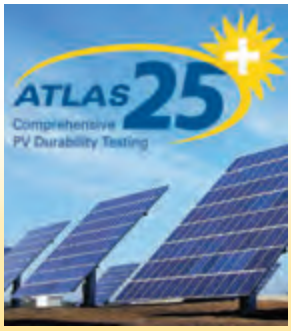
Client Education & Training



Atlas offers an array of resources designed to advance your weathering education and provide you with the knowledge you need to successfully meet your testing requirements. Events include:

- Seminars
- Workshops
- Webcasts
- In-House Programs
- Technical Conferences

Solar Industry Solutions



Atlas offers a complete portfolio of testing services to evaluate the performance, durability and reliability of solar cells, modules, complete arrays, concentrated solar power products and solar thermal collectors. Atlas also offers its proprietary Atlas 25+® long-term durability testing program for solar modules.

ATLAS
MATERIAL TESTING SOLUTIONS

Ultra-Accelerated EMMA®









AMETEK®
MEASUREMENT & CALIBRATION
TECHNOLOGIES

THE BENEFITS OF ULTRA-ACCELERATED TESTING

What is the Ultra-Accelerated EMMA®?

The Ultra-Accelerated EMMA (UA-EMMA) is Atlas' latest advancement in natural exposure testing. This new outdoor testing device delivers approximately 10-12 years of equivalent radiation exposure as would be received in a standard outdoor testing rack in South Florida in a single year.

The system achieves this accelerated exposure through a patented "cool mirror" technology that has very high reflectance in the UV and near visible wavelength ranges while attenuating reflectance in the longer wavelength visible and IR portions of the solar spectrum.

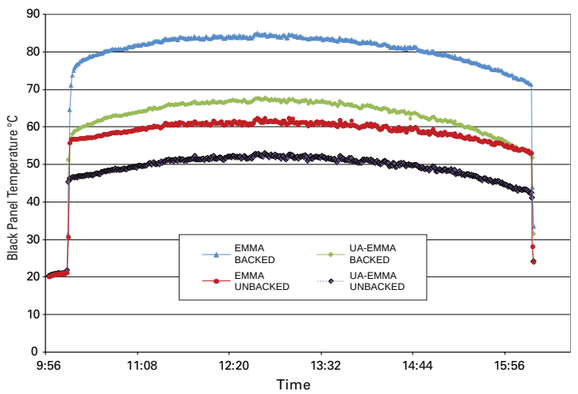


What are the Advantages?

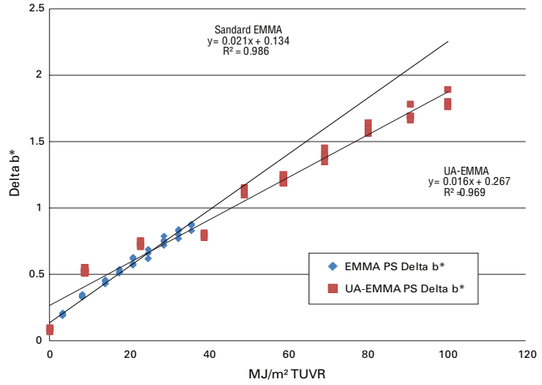
The new UA-EMMA system allows for greatly accelerated testing while fulfilling three critical testing requirements:

- Exposes many different types of materials to ultra-high UV irradiance
- Maintains high fidelity to the natural solar UV spectrum
- Keeps specimens at acceptable exposure temperatures

Black Panel Temperature Performance
UA-EMMA vs. Standard EMMA Data



Comparison of Polystyrene (PS) Reference Material in Standard EMMA and UA-EMMA by UV Radiant Exposure



Ideal Materials for UA-EMMA® Testing

- Materials that require a long service life
- Transparent and glazed materials
- Temperature sensitive materials such as PVC
- Coatings applied to metal panels
- Materials that perform well in EMMA or EMMAQUA exposure testing

EMMAQUA® Weathering Standards

The table below lists selected standards for EMMAQUA exposure. For details, refer to the individual standards. Test methods which are proprietary to individual companies and which also specify Fresnel-based exposure methods are not listed here.

EMMAQUA STANDARD	SCOPE	COUNTRY
ISO 877-3	Plastics	International
ASTM D3841	Glass-fiber reinforced polyester	USA
ASTM D4141	Coatings	USA
ASTM D4364	Plastics	USA
ASTM D5722	Coated hardboard	USA
ASTM E1596	PV modules	USA
ASTM G90	Non-metallic materials	USA
SAE J576	Optical automotive plastics	USA
SAE J1961	Automotive exterior	USA
SAE-AMS-T-22085	Preservation sealing tape	USA
JIS Z2381	General	Japan

Applications

- Adhesives
- Agricultural Films
- Automotive Exteriors
- Building Materials
- Elastomers
- Glass (Architectural & Automotive)
- Packaging
- Paints & Coatings
- Plastics
- Roofing
- Sealants



1958



The first EMMAQUA® device, constructed with a wooden frame and sheet metal skin, is patented, manufactured and placed into service.

1969

Atlas' DSET Laboratories relocates from Phoenix to New River, Arizona. The EMMAQUA device is redesigned with a steel framework and more efficient spray delivery system.



1986



EMMAQUA+®, the next generation of accelerated weathering devices, is introduced. Advancements include individual cycle programming, black panel temperature control, and altazimuth solar tracking for more efficient delivery of full-spectrum solar energy.

1999

The MQ3K is launched, utilizing state-of-the-art technology in computer-controlled cycle programming, more accurate altazimuth solar tracking, one-touch start/stop, error sensing feedback and the most-specular mirrors available.



2004



Atlas introduces four patented suites of Temperature-Controlled EMMAQUA. (Static, Night, Dynamic Temperature and Variable Irradiance Control). This breakthrough allows for the testing of materials that are sensitive to thermal buildup.

2014

Atlas introduces the UA-EMMA, the latest advancement in outdoor accelerated testing. This device couples the EMMA platform with a new patented mirror system, optimizing real-world correlation.





Global Support, Weathering Exposure Sites & Laboratories

■ Corporate Offices

Chicago, Illinois USA ■ Linsengericht, Germany ■ Shanghai, China ■ São Paulo, Brazil
Élancourt, France ■ Mörfelden-Walldorf, Germany ■ Bangalore, India ■ Leicester, United Kingdom

● Outdoor Exposure Sites & Laboratories

Miami, Florida USA • Phoenix, Arizona USA • Sanary, France • Chicago, Illinois USA• Duisburg, Germany • Leicester, United Kingdom
Hoek van Holland, The Netherlands • Chennai, India • Prescott, Arizona USA • Loveland, Colorado USA • Medina, Ohio USA
Keys, Florida USA • Jacksonville, Florida USA • Alberta, Michigan USA • Hainan, China • Guangzhou, China
Seosan, Korea • Miyakojima, Okinawa, Japan • Choshi, Japan • Kirishima, Japan
Singapore • Melbourne, Australia • Townsville, Australia • Novorossiysk, Russia
Gelendzhik, Russia • Moscow, Russia

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www.aztest.com



Q-Lab Test Services

- Florida & Arizona Outdoor Exposures
- Accelerated Laboratory Testing
- Evaluations

Q-LAB

Weathering & Outdoor Climatic Testing

If you're concerned about your product's appearance or functional performance in the outdoor environment, you're not alone. Sunlight, heat, and moisture cause billions of dollars in product damage every year. A proper weathering testing program can help you anticipate and prevent a variety of potential product failures, meet durability specifications, and preserve your reputation for quality.

Will your product last outdoors? Don't guess when you can test!



















WHY TEST?

Reliable weathering and corrosion data can help you:

- Avoid unexpected product failures
- Make the best material selection decisions
- Validate new or less-expensive materials or additives
- Improve your competitive advantage
- Warranty your product's lifetime with confidence

Natural outdoor weathering and corrosion testing give the most realistic prediction of product performance. Accelerated testing, available both outdoors and in the laboratory, gives faster results but with some uncertainty about its accuracy. Many companies combine both approaches to ensure reliable results in the shortest time possible.

WHY CHOOSE Q-LAB?

Experienced and Reliable

Q-Lab provides the highest-quality weathering testing services. Our first natural weathering site opened in 1959. Today, our scientists and engineers participate and offer leadership in ISO, ASTM, IEC, GB, and numerous other professional organizations in creating standardized test methods and procedures.

Instant Credibility

When Q-Lab does your testing, the results have instant credibility with your customers and colleagues. Q-Lab conducts all exposure tests and evaluations in accordance with appropriate test methods from ASTM, ISO, BSI, DIN, JIS, SAE, GB, and other recognized organizations and is accredited by AMECA and AAMA.

Cost-Effective

Q-Lab's state-of-the-art test services are available at a surprisingly affordable price. In many cases, it is less costly to test with Q-Lab than to set up and run tests yourself.

Best Test Sites, Best Technology

South Florida and Arizona, where Q-Lab does most of its outdoor testing, have been recognized for over a century as harsh climates for product testing. If your products perform well in these benchmark locations, they will perform well just about anywhere. Q-Lab uses the most trusted accelerated weathering and corrosion technologies, used by thousands of companies in dozens of industries.

Natural Outdoor Testing

Location is everything. About one hundred years ago, companies in the paint and automotive industries realized that environmental conditions in South Florida and the Arizona desert were the harshest on their products. Several companies operated their own test sites in these locations, and they used what they learned to make their products durable enough to ensure generations of satisfied customers. Today, much of this testing has been consolidated at Q-Lab's sites in Florida and Arizona. Companies around the globe trust Q-Lab to perform their outdoor product testing.

FLORIDA

The subtropical climate of the Miami area has the perfect year-round combination of abundant sunlight, warm temperatures, and plentiful water. Sunshine during the summer months in Miami is quite similar to that of northern temperate regions. However, in the winter the difference is dramatic. The key point is that it is the same sun—just more of it, and for a longer duration each year. The same holds true for temperature, rainfall, dew, and humidity.

The result of this perfect combination of environmental factors is that exposures at Q-Lab Florida are accelerated compared to temperate climates. One year of Florida sunshine can produce the same weathering effects on materials as several years of weathering in most major markets around the world. Specimens that can withstand the sunlight, heat, and water in south Florida can be expected to be durable in most locations around the world.

SOUTH FLORIDA IS PERFECT FOR TESTING:

- Sunlight (UV) stability
- Moisture sensitivity
- Mildew/mold resistance
- Surface erosion
- High-temperature resistance
- Thermal shock response
- Corrosion behavior
- Moisture ingress
- Acid rain resistance



THE GLOBAL BENCHMARK
Q-Lab Florida has more specimens on test than any other outdoor weathering facility in the world.



DESERT TESTING
Arizona features even hotter temperatures and higher levels of sunlight than Florida.

ARIZONA

Arizona's desert climate is characterized by intense sunlight, very high temperatures, minimal rainfall, and very low humidity. Arizona desert exposures provide a different – in some ways harsher – exposure environment than Florida subtropical tests. Compared with Florida, Arizona is much hotter and receives about 15-20% more annual total solar and UV energy. Arizona experiences large day to night temperature variations, about 17 °C (31 °F) on average. Arizona receives little annual rainfall and has low atmospheric moisture overall. Specimens tested in the Arizona desert can be expected to have superior resistance to sunshine and elevated temperatures.

ARIZONA DESERT IS PERFECT FOR TESTING:

- Sunlight (UV) stability
- Heat aging effects
- Thermal expansion stress resistance
- Heat deflection and distortion
- Material durability in low humidity environments

OHIO

Northeast Ohio has a Northern Temperate climate, meaning it experiences four true seasons during the year. Outdoor specimens are subject to a range of exposures to UV light, temperature, and water, including regular freeze/thaw cycles during the winter.

Although Northeast Ohio testing will generally not attain the acceleration of natural outdoor testing in Florida or Arizona, it does deliver conditions experienced by much of the population of the United States and the rest of the world.

Some industries include a benchmark Northern Temperate climate in their certification programs, in addition to Florida and Arizona, to ensure a fully comprehensive program for natural weathering. Ohio is ideal for meeting these requirements.





Accelerated Laboratory Testing

Q-Lab offers a full range of accelerated laboratory weathering and corrosion testing services at our fully-equipped facilities in Florida and Germany. Q-Lab can perform most testing that utilizes xenon arc, fluorescent UV, salt spray, or cyclic corrosion chambers. Contract testing at Q-Lab is an ideal solution for companies that:

> Have a short-term need for testing but aren't ready to invest in facilities and equipment

> Need additional testing capacity that the in-house lab can't accommodate

> Have a special project with a new test cycle that can't be performed in-house

> Need third-party verification of test results

STANDARD & CUSTOM EXPOSURES

Tests and evaluations are performed to appropriate ASTM, ISO, EN, DIN, JIS, SAE, GB, AATCC, or other standard procedures.

Visit **Q-Lab.com/standards** or contact Q-Lab to discuss a particular standard.

We can also perform custom exposures to meet your individual testing needs. **More on page 13.**

TWO LABS, ONE STANDARD OF QUALITY

> Homestead, Florida USA
> Saarbrücken, Germany

Both locations follow the ISO 17025 accredited Quality System, ensuring the best care for your projects.



Homestead, Florida USA



Saarbrücken, Germany



RAPID RESULTS
Xenon arc test chambers are used to test colorants in paints and plastics.

TYPES OF ACCELERATED TESTS



XENON ARC WEATHERING

For weathering tests that require full sunlight simulation, the **Q-SUN** xenon arc weathering chamber can perform a variety of methods from the automotive, textile, building material, paint, plastics, personal care, or other industries. Xenon arc instruments are usually the best choice for applications where color change is the primary failure mode of concern.



FLUORESCENT UV WEATHERING

When changes to physical properties of polymeric materials are the concern, the **QUV** accelerated weathering tester is an effective tool for comparative testing. Fluorescent UV lamps match the most damaging portion of the sunlight spectrum (UVA and UVB), reproduce degradation from germidical treatments (UVC), or simulate indoor environments (Cool White).



SALT SPRAY/ CYCLIC CORROSION

Q-FOG cyclic corrosion chambers can perform any test from simple salt spray to tests with precise control of RH and moisture transitions, which is required by most OEM automotive standards. In addition, certain models can also perform demanding modern test protocols like CASS and JASO M609.

Q-TRAC Natural Sunlight Concentrator Testing

Faster test, natural environment. Accelerated outdoor materials testing using a Q-TRAC natural sunlight concentrator delivers the benefits of testing in a natural outdoor environment while at the same time amplifying the sunlight and heat delivered to specimens. This testing is especially useful for highly-durable materials with long expected lifetimes.

SUPER-FAST RESULTS FROM NATURAL SUNLIGHT

The Q-TRAC delivers the same amount of damaging ultraviolet energy in just one year as specimens would experience in five years of Florida sunlight. Like other accelerated tests, sunlight concentrator testing allows products to be brought to market faster, but the Q-TRAC uses natural sunlight to reduce further the risk of generating erroneous test results. In this way, the Q-TRAC delivers dual benefits – the realism of natural exposures and the speed of accelerated laboratory tests.

Q-TRAC IS PERFECT FOR TESTING:

- Roofing
- Coil coatings
- Fluoropolymers
- Geosynthetics
- Powder coatings
- Building materials
- Industrial coatings
- Hardboard coatings

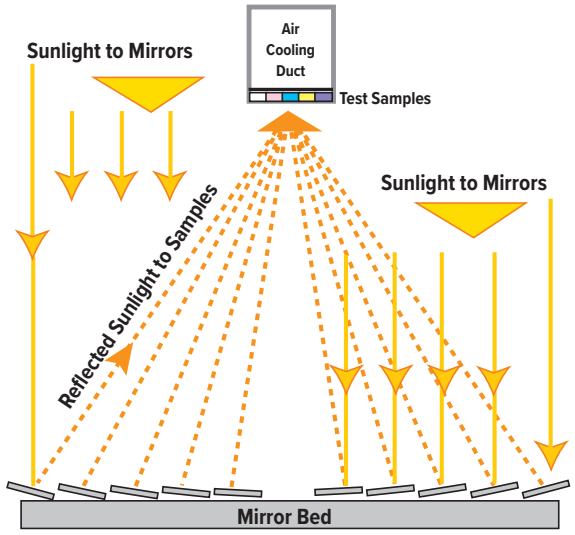
ONLY IN ARIZONA

Q-TRAC testing requires a high proportion of direct beam sunlight and low cloud cover that exists only in very dry environments.



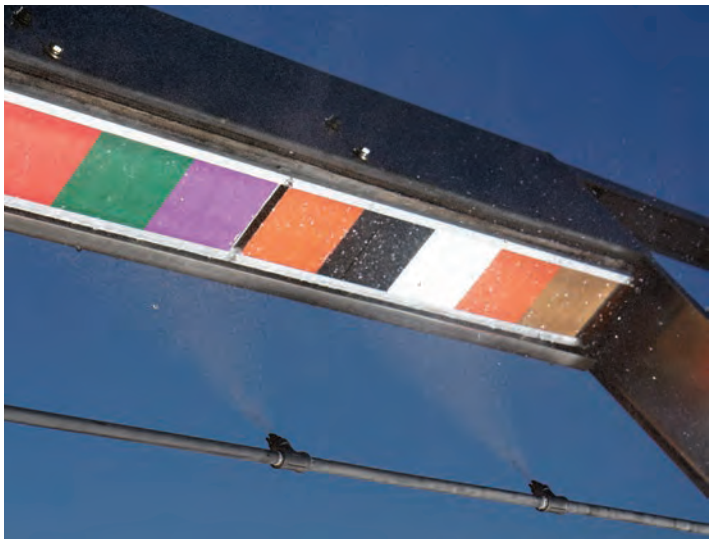
ENHANCED SUNLIGHT WITH CONCENTRATING MIRRORS

The Q-TRAC system uses an array of 10 flat mirrors to reflect and concentrate natural sunlight onto the test specimens. It further maximizes the exposure by automatically tracking the sun throughout the day in both azimuth (horizontal) and elevation (vertical).



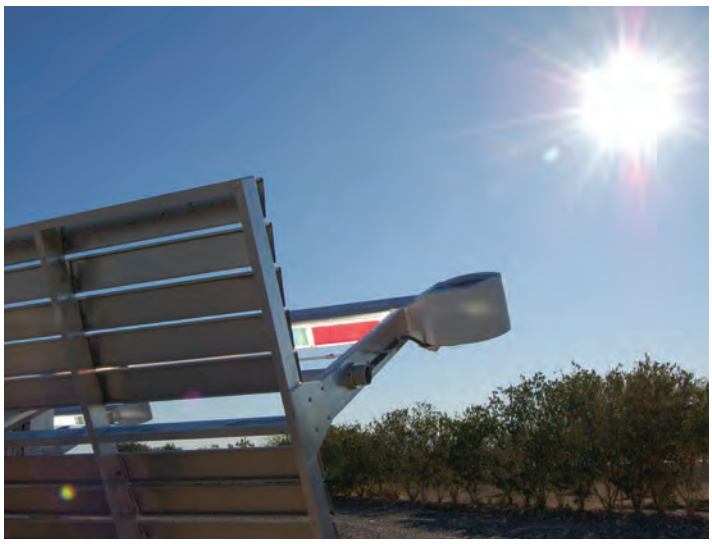
Q-TRAC WATER SPRAY & SPECIAL APPLICATIONS

Water spray during the night time can simulate the time of wetness experienced in Florida, and during the day it can simulate thermal shock associated with rain bursts. During night-time wetting, specimens are oriented facing upward to give increased wetness and realism compared to original natural sunlight concentrator testing. Q-Lab also offers temperature-controlled Q-TRAC testing for more heat-sensitive specimens.



Several standardized cycles—including desert, freeze/thaw, and spray are available to test different materials and end-use application. Standards include:

- ASTM G90
- ASTM D4141
- ASTM D4364
- ASTM D5105
- ASTM D5722
- SAE J1961
- SAE J576
- ISO 877-3
- AAMA 623, 624 and 625



Automotive Interior Testing

Accelerated testing to simulate behind-glass environments. Interior components in automobiles and other behind-glass environments can experience higher temperatures than materials in service outdoors. AIM box testing delivers high temperatures in combination with natural sunlight behind window glass for fast, realistic testing.

AIM BOX

An Automotive Interior Materials (AIM) box is an under-glass enclosure that simulates the sunlight and heat found inside an automobile. Although this technology was developed for the automotive industry, it can be very effective for many applications where glass-filtered sunlight and heat are important stressors, such as building window assemblies and electrical enclosures.

Key test standards for AIM box testing include GMW 14873, GMW 16717, GMW 3417, GM 2617M, GM 3619M, GM 7454M, GM 7455M, GM 9538P, Ford DVM 0020, and ASTM G201.

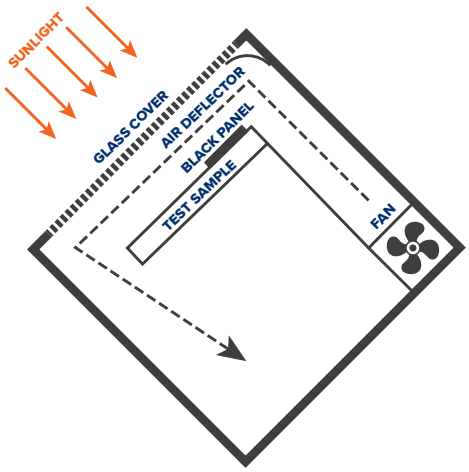
DEGRADATION MODES PRODUCED IN AIM BOX TESTING:

- Color change
- Cracking
- Peeling
- Oxidation
- Heat deflection
- Tackiness

REALISTIC SIMULATION

Testing automotive interiors can be different from testing other materials because air temperatures inside a vehicle can far exceed the temperature outside it. Materials can reach 100 °C or more in warmer climates. Furthermore, the light that reaches internal components is filtered by automotive glass, making it different from natural outdoor sunlight.

The AIM box uses tempered glass - clear or laminated - to simulate the sunlight spectrum experienced inside a car. In addition, a black panel thermometer continuously monitors the environment inside the box. A cooling fan and curtain are used to ensure that specimens are maintained at precise and realistic temperatures.





HIGH TEMPERATURE TESTING
Automotive instrument and dashboard panels are commonly tested in AIM boxes.

ACCELERATION

The AIM box in Arizona can perform precision azimuth tracking of the sun throughout the day. This boosts the total amount of solar radiation reaching the specimens for faster results without sacrificing accuracy.

TRUE AIM BOX

To increase the total amount of solar radiation exposure, Q-Lab's proprietary new TRUE (Tracking Reflecting Ultra Exposure) AIM box uses highly reflective mirrors and dual-axis tracking (azimuth and elevation) to focus more sunlight into the box interior. This technique approximately doubles the total sunlight received every day.



Standard Outdoor Exposures

True benchmarking via standardized testing. Natural outdoor testing according to international test standards gives improved consistency of results from test to test. Having a library of outdoor test data according to recognized test standards gives the best estimate for a product's service life and serves as an excellent basis for comparison to accelerated laboratory testing.

DIRECT EXPOSURE (ASTM G7, ASTM D1435)

Specimens can be securely mounted at a variety of angles for direct exposure to the sun. Various backing techniques are available to simulate the thermal environment of the specimen's intended service application. Plywood backing raises temperatures, while open- or mesh-backed specimens receive maximum natural air flow for cooler temperatures.



UNDER GLASS (ASTM G24, ISO 877-2)

These exposures are used to test interior-use materials, such as textiles and printing inks. Specimens are behind 3 mm window glass which will filter out short-wavelength (UVB) light. Exposures are typically at a 45° or 5° angle from horizontal.



BLACK BOX (ASTM D4141, GMW 14873)

These tests reproduce conditions found on the horizontal surfaces of a vehicle, including higher temperatures and longer wet times. Under glass black box exposures are used to test automotive interior materials or other applications that experience similar conditions.

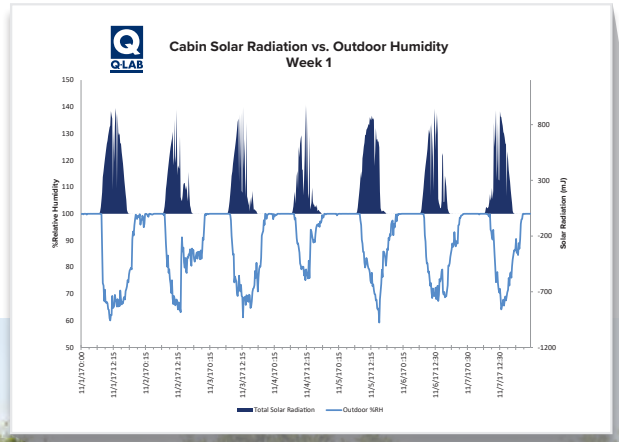


Other standard outdoor exposure test methods are available, including salt-accelerated, outdoor acid etch, and mildew-enhanced weathering.

Custom Tests & Special Projects

If you need a specialized test for a component, assembly, or complete product, Q-Lab can customize a test program to identify any problem areas quickly. Do you need to measure the temperature profile of multiple areas of your product throughout the day? Or design a test that accurately simulates your product's end use? Whatever your need, our experts can design a customized test solution to fit your budget.





Outdoor weathering testing in a replicated end use environment, like the shed shown above, can demonstrate interactions between components and give a more realistic representation of outdoor product durability.

DETAILED DATA ACQUISITION

Q-Lab can instrument your product to capture the data most important to you, and we always take care to protect confidentiality.

Evaluations & Physical Testing

Exposing your products or materials is only half of the equation. Measuring how they degrade over time is the other half. Q-Lab's engineers and technicians are worldwide experts at identifying and quantifying how your materials change when exposed to weathering or corrosion tests. We have many tools at our disposal to tell you nearly everything you need to know about your product's performance.

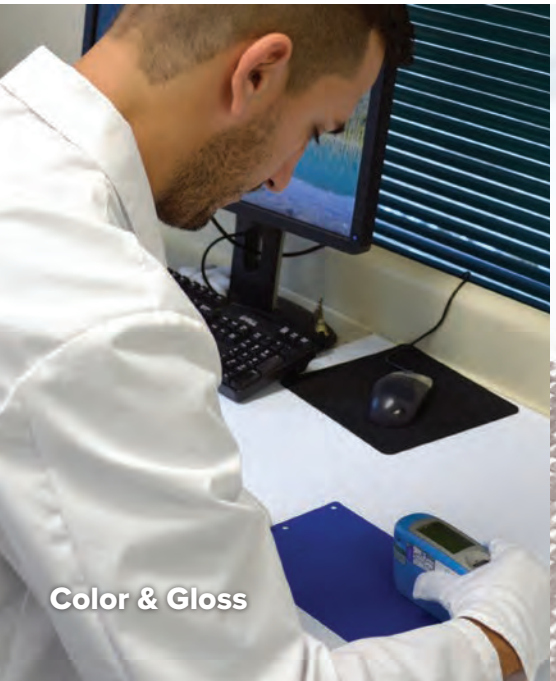
VISUAL EVALUATIONS

Visual evaluations detail all defects observed, such as cracking/checking, blistering, chalking, dirt retention, flaking, mildew growth, surface rust, or color change, according to standardized rating scales.

Q-Lab technicians are highly trained and experienced experts in the field of evaluation techniques and reporting scales. Many are actively involved in the organizations that create and maintain the standards relied upon by labs around the world.

COLOR & GLOSS MEASUREMENTS

Instrumental measurements of appearance and surface characteristics include gloss, distinctness of image, and color. These are used in place of or in addition to visual ratings, and are required by many standards. The science of color and appearance measurement can be very complex, and Q-Lab's experts can guide you through your options to ensure you get the correct data for your needs.


Color & Gloss


Mechanical


Photography



VISUAL EVALUATIONS

All visual ratings are made under standard lighting conditions to provide accurate, repeatable results.

MECHANICAL TESTS

Mechanical tests on physical properties are necessary for many products and materials. They include:

- Drop impact
- Pencil hardness
- Tape adhesion
- Mandrel bend & elongation
- Tensile strength & elongation
- Shear & peel adhesion
- Gravelometer stone chip impact
- Taber abrasion

PHOTOGRAPHY & SPECIAL HANDLING

A complete test program often includes other special services or handling. Common services include washing, polishing, scribing, and specimen weighing. Q-Lab can also photograph weathering and corrosion changes, which requires special lighting skills and equipment.



OUR GLOBAL NETWORK

We are committed to provide world-class technical, sales, and repair support in each of the over 60 countries in which we operate. Visit **Q-Lab.com/support** for contact information specific to your location and inquiry type.

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