

Traffic Safety and Security Division

# Reflective Sheeting Procedures for Application to Reboundable Traffic Control Devices

Series CW80, 3300 or 3910

Information Folder 3.3

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## Description

3M™ Engineer Grade Reflective Sheeting Series CW80, 3M™ High Intensity Grade Reflective Sheeting Series 3300, or 3M™ Diamond Grade™ Reflective Sheeting Series 3910 are designed for application to polyethylene-based drums, channelizers, posts, tubes, and cones. Eligibility for 3M's warranty requires compliance with the following application procedure.

## Application Instructions

**Minimum Application Temperature:** The minimum temperature for applying 3M reflective sheeting to a polyethylene device is 60° F (16° C).

**Device and Sheeting Temperature:** The plastic device and reflective sheeting should be placed in the manufacturing environment and allowed to reach application room temperature at least four hours prior to application.

**Cleaning Substrate:** The device surface must be clean and free of dust, dirt or other foreign objects. Cleaning with isopropyl alcohol (IPA) or 70% rubbing alcohol is recommended.

**Flame Treating:** All polyethylene devices must have the entire surface where sheeting is to be applied uniformly flame treated.

Flame treating of plastics has been in use in manufacturing processes for many years to make plastic surfaces receptive to various types of adhesive. Flame treating changes the surface molecular structure of polyethylene and some other plastics by using an oxidizing flame to produce a polar surface state that allows for good adhesive bonding in preparation for labeling, printing, or decorating.

The plastic to be treated should be clean and free of dirt and oil prior to treatment. For most effective flame treating, the tip of the outer blue

envelope of flame should just touch the surface of the material being treated (i.e. the inner cones of flame that appear yellow or red contain products of incomplete combustion and do not treat as effectively as the blue outer tip).

Most processors use burners designed to provide a continuous "ribbon of flame," either straight or curved, depending upon the shape of the objects to be treated. This does not preclude the use of a series of small burners to accomplish the same result.

In order to obtain the correct "atmosphere" at the tip of the flame, there should be a slight excess of oxygen. This is accomplished by slightly exceeding the recommended air to gas ratio. In the case of natural gas, the usual recommended air-to-gas ratio is 10 air to 1 gas on a volumetric basis. By setting an air-to-gas ratio of 11-12 to 1, the treating flame is assured of a hot oxidizing tip. In the case of propane gas, the recommended ratio is 24 to 1; therefore, settings of 25-26 to 1 should be sufficient.

Time exposure to the treating flame may be very short. In many cases, exposures to the flame of one second are adequate if all other factors are correct.

Flame treating operations that overexpose the plastic may tend to deform or soften it which can induce problems (i.e. flame treating is NOT heat treating).

Automatic flame treating equipment supplied by Flynn Burner Corporation (914-636-1320 or flynnburner.com).

Allow the flame treated device to cool to room temperature for at least 15 minutes before applying reflective sheeting. Re-stacking devices prior to sheeting application is not recommended. Sheeting must be applied to the flame treated device on the same day.

**Squeegeeing:** All sheetings are supplied with a pressure sensitive adhesive (PSA). The PSA is activated by applying pressure to the sheeting surface. Immediately after applying sheeting a mandatory squeegee process must be completed using a 3M PA-1 squeegee with an SA-1 low friction sleeve or equivalent. 3M squeegees and sleeves can be obtained by calling your 3M Customer Service Representative. The sheeting must be squeegeed firmly with adequate pressure to remove entrapped air.

**Carpet Strip Pressure:** When applying sheeting to a polyethylene device using a 3M Cone Wrapping machine, the mandrel nip pressure against the table carpet strip must be calibrated per 3M's recommendation. Contact 3M Technical Service for carpet/table adjustments for correct nip pressure. Inadequate pressure will cause adhesion failures.

**Set Up Time:** The device with applied sheeting must be allowed to set at room temperature for at least four hours prior to shipping.

## 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. Electronically, visit us at [www.3M.com/us](http://www.3M.com/us) and select MSDS search.

**Shipping:** The plastic devices can be stacked to assure product reaches the end customer without blemishes. To protect the sheeting during shipping, shrink-wrap the top device.

**Quality Control:** A quality control program can greatly improve overall application quality. Control charting can be implemented with the assistance of 3M. Initial peel adhesion of properly applied reflective sheeting to a polyethylene device should have a minimum value of 3.5 pounds per lineal inch, after four hours, measured in accordance to ASTM D3330. For example, 4-inch sheeting would equal 14 pounds of peel adhesion when measured at 90° and at a rate of 1 foot per minute (spring scale provided by 3M). Quality control charting data **will be required** for warranty consideration for Series 3910.

**Application Certification:** All applicators of 3M sheeting to reboundable devices must be certified in order for the warranty to be valid. This can be arranged by calling 3M Traffic Safety and Security Division Technical Service at: 1-800-553-1380 extension 4.

**For information or assistance call:**

**1-877-777-3571**

**In Canada call:**

**1-800-265-1840**

**Internet:**

**[www.3M.com/roadwaysafety](http://www.3M.com/roadwaysafety)**

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