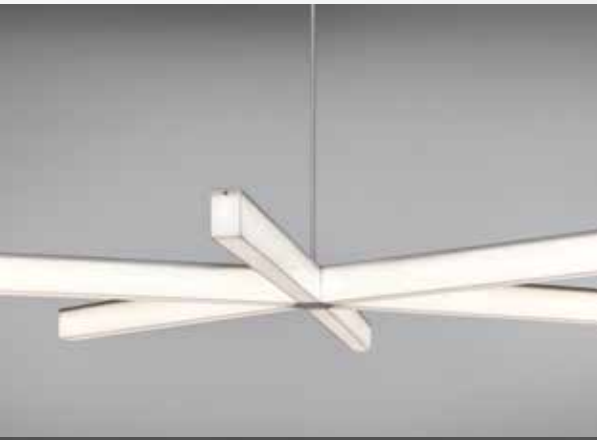




TRINSEO™

Fast Facts



Reflective Grades

Offer Designers Greater Freedom

Combining Reflective Surfaces and Key End Properties to Optimize Lighting

Manufacturers and designers know that to obtain the maximum benefit from LED Lighting technology, an important consideration is the surface area that covers or surrounds an LED light source, allowing light to be reflected and scattered. Depending on the material chosen, this surface -- or reflective area -- can and should result in optimal visible light being given off. Trinseo has responded to the industry's need for materials with a portfolio of polycarbonate-based injection molding and extrusion grade compounds. These materials deliver a highly reflective white surface while delivering the performance properties needed for LED lighting applications today.

Advantages and Benefits

High Reflectivity of 96% or higher

- Trinseo's portfolio features white, highly reflective resins that have been shown to retain their properties, including degree of reflectivity, over time. This offers manufacturers and designers the confidence in a quality product that maintains its integrity over the life of an application.

Design Freedom

- Trinseo resins offer designers multiple options to plan for reflective surfaces in their lighting applications in order to enhance appearance and function and to control cost. Available

in injection molding and extrusion grades and with ranges of flammability performance and thickness, our resins enable designers to create simplified objects, eliminating the need for internal reflectors.

Ignition Resistance

- Trinseo materials are available in a wide range of performance levels with UL 94 ratings at various thicknesses including V-2 @ .5mm, V-0 @ 0.8mm and 5VA @ 3.0mm. This offers designers the flexibility to design with the materials in various degrees of proximity to the light source.

Indoor/Outdoor Versatility

- Certain Trinseo resins are considered suitable for outdoor use with UL 746C f1 ratings and also, having been subjected to ultraviolet light (UV) exposure and/or water immersion. Such materials have been tested for flammability, mechanical impact and mechanical strength before and after exposure and have passed necessary criteria.

Cost Effectiveness

- Trinseo's reflective grade resins can replace films and coatings, internal reflectors and/or vapor deposited aluminum reflectors that once served to provide a light distribution function. This can offer a more economical approach to the manufacturer.

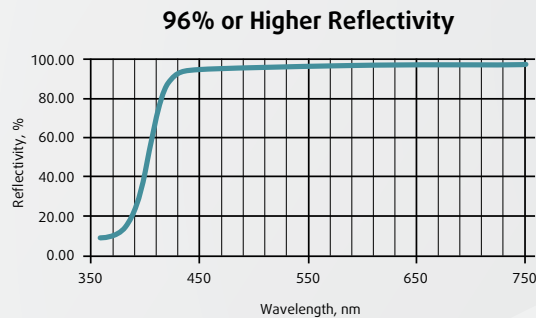
Table 1: Trinseo EMERGE™ Advanced Resins for Reflector Applications

Product	Reflectivity % at 550 nm ¹	UL 94 Flame Class	UL 746 f1 or f2	RTI	Melt Flow	Recommended Application
EMERGE™ PC 4350-7	96	V2 @ 0.5mm V2 @ 1.5mm	f1	80/80/80 @ 0.5mm 120/105/120 @ 1.5mm	7	Extruded Reflector Applications
EMERGE™ PC 4350-15	96	V2 @ 0.5mm V2 @ 1.5mm	f1	80/80/80 @ 0.5mm 120/105/120 @ 1.5mm	15	Injection Molded Reflector Applications
EMERGE™ PC 8130-10	96	V0 @ 0.8mm 5VB @ 2mm 5VA @ 3mm	f1	130-115-130	10	Reflectors, Reflector Covers
CALIBRE™ 301EP-37	-	V2 @ 1.5mm	-	125-115-125	37	Metalized Reflectors

Applications

- Luminaires
- Back reflectors, reflectors, reflector covers
- Automotive lighting
- Consumer indoor/outdoor lighting
- Commercial indoor/outdoor lighting
- Consumer electronics lighting

Figure 1: Reflectivity vs. Wavelength



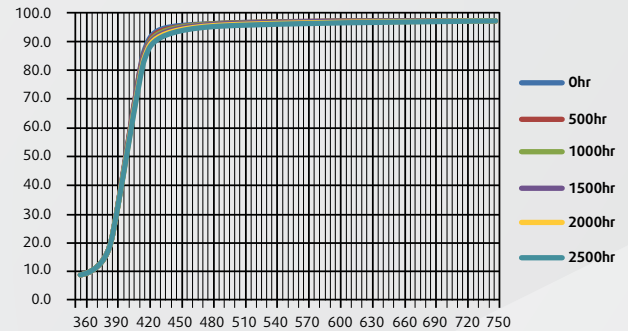
Importance of Reflectivity

When a material other than a metal plate is introduced in the path of visible light portions of that light will be lost through absorption or transmission. A white material has the highest degree of reflectivity (bounce back and scatter) but still light is lost. The percent of light reflectivity is critical because it indicates the amount of visible light that is preserved resulting in visible lumens and energy saving efficiency. All Trinseo reflective grades were and continue to be tested for reflectivity. Through rigorous development, Trinseo has developed a portfolio that has a reflectivity of 96% or greater depending on the wall thickness of the material and wavelength.

Processing Methods

- Extrusion
- Injection molding

Figure 2: Impact of Heat Over Time on Reflectivity (2500 Hours at 115°C)



Importance of Heat Aging

Plastic materials that are exposed to heat experience mechanical, physical and chemical changes. The extent of these changes is determined by exposure time and temperature. Due to the fact that reflective materials need to withstand the heat emitted from an LED source over an extended period of time, all Trinseo reflective grade plastics have been and will continue to be subjected to rigorous testing. Testing was done on all Trinseo grades at 2500 hours and 115°C and on average, as the chart above indicates, our materials maintain reflective properties while exhibiting no/limited signs of discoloration.

Focused on Meeting Your Needs

EMERGE™ Advanced Resins and CALIBRE™ Polycarbonate Resins from Trinseo can be specifically designed for reflective applications. Custom formulations or other specific properties are not a problem. Trinseo collaborates with customers in the Lighting industry to ensure that the materials selected meet the specific needs of each application including property performance, part design, manufacturing and regulatory requirements.

A commitment to the lighting industry. In addition to its reflective grades, Trinseo offers a full portfolio of CALIBRE™ Polycarbonate Resins and EMERGE™ Advanced Resins for use in all areas of the lighting industry including LED applications. For more information contact us at 1-855-TRINSEO (1-855-874-6736) or visit us online at <http://www.trinseo.com/industries/plastics/electrical-lighting>.



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Trinseo and its affiliated companies have a fundamental concern for all who make, distribute, and use their products and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products so that appropriate steps may be taken to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Trinseo products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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North America	+1-855-TRINSEO (855-874-6736)
Europe	+31-115-67-2601
South America	
Brazil	+0800-0474714
Argentina	+0800-2660569
Chile	+1230-020-1124
Colombia	+01800-5182475
Mexico	+01800-0834913
Asia Pacific	
China	+86-21-3851-1017
Email	CI@trinseo.com

www.trinseo.com

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