

AN ACRYLIC REFLECTING MATERIAL WHICH  
OFFERS NEW AND UNIQUE APPLICATIONS  
FOR TRAFFIC SIGNS

R. F. Hibbert, Vice-President,  
Reflexite Corporation, New Canaan, Connecticut

Molded acrylic lens sheet is a retro-reflecting product which has many effective applications for traffic signs and signals and for automotive signs and signals as used on cars, trucks and trailers.

This acrylic plastic, sometimes known as Methacrylate, has been in good service and continuous exposure for over ten years.

Acrylic lens reflector sheet is made up of minute spherical lens sections which are an integral part of it. The lenses are arranged in honeycomb patterns and are correctly spaced to provide 2900 accurately molded lens sections per square inch of surface. The smooth back surface of the reflecting sheet is in the focal plane of the front surface lenses and only the area of greatest retro-reflecting efficiency is used in each lens section.

A reflecting medium, usually aluminum flake in a vehicle of acrylic lacquer is applied to the back surface of the sheet. The reflecting system then consists of a multiplicity of minute spherical lenses on the front surface and a reflecting material on the back surface. The lenses, acting in unison, give the whole reflecting pattern an even, bright appearance, when illuminated and viewed from a normal distance.

If a highly concentrated beam of light is desired for long range, narrow divergence is achieved by precise molding to the focal length of the lens, a thickness of .070 in.; conversely, if wide divergence is desired, the plastic is molded off-focus to provide a reflector of lower intensity with a wider divergence angle at a nominal molding thickness of .055 in.

Preliminary research and experimentation proved that an integral lens sheet could be molded and a 1/2 in.

square die was eventually made up. Pieces were molded and a sign was fabricated which presented sufficient retro-reflecting efficiency to justify additional research and development.

Acrylic lens sheet offers a fully reflectorized letter stroke and reflected copy may be read at distances at which the eye will resolve copy of the same size in daylight. Halation does not present a problem and an adequate target is provided beyond reading distance.

Acrylic lens sheet also permits a combination of colors arranged in suitable designs or patterns in a single sheet by varying the color of the reflecting material placed on the back of the sheet. Silver reflected letters may be combined with low-reflecting background colors to provide a colorful sign by day and a high contrasting reflecting sign at night.

Additional effects can be had by the use of light-fast dyes backed by aluminum flake combined with dye lacquer, offering a sign of acrylic lens sheet which has daytime aspect at night in legibility, color and shape.

A light reflecting red with light-fast characteristics was developed through research efforts carried on in conjunction with the automobile industry. This light-fast red is obtained with acrylic plastic in combination with red dye lacquer by means of a high-vacuum metallizing technique. This technique is offered to the highway field for useful purposes such as a STOP sign with silver copy and red background, both reflecting.

For general sign production, the reflectorized plastic or acrylic sheet is mounted on metal, plywood, or other backing material with an adhesive. Exposure tests now in their fifth year indicate the efficiency of this method.

These tests also indicate that neither the adhesive, the plastic, nor the acrylic paint will support fungus or mildew growth. Low maintenance cost is assured through the use of acrylic lens sheet, thus justifying a somewhat higher initial material cost.

Individual letter panels available in various fonts and sizes, mounted in flanged aluminum holders offer a convenient method of construction. Such letters can be quickly salvaged for reuse when a sign is damaged or when the background requires refinishing.

Letters may be cut from aluminum-backed reflectorized sheets with a band or jig-saw and fastened to a mounting

board either mechanically or by means of an adhesive.

Acrylic lens sheet performs well under stormy weather conditions and snow does not tend to cling to the surface.

The lens pattern breaks up undesirable front surface glare and in locations subject to road film and industrial smoke, the lens may be cleaned with water and detergent. Acrylic lens sheets are durable and not easily damaged by vandals. Localized hair-cracking at the point of impact of sticks, stones etc. does not affect reflecting qualities provided that the cracking does not progress.