

PLASTIC MATERIAL IN AUTO LENSES

There are two types of plastic used in lamps:

Polycarbonate (PC) and Polymethyl Methacrylate (PMMA)

Polycarbonate is softer and more flexible but sensitive to abrasion and UV. PC material when tested to SAE J576 has a haze value of 25% - 35% after the 3 year UV exposure test. If the PC is treated with an UV inhibitor the post-exposure haze can be reduced to ~6% depending on the manufacturer.

PMMA is more brittle and can crack more easily but is very resistant to UV. PMMA material when tested to SAE J576 has a haze value of ~5% after the 3 year UV exposure test.

HEADLAMPS

PC is used in headlamp lenses because it will not crack as easily as PMMA when hit by a stone while driving. It still remains sensitive to abrasion from sand and dust so it must be coated with a silicone hardcoat. FMVSS 108 requires that UV induced haze of headlamp material must be less than 30%, therefore it may be necessary to coat the headlamp lenses with an acceptable UV inhibitor, often the hardcoat will have an UV inhibitor capability.

SIGNALING AND MARKER LAMPS

PMMA and PC are both used in signaling and marker lamp lenses. If the lamp is on the front of the vehicle it is best to use PC for its crack resistance (no hardcoat is necessary). FMVSS 108 requires that UV induced haze of signaling and marker lamps must be less than 30%, therefore either PC or PMMA is acceptable. No UV inhibitor is needed.

REFLEX REFLECTORS

PMMA and PC are both used in reflex reflector lenses. FMVSS 108 requires that UV induced haze of reflex reflectors must be less than 7%, therefore PMMA is best to use. If PC is used it must be coated with a UV inhibitor. All PC lenses used for outer lenses that cover reflex reflectors must have a UV inhibitor.

ACCEPTABLE UV INHIBITORS

Morton International – LS123 Coating & LENS GARD II

Mitsubishi Rayon Co. – ACRYKING K101, F328 & PH503 Coatings

Idemitsu Petrochemicals – TARFLONCOAT 201

Note: 7% haze is just visible haze.

See the AMECA List of Acceptable Plastics available from www.ameca.org