Preclear Reflective License Plate Sheeting
Series 4750
For Use on Multi-Year License Plates

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Description
3M™ Preclear Reflective License Plate Sheeting Series 4750 is a durable, all-weather, retroreflective sheeting consisting of lens elements enclosed within a transparent resin, designed for use in the fabrication of reflective license plates. Plates can be embossed and roll coated with either transparent or opaque roll coating inks to produce attractive license plates which function 24 hours a day to enhance nighttime safety and the legibility of the vehicle identification system. The sheeting appears similar during the day and at night (when viewed by reflected light) and is highly reflective when viewed at both head-on and wide entrance angles.

The backside of the reflective sheeting is pre-coated with a pressure sensitive adhesive, protected by a removable liner, for application to license plate substrates.

The versatility of 3M sheetings, processing materials and equipment allow the design of a license plate system specific to the desires and requirements of plate issue relative to color, reflectivity, durability, design and plate manufacture.

Performance Considerations
Series 4750 license plate sheetings are designed for multi-year applications. Experience indicates that finished plates, processed and applied as recommended, will perform without appreciable fading, cracking, blistering or peeling for a period up to five years.

Performance Characteristics

A. Reflectivity
The minimum reflectivity values of 3M sheeting series 4750 are shown in Table A.

Table A
Minimum Coefficient of Retroreflection
Candela per foot candle per Square Foot
Candela per Lux per Square Meter

| Sheeting Color | Entrance Angle1 | 4˚ | 40˚ |
|----------------|----------------|
| White 4750     | 70             | 16  |
| Yellow 4751    | 50             | 10  |
| Red 4752       | 12             | 3   |
| Gold 4753      | 45             | 10  |
| Orange 4754    | 25             | 10  |
| Lt. Blue 4756  | 30             | 7   |
| Lt. Green 4757 | 30             | 7   |
| Lemon Yellow 4761 | 45         | 10  |

1Observation (Divergence) Angle - The angle between the illumination axis and the observation axis
2Entrance (Incidence) Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

All measurements shall be conducted in accordance with ASTM E-810, “Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting”.

The reflectivity of the flat area of the same test plate, totally wet by rain, will not be less than 90% of the values specified in Table A. Wet performance measurements shall be conducted in accordance with ASTM E-810. Contact your 3M Technical Representative for wet performance measurement test set-up.
To measure the reflectivity values of applied 3M sheeting, prepare test plates as follows:

- Test plates of the same size and format as the actual issue must be produced of the same materials, on the same equipment, and by the same general processes of metal cleaning, laminating, embossing or debossing and roll coating as the production plates.
- The plates must be designed to have a minimum of 36 square inches (230 sq cm) of flat area in one section of the plate to facilitate photometric testing.
- All test plates should be conditioned for 24 hours at 72°F ± 5°F (22°C ± 1°C) and 50 ± 5% R.H. prior to testing.
- Each plate must be thoroughly hand washed (see Cleaning), prior to testing.

**B. Adhesive**

Test plates as prepared above will resist peeling, scuffing and marring from recommended application surfaces, during normal use handling and resist shocking off when jabbed with a spatula at -10°F (-23°C).

Prior to application, the protective paper liner can be removed from the adhesive by peeling without soaking in water or other solvents. The liner can be removed after accelerated storage for 4 hours at 150°F (65°C) under a weight of 2.5 pounds per square inch (0.18kg/cm²)

**Fabrication of Reflective License Plates**

**A. Substrates**

The pre-coated adhesive will form a permanent bond to the surface of clean, chemically treated or conversion coated aluminum substrates normally used in the manufacture of license plates and as recommended by 3M. Contact your 3M Technical Representative for specific substrate recommendations.

**B. Application**

3M sheeting is designed for application to clean flat coil or sheet stock by continuous squeeze roll application.

A minimum of 48 hours storage after application of sheeting is recommended before embossing or debossing. Laminated blanks must be stored on edge and used within one year after date of receipt of the 3M sheeting for best embossing results.

**C. Embossing and Debossing**

The reflective sheeting as applied to flat metal is sufficiently flexible to permit the embossing or debossing requirements of most conventional license plate designs.

3M sheeting may be embossed or debossed up to 2mm or 0.080 inches with standard embossing equipment and dies used for license plate production. Minimum embossing temperature is 70°F (21°C).

**D. Color Processing**

The legend is applied to embossed or debossed plates by roller coating with the following recommended high quality transparent or opaque inks.

*Note: Care should be taken in choosing color combinations to ensure attractiveness and maximum legibility. To assure suitable contrast for maximum legibility and safety, 3M recommends use of dark color roll coated characters on a white or yellow reflective sheeting background.*

**E. Oven Dried Inks**

3M series 4850 Opaque
3M series 4950 Transparent

*Note: Cool the license plates to room temperature before packaging.*

**F. Air Drying**

Contact your 3M Technical Representative for appropriate air dry inks.

**Cleaning**

For maximum service, do not use abrasive or chemically harsh cleaners. Use the same care as is used in cleaning the paint surface on the vehicle. The license plate surface should be cleaned of normal use dirt accumulation by washing with a mild detergent and water using a soft bristle brush or cloth. Following cleaning, the plate should be thoroughly rinsed with water. To remove tar, oil, or road film, cautious use of mild solvents such as mineral spirits, turpentine, kerosene, or other solvents, commonly used on vehicle finishes may be employed. Use of aromatic solvents or ketones or solvents containing them should be avoided.

**Storage**

Sheeting and roll coat inks must be stored in their original package in a cool, dry area and should be used within one year after date of receipt.

**General Characteristics and Packaging**

The reflective sheeting as supplied will be of good appearance, free from ragged edges and cracks and packaged according to commercial standards. The sheeting must be spliced for continuous roll application. Additional sheeting is supplied to compensate for splices.
Specifications
The information contained herein on 3M reflective sheeting Series 4750 is considered to describe typical minimum requirements for an effective reflective license plate material. As such, the information could be incorporated into a product purchase specification to be used in conjunction with a specification for finished retroreflective license plates.

Health and Safety Information
Read all health hazard, precautionary, and first aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

FOR INFORMATION OR ASSISTANCE
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