



Bid Number 50 - 116411

Two year contract for a supply of reflective sheeting for the Jefferson Parish Department of Engineering.

MAY 12, 2016 AT 2:00 PM

ATTENTION VENDORS!!!

Please review all pages and respond accordingly, complying with all provisions in the technical specifications and Jefferson Parish Instructions for Bidders and General Terms and Conditions. All bids must be received in the Purchasing Department by the bid due date and time.

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Jefferson Parish Department of Engineering
Traffic Engineering Division

Two-Year contract for a supply of Reflective Sheeting for the Jefferson Parish Department of Engineering, Traffic Engineering Division

Items included in this contract and technical specifications to follow:

1. Super-high efficiency, full cube prismatic reflective sheeting, series 4000
2. Enclosed lens reflective sheeting, series 3270 – engineer grade
3. Cement adhesive for traffic control
4. Electronic cuttable film, series 1170
5. Clear protective overlay film, series 1150
6. Clear premium protective overlay film, series 1160
7. Clear transfer tape, series tpm-5

Contract terms:

These specifications are prepared for a two (2) year contract for a supply of reflective sheeting for Jefferson Parish Traffic Engineering Division, East and West Banks, for marking and striping of Jefferson Parish roadways.

Warranty:

Products shall be warranted that they are manufactured in accordance with the applicable material specifications and are free from defects in workmanship and materials. Any defective items sold under this contract shall be replaced at no cost to the purchaser.

General specifications:

This specification designates the general requirements for a supply of reflective sheeting for Jefferson Parish Traffic Engineering Division East and West Banks for marking and striping of Jefferson Parish roadways. Jefferson Parish reserves the right to purchase any quantity of units more or less than specified and/or as needed during the two (2) year period of the contract.

Material deliveries for bidding purposes, bid prices shall reflect no minimum delivery quantity.

The bidder is not to pre-ship any quantity until authorized by purchase order.

The quantities shown on the proposal guide are approximate quantities to be acquired by Jefferson Parish over a two (2) year period. Actual usage will be on an "as needed" basis.

All pertinent technical specifications and literature must be included in the bid.

Successful bidder will be allowed 30 days, from the date of contract execution, to stock and maintain sufficient quantities of material on hand to meet the needs of Jefferson Parish. Vendor will ship requested quantities (as indicated on purchase order) within seven (7) calendar days.

Bid delivery shall include all freight and delivery costs to Jefferson Parish.

Samples may be required for comparable evaluation. Bidders must honor such requests and, if required, submit within five (5) working days. Failure to honor such request will result in the bid being considered non-responsive.

**JEFFERSON PARISH DEPARTMENT OF ENGINEERING
TRAFFIC ENGINEERING DIVISION
REFLECTIVE SHEETING SPECIFICATIONS**

Two-Year contract for a supply of Reflective Sheeting for the Jefferson Parish Department of Engineering, Traffic Engineering Division

SUPER-HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING (DIAMOND GRADE)

Note: The following Specification contains both warranty and pre-qualification clauses directly related to product performance.

Scope

This specification covers flexible, white or colored, Super-High Efficiency retro-reflective sheeting, tape and related processing materials designed to enhance the day/night visibility of traffic control signs and objects. (3M Series 4000, or approved equal).

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards.

ASTM D 4956-05 Standard Specification for Retro-reflective Sheeting for Traffic Control (Table 17 Color Requirements) and (Tables 10 and 14 for Luminance factors).

D 523 Standard Method for Test for Specular Gloss.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the Colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflection of retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

B209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

Description

The retroreflective sheeting shall have a smooth surface and shall be pre-coated with a pressure sensitive adhesive backing protected by a removable liner.

As per FHWA-SA-07-020, Jefferson Parish utilizes the "Comparison Panel" Assessment Method and Management Method "3" for assessment and management of sheeting retroreflectivity. These assessment methods compare the useful life of the sheeting to the warranty period for the sheeting. Unless otherwise specified herein, all applied and unapplied test samples and specimens shall be

conditioned at the standard conditions of 73 +/- 3 degrees F (23 +/- 3 degrees C) and 50 +/- 5% humidity for 24 hours prior to testing.

Control Sample Test Panels

Unless otherwise specified herein, when tests are to be performed using test panels, the specimens of retroreflective material shall be applied to smooth aluminum cut from ASTM B-209 Alloy 5052-H36, 5052-H38, 5154-H38 or 6061-T6 sheets in 0.020 inch (0.051 cm), 0.040 (0.102 cm) or 0.063 (0.160 cm) thickness. The aluminum shall be degreased and lightly acid etched before the specimens are applied. The specimens shall be applied to the panels in accordance with the recommendations of the retroreflective sheeting manufacturer.

Control Sample Test Panel Performance

In keeping with the afore mentioned assessment method, the manufacturer supplying materials specified herein must supply control samples of these materials in each color for installation on test panels located at the Jefferson Parish Sign and Signal Shop, 2100 Dickory Avenue. Harahan, LA. These materials must be mounted and exposed to continuous weather conditions for three years prior to bid opening. It is the responsibility of the manufacturer to insure that mounting has been accomplished. Successful performance of the product sample must be demonstrated continuously for a minimum of three years in this control sample or actual field performance in Jefferson Parish or other similar municipality in order for the product to be qualified as meeting these specifications. Jefferson Parish will compare the control sample to a new sample after the test period to ensure endurance of retroreflectivity requirements. In lieu of three year control sample exposure, materials (sheeting, process colors, overlay films) shall be approved for use, when, in the opinion of this agency, sufficient evidence and certification of use in other municipalities having similar environmental conditions from the manufacturer exists to ensure that the materials and services offered can reliably conform to this specification and warranty period.

Successful performance shall include, but not be limited to continuous adhesion and lamination, shrinkage or distortion, retained color, chromatic quality and reflectivity. Failure to comply with this section of these specifications shall require disqualification and rejection of the manufacturer's product for the bid.

TABLE I:

No single test sample as per ASTM E810 shall be less than 80% of the values indicated in Table I.

Coefficient of Retroreflection, RA

The coefficients of Retroreflection shall not be less than the minimum values specified in Table I.

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for corresponding color in Table I.

Units

Coefficients of retroreflection RA shall be specified in units of candelas per footcandle per square foot (candelas per lux per square meter).

The observation angles shall be 0.2, 0.5 and 1.0 degrees.

Values at 0 and 90 degrees orientation shall be averaged.

Minimum Coefficient of Retroreflection R_A
(Candelas per lux per square meter)

Table I
Minimum Coefficient of Retroreflection
(cd/lux/m²)

White	-4	30
0.2	570	215
0.5	400	150
1.0	120	45

Blue	-4	30
0.2	26	10
0.5	18	6.8
1.0	5.4	2.0

Yellow	-4	30
0.2	425	160
0.5	300	112
1.0	90	34

FYG	-4	30
0.2	455	170
0.5	320	120
1.0	96	36

Red	-4	30
0.2	114	43
0.5	80	30
1.0	24	9

FY	-4	30
0.2	340	130
0.5	240	90
1.0	72	27

Green	-4	30
0.2	57	21
0.5	40	15
1.0	12	4.5

FO	-4	30
0.2	200	75
0.5	140	52
1.0	42	16

Gloss Retention

The retroreflective sheeting shall have an 85 degree specular gloss of not less than 50 when tested in accordance with ASTM D-523.

Adhesive

The protective liner attached to the adhesive shall be easily removed by peeling without soaking in water or other solutions, without breaking, tearing, or removing any adhesive from the backing.

Impact Resistance

The retroreflective sheeting shall comply with the impact resistance requirements contained in ASTM D 4956-05, section 6.10.

Resistance to Accelerated Outdoor Weathering

The Retro-reflective surface of the sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after 3 years unprotected outdoor exposure. The coefficient of retroreflection shall not be less than 80% of the values in Table I and the colors shall conform to the requirements of ASTM D 4956, table 17.

The sheeting shall show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more than 1/32 inch (0.08 cm) shrinkage or expansion.

Resistance to Heat

The retroreflective sheeting shall retain coefficients of retroreflection between 85% and 115% of the values measured before exposure.

General Characteristics and Packaging

The retroreflective sheeting as supplied shall be of good appearance, free from ragged edges, cracks and extraneous materials, and shall be furnished in either rolls or sheets. When furnished in continuous rolls, the average number of splices shall not be more than 3 per 50 yards (45.7 m) of material with a maximum of 4 pieces in any 50 yard (45.7 m) length. Splices shall be butted or overlapped and shall be suitable for continuous application as furnished. When furnished as cut sheets or sign faces, the sheeting shall be packaged flat in accordance with commercially accepted standards. The sheeting shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Each carton shall clearly stipulate the brand, quantity, size, lot or run number and color. Stored under normal conditions the retroreflective sheeting as furnished shall be suitable for use for a minimum period of one (1) year. Rolls and sheets are determined by requisition.

Performance Requirements and Obligations.

Certification

The sheeting manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed herein.

Warranty for Ordinary Colors:

Sheeting manufactured of standard colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations, shall perform effectively for a period of ten (10) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to

natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

The sheeting must retain 80% of values listed in Table I up to 7 years and 70% of values listed in Table I up to 12 years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of entire sign and shall be replaced under manufacturer's replacement obligations.

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for the corresponding integral color.

All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Warranty for Fluorescent Colors:

Sheeting manufactured of fluorescent colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations shall perform effectively for a period of ten (10) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

The sheeting shall retain 80% of values listed in Table I up to 5 years and 70% of values listed in Table I up to 7 years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of entire sign and shall be replaced under manufacturer's replacement obligations.

All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Warranty for Fluorescent Orange Colors

Sheeting manufactured of fluorescent orange and applied to sign blank material in accordance with the sheeting manufacturer's recommendations, is expected to perform effectively for a minimum of three (3) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose or (2) retains less than 50% of the coefficient of retroreflection values listed in Table I at 0.2 degrees observation, -4 degrees entrance (measured in accordance with ASTM E810).

All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.

Natural causes include effects of exposure to weather. Natural causes exclude (without limitation) damage from exposure to chemicals, abrasion and other mechanical damage (such as from fasteners used to mount the sign, collisions or mishandling), vandalism, or malicious mischief.

Sheeting Manufacturer's Replacement Obligation

For standard colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory during:

For the entire ten (10) years, the sheeting manufacturer will replace the sheeting required to restore the sign surface to its original effectiveness.

In addition, during the first seven (7) years the sheeting manufacturer will cover the cost of restoration of the sign surface to its original effectiveness at no cost to agency for materials and labor. Replacement sheeting shall carry the unexpired warranty of the sheeting it replaces.

For fluorescent colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory:

If the failure occurs within the first five (5) years from the date of fabrication, the manufacturer will, at its expense, restore the sign surface to its original effectiveness.

If the failure occurs within the sixth (6th) or seventh (7th) year from the date of fabrication, the manufacturer will furnish the necessary amount of sheeting necessary to restore the sign surface to its original effectiveness.

Replacement sheeting shall carry the unexpired warranty of the sheeting it replaces.

For temporary signing, (fluorescent orange), where it can be shown that the retroreflective sheeting fails to conform to the performance requirements, the sheeting manufacturer's sole responsibility and purchaser's and user's exclusive remedy shall be:

Provide Replacement Sheeting

This sheeting shall carry the unexpired warranty of the sheeting it replaces.

Process Inks

The manufacturer of the sheeting shall manufacture and may offer at no additional cost the process inks, clears and thinners recommended for the sheeting to meet the performance requirements of this specification, and shall further be responsible for technical assistance in the use of these inks in accordance with Section 8.

Slip Sheet

Slip Sheet paper, if recommended by the sheeting manufacturer for sheeting surface protection or for use in packing, storage or shipping finished signs, may furnish in rolls by the manufacturer, at no additional charge, in at least equal square footage and in the same widths as the sheeting supplied.

Washers

Washers, if recommended by the sheeting manufacturer to protect the sign surface from damage by bolts or other fasteners, may be furnished by the manufacturer at no additional charge or a nominal charge.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the sheeting shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not be limited to, training videos, material application, equipment operation, silk screening techniques, packaging, storage and other proven sign shop practices as they apply to the reflective sheeting supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.

Compliance

Failure to comply with the requirements of these specifications shall be cause for cancellation of annual contract if applicable. ***Jefferson Parish requires sign dating of all signs at the time of application. That date constitutes the start of field performance obligation period.***

Patented Devices, Materials and Processes

Seller will pay any damages, costs or fines resulting from any claims against Jefferson Parish for infringement or alleged infringement of third party patents by product supplied by Seller under this specification. The costs paid by Seller shall include legal and court costs deemed reasonably necessary by counsel for Jefferson Parish in defending against such claims.

ENCLOSED LENS REFLECTIVE SHEETING

Note: The following Specification contains both warranty and pre-qualification clauses directly related to product performance.

DESCRIPTION

The reflective sheeting shall consist of spherical lens elements embedded within a transparent plastic having a smooth, flat outer surface. The sheeting shall be weather resistant and have a protected pre-coated adhesive backing. (3M Series 3200, or approved equal)

REQUIREMENTS

Photometric

Background- The reflective sheeting shall have the following coefficients of retroreflection expressed as the average of representative readings over the entire surface of a panel. Measurements shall be conducted in accordance with ASTM E810 "Standard Test Method for coefficient of Retroreflection of Retroreflective Sheeting."

TABLE I – R _A (Candlepower/Footcandle/Square Foot)						
	White		Yellow		Red	
Div. Ang.	.2 deg.	.5 deg.	.2 deg.	.5 deg.	.2 deg.	.5 deg.
Inc. Ang.						
-4 deg.	70.0	30	50	25	14.5	7.5
30 deg.	30	15	22	13	6	3
	Blue			Green		
Div. Ang.	.2 deg.	.5 deg.		.2 deg.	.5 deg.	
Inc. Ang.						
-4 deg.	4.0	2		9	4.5	
30 deg.	1.7	0.8		3.5	2.2	
	Orange			Brown		
Div. Ang.	.2 deg.	.5 deg.		.2 deg.	.5 deg.	
Inc. Ang.						
-4 deg.	25.0	13.5		2	1	
30 deg.	7	4		1	0.5	

Applied or Demountable Copy

Reflective Sheeting for all sign copy including letters, numerals, symbols, borders, and route markers shall be White which has been carefully selected by the manufacturer for uniformity of day and night appearance. No further matching shall be necessary.

Rainfall Performance

The brightness of the reflective sheeting, totally wet by rain, shall not be less than 90% of the above values. Wet performance measurements shall be conducted in conformance with Standard RAINFALL TEST specified in Federal Specification L-S-300C "Sheeting and Tape, Reflective, Non-exposed Lens Adhesive Backing."

Color

Color shall be as specified and shall conform to ASTM D 4956-05, Table 5. Luminance factors shall conform to ASTM D 4956-05, Table 6.

Adhesive

The reflective sheeting shall include a pre-coated pressure adhesive which may be applied without necessity of additional adhesive coats on the reflective sheeting or application surface.

The protective liner attached to the adhesive shall be easily removed by peeling without soaking in water or other solvents.

The adhesive coated sheeting, when applied at 72 deg. F (22 deg. C) and conditioned for 24 hours at this temperature, shall form a durable bond to clean, smooth, corrosion and weather resistant substrates when exposed to temperatures of -30 deg. to 160 deg. F. (-35 deg. to 72 deg. C).

Film

The reflective sheeting shall have sufficient strength and flexibility so that it can be handled, processed, and applied according to the recommendations of the sheeting manufacturer without appreciable stretching, tearing, or other damage. It shall permit application over and conformance to moderate, shallow embossing characteristics of certain sign borders and symbols. Following liner removal, the reflective sheeting shall not shrink more than 1/32" (0.79 mm) in 10 minutes nor more than 1/8" (3.18 mm) in 24 hours in any dimension per 9.0" (22.9 cm) square at 72 deg. F. (22 deg. C) and 50% RH.

The sheeting with the liner removed and conditioned for 24 hours at 72 deg. F (22 deg. C) and 50% RH, shall be sufficiently flexible to show no cracking when slowly bent, in one second's time.

Surface

The sheeting surface shall be smooth and flat, and facilitate cleaning and wet performance. The sheeting surface shall be readily processed and compatible with recommended transparent and opaque process colors and show no loss of the color coat with normal handling, cutting, and application.

The sheeting shall permit cutting and color processing at temperatures of 60-100 deg. F. (15 deg. - 28 deg. C) and relative humidity's of 20-80%. The sheeting shall be heat-resistant and permit force curing without staining of unapplied sheeting at temperatures up to 150 deg. F (65 deg. C) and up to 200 deg. F (93 deg. C) on applied sheeting.

Effective Performance Life and Warranty

Reflective sheeting processed, applied to approved sign base materials, and cleaned, in accordance with manufacturer's recommendations for their use on traffic control signs, shall be considered as performing effectively for a field life of seven (7) years if the sheeting has not deteriorated due to natural causes to the extent that: 1) the sign is ineffective for its intended purpose when viewed from a vehicle, or 2) the average night time reflective brightness is less than that specified in Table II below. The vendor shall be replace all reflective sheeting failing to give satisfactory performance for the seven (7) year field service.

TABLE II - EFFECTIVE PERFORMANCE LIFE
 Average Specific Intensity per Square Foot
 (Candlepower/FootCandle/Square Foot divergence) and -4 deg. incidence*

Sheeting Type & Color	7 yrs. Field Service	Performance Life**
White	35	7 Years
Yellow	20	7 Years
Red	5	7 Years
Blue	2	7 Years
Green	3	7 Years
Orange	10	7 Years

*Candlepower measurement shall be made, following sign cleaning, in accordance with procedure recommended in Section IIA.

**Performance years for each color shall be stated by the bidder.

The reflective material exposed in the Jefferson Parish control sample for 36 months (2100 Dickory Avenue, Harahan, LA), shall not support fungus growth and accumulate dirt to the extent that the reflective brightness before cleaning is less than 75% of the reflective brightness after cleaning.

The sheeting surface may be readily refurbished by cleaning and clear overcoating in accordance with the manufacturer's recommendations.

General Characteristics and Packaging

The reflective sheeting as supplied shall be of good appearance, free from ragged edges, cracks, and extraneous materials, and shall be furnished in both rolls and sheets. When the reflective sheeting is furnished in continuous rolls, the average number of splices shall not be more than three per 50 yards of material with a maximum of four splices in any 50-yard length. Splices shall be butted or overlapped and shall be suitable for continuous application as supplied.

Sheeting shall be packaged in accordance with commercially accepted standards.

Stored under normal conditions, the reflective sheeting as supplied shall be suitable for use for a period of at least one year.

NOTE: Metric equivalents in parenthesis.

Equipment, Delivery, Service

The manufacturer supplying the retroreflective sheeting shall provide service for recommended sheeting application equipment and certify that trained personnel will be available within 24 hours notice to render such service.

The manufacturer must supply materials in all widths and colors specified. No partial bids will be accepted.

Control Sample Test Panel Performance

In keeping with the assessment method stated on page 1 of these specifications, the manufacturer supplying materials specified herein must supply control samples of these materials in each color for installation on test panels located at the Jefferson Parish Sign and Signal Shop, 2100 Dickory Avenue. Harahan, LA. These materials must be mounted and exposed to continuous weather conditions for three years prior to bid opening. It is the responsibility of the manufacturer to insure that mounting has been accomplished. Successful performance of the product sample must be demonstrated continuously for a minimum of three years in this control sample or actual field performance in Jefferson Parish or other similar municipality in order for the product to be qualified as meeting these specifications. Jefferson Parish will compare the control sample to a new sample after the test period to ensure endurance of retroreflectivity requirements. In lieu of three year control sample exposure, materials (sheeting, process colors, overlay films) shall be approved for use, when, in the opinion of this agency, sufficient evidence and certification of use in other municipalities having similar environmental conditions from the manufacturer exists to ensure that the materials and services offered can reliably conform to this specification and warranty period.

Successful performance shall also include, but not be limited to continuous adhesion and lamination, shrinkage or distortion, retained color, chromatic quality and reflectivity. Failure to comply with this section of these specifications shall require dis-qualification and rejection of the manufacturer's product for the bid.

ELECTRONICALLY CUTTABLE COLOR FILMS FOR USE ON RETROREFLECTIVE SHEETING

Note: The following specification contains warranty clauses directly related to product performance.

Scope

This document covers flexible, transparent, durable films designed to be applied to retroreflective materials for the creation of traffic control signs and devices. (3M Series 1170, or approved equal).

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards

B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

D 523 Standard Method for Test for Specular Gloss.

D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflective of Retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

Description

Electronic cuttable films shall consist of durable, transparent, colored films coated with a transparent pressure sensitive adhesive protected by a removable liner. The films are designed to be cut on knife over roll (sprocket fed or friction fed) and flatbed electronic cutting machines. The films shall be available in standard traffic colors, be dimensionally stable, and be designed to optimally cut, weed, lift, and transfer. Use of electronic cuttable films will not require Jefferson Parish Traffic Engineering Sign Shop to release any volatile organic compounds.

Coefficient of Retroreflection, Ra.

When electronic cuttable film is applied to retroreflective sheeting, the composite will conform to the percentage retained of the minimum coefficient of retroreflection specified by Jefferson Parish Traffic Engineering and the manufacturer for the retroreflective sheeting when the retroreflective sheeting is screen processed. The coefficient of retroreflection shall be determined in accordance with ASTM E 810.

Units

Coefficients of retroreflection Ra shall be specified in units of candelas per foot candle per square foot (candelas per lux per square meter).

Retroreflective sheeting with datum marks shall be tested in the orientation specified by the manufacturer. If no datum mark is supplied, the sheeting shall be rotated to determine the minimum Ra which shall be reported without averaging.

Specular Gloss

The electronic cuttable film shall have an 85 degrees specular gloss of not less than 50 when tested in accordance with ASTM D 523.

Processing and Cuttability

The electronic cuttable film shall permit cutting, weeding, masking with transfer tape, lifting, and application to retroreflective sheeting when used in accordance with manufacturer's recommendations at temperatures between 65 degrees and 95 degrees F (18.3 degrees and 35.0 degrees C) and relative humidity between 30% and 70%. The film shall lay flat with minimal edge curl and be dimensionally stable.

Adhesive Liner

The protective liner attached to the adhesive shall be easily removable by peeling without soaking in water or other solutions, without breaking, tearing, or removing any adhesive from the electronic cuttable film. The liner shall have a controlled release from the adhesive coated film sufficient to allow cutting without the film popping off from the liner while still allowing the liner to easily be peeled from the film.

Resistance to Accelerated Outdoor Weathering

When electronic cuttable film is applied to retroreflective sheeting, the surface of the film shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after two (2) years unprotected outdoor exposure. The coefficient of retroreflection shall not be less than the value specified in Table I for the High Intensity Prismatic Reflective Sheeting (page 8 of these specifications) when the retroreflective sheeting is screen processed.

The film shall show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more that 1/32 inch (0.08cm) shrinkage or expansion.

The film shall show acceptable colorfastness.

Retained reflectivity shall be the same as Jefferson Parish's specification for screen processed retroreflective sheeting of the type being tested.

The electronic cuttable film shall not be removable from the retroreflective sheeting without damage.

Where more than one panel of a color is measured, the coefficient of retroreflection shall be the average of all determinations.

Colorfastness

After the specified outdoor weathering, the sheeting shall conform to the color requirements in ASTM D 4956-05 Tables 5 and 6.

General Characteristics and Packaging

Roll Goods

When supplied as roll goods, the electronic cuttable film shall be of good appearance, free from ragged edges, cracks and extraneous materials. The maximum number of splices in each roll shall be three per 50 yards of material. Splices shall be butted. The sheeting shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Each carton shall clearly stipulate the brand, quantity, size, lot or run number, and color. Stored under normal conditions the electronic cuttable film as furnished shall be suitable for use for minimum period of one (1) year.

Performance Requirements and obligations

Certification

The film manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed above.

Field Performance Requirements

The electronic cuttable film applied to retroreflective sheeting, both materials applied in accordance with the manufacturer's recommendations, shall as a composite perform with the same effective performance life as Jefferson Parish requires for that type of retroreflective sheeting as noted within these specifications when screen processed. The composite sign will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:

- (1) The sign is ineffective for its intended purpose when viewed from a vehicle under normal day and night driving conditions; or
- (2) The coefficient of retroreflection is less than the minimums specified within these specifications for the retroreflective sheeting when screen processed.

Electronic Film Manufacturer's Replacement Obligation

Where it can be shown that retroreflective traffic signs with electronic cuttable film supplied and used according to the film manufacturer's recommendations have not met the performance requirements of these specifications, the film manufacturer shall cover restoration costs as provided in these specifications for the retroreflective sheeting when screen processed.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the electronic cuttable film shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not limited to, training videos, material applications, equipment operation, packaging, storage and other proven sign shop practices as they apply to the electronic cuttable film supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.

CLEAR PROTECTIVE OVERLAY FILM

Note: The following specification contains warranty clauses directly related to product performance.

Scope

This section covers Protective Overlay Film (3M Series 1150, or approved equal) designed as a protective transparent overlay for application to reflective sheeting.

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards

B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

D 523 Standard Method for Test for Specular Gloss.

D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflective of Retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

Description

The protective overlay film shall be clear, colorless film. The film shall resist staining by spray paint, permanent markers, etc. Defacement due to vandalism shall be easily removed by selected solvent wiping.

Adhesive

The overlay film shall have a pressure sensitive, transparent adhesive.

Application

The overlay film shall be applied to smooth, clean reflective sign surfaces when air and surface temperatures are above 60° (16° C). New signs must be clean and the process colors completely dry and hard prior to application of overlay film. The overlay film shall be applied using either Mechanical Squeeze roll applicator, Hand Squeeze roll applicator, or Hand application.

Packaging and Storage

When supplied as roll goods, the overlay film shall be of good appearance, free from ragged edges, cracks and extraneous materials. The film shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Stored under normal conditions, the overlay film as furnished shall be suitable for use for minimum period of one (1) year.

Performance Requirements and obligations

Certification

The film manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed above.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the protective overlay film shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not limited to, training videos, material applications, equipment operation, packaging, storage and other proven sign shop practices as they apply to protective film supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.



JEFFERSON PARISH

Department of Purchasing

Michael S. Yenni
Parish President

Brenda J. Campos
Director

May 4, 2016

ADDENDUM # 1

Bid No.: 50-00116411

Bid Opening Date: 05/12/2016
Extended Date:

For: Two year contract for reflective sheeting for Dept. of Engineering.

Answering questions:

1. For the sheeting, in general, will the width be 48" wide? Yes, 48" wide.
2. Item #3
3M Series 444/446 Orange/White Striped Sheeting. Should the quantity of 500 sq ft be linear feet? What sheeting width is needed, 6", 8", or 12"? Yes the rolls should be linear ft. 8" width.
3. Item #4
3M 3910 White and 3M 3914 Orange. Should the quantity of 750 sq ft be linear feet? Not available in 8" – comes in "20 Inch, 36 Inch, 4 Inch, 48 Inch, 6 Inch" widths Change to 4" and 6"? Yes the sheeting is linear ft. The width should be 6.

Replace page six (6) and seven (7) with revised Addendum # 1 sheets.

Sincerely,

Donna Reamey

Donna Reamey, Buyer II
Jefferson Parish Purchasing Department

Bidders must acknowledge all addenda on the bid form. Bidder acknowledges receipt of this addendum on the bid form as indicated. Failure to do so will result in bid rejection.

This addendum is a part of the contract documents and modifies the original bidding documents and specifications. The contents of this addendum shall be included in the contract documents. Changes made by this addendum shall take precedence over the documents of earlier date.

CLEAR PREMIUM PROTECTIVE OVERLAY

Note: The following specification contains warranty clauses directly related to product performance.

Scope

This section covers Clear Premium Protective Overlay Film (3M Series 1160, or approved equal) designed as a high performance protective transparent overlay for use over traffic signs with High Intensity Prismatic Sheeting.

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards

B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

D 523 Standard Method for Test for Specular Gloss.

D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflective of Retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

Description

The premium protective overlay film shall be clear, colorless film. The film shall resist staining by spray paint, permanent markers, eggs, stickers, etc. Defacement due to vandalism shall be easily removed by selected solvent wiping and shall have the ability to substantially restore performance and appearance of the overlaid sign after cleaning.

Adhesive

The overlay film shall have a pressure sensitive, transparent adhesive.

Application

The overlay film shall be applied to smooth, clean reflective sign surfaces when air and surface temperatures are above 60° (16° C). New signs must be clean and the process colors completely dry and hard prior to application of overlay film. The overlay film shall be applied using either Mechanical Squeeze roll applicator, Hand Squeeze roll applicator, or Hand application.

Packaging and Storage

When supplied as roll goods, the overlay film shall be of good appearance, free from ragged edges, cracks and extraneous materials. The film shall be packed snugly in corrugated fiberboard cartons, in

accordance with commercially accepted standards. Stored under normal conditions, the overlay film as furnished shall be suitable for use for minimum period of one (1) year.

Performance Requirements and obligations

Certification

The film manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed above.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the protective overlay film shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not limited to, training videos, material applications, equipment operation, packaging, storage and other proven sign shop practices as they apply to protective film supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.

CLEAR TRANSFER TAPE

Note: The following specification contains warranty clauses directly related to product performance.

Scope

This section covers Clear Transfer Tape, (3M TPM-5 or approved equal) designed to apply pre-spaced legends onto High Intensity Prismatic Sheeting.

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards

B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

D 523 Standard Method for Test for Specular Gloss.

D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflective of Retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

Description

The Transfer Tape shall be clear, colorless film. The Transfer Tape shall resist stretching, wrinkling and air entrapment during hand application. The tape shall have adequate stiffness for handling of marking (4 sq. ft. or larger), intricate sign markings and for applications performed at high temperatures.

Adhesive

The overlay film shall have a pressure sensitive, transparent adhesive.

Application

The overlay film shall be applied to smooth, clean reflective sign surfaces when air and surface temperatures are above 60° (16° C). The Transfer Tape shall be applied using hand squeegee application.

Packaging and Storage

When supplied as roll goods, the overlay film shall be of good appearance, free from ragged edges, cracks and extraneous materials. The film shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Stored under normal conditions, the overlay film as furnished shall be suitable for use for minimum period of one (1) year.

Performance Requirements and obligations

Certification

The film manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed above.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the protective overlay film shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not limited to, training videos, material applications, equipment operation, packaging, storage and other proven sign shop practices as they apply to protective film supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.

DATE: 4/26/2016

INVITATION TO BID
THIS IS NOT AN ORDER

BID NO.: 50-00116411

JEFFERSON PARISH
PURCHASING DEPARTMENT
P.O. BOX 9
GRETNA, LA. 70054-0009
504-364-2678

Page: 1

BUYER: DREAMEY@jeffparish.net

BIDS WILL BE RECEIVED IN THE PURCHASING DEPARTMENT, SUITE 4400, JEFFERSON PARISH GENERAL GOVERNMENT BUILDING, 200 DERBIGNY STREET, GRETNA, LA 70053 UNTIL 2:00 PM, 5/12/2016 AND PUBLICLY OPENED THEREAFTER.

LATE BIDS WILL NOT BE ACCEPTED

Unless submitting via online (see Page 3), each bid must be submitted in a sealed envelope bearing on the outside; the name of the Bidder, his address, and the name of the project for which the bid is submitted and the bid number.

NOTE: ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOSTATIC FIGURES OR SIGNATURES SHALL RESULT IN BID REJECTION.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS
THE FOLLOWING INSTRUCTIONS APPLY TO ALL BIDS

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647.

All vendors submitting bids must register as a Jefferson Parish vendor if not already yet registered. Bidders may be required to furnish current W-9 Forms and respective Tax Identification Numbers within 10 days after bid opening if such information is not on file or not up to date. Registration forms may be downloaded from www.purchasing.jeffparish.net and clicking on Vendor Information.

All quotations shall be based on F.O.B. Agency warehouse or job site, anywhere within the Parish as designated by the Purchasing Department. This provision does not apply to public works projects

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alterations from the specifications must be indicated and/or supporting documentation supplied with bid submission.

Bidders should submit all questions in writing and fax them to the Purchasing Department at (504) 364-2693 no later than FIVE (5) working days prior to bid opening. Bid numbers should be mentioned in all requests. Questions may also be emailed to the buyer for this bid at the email address listed above. If submitting online, vendors may send questions via the E-Procurement site no later than Five (5) working days prior to the bid opening.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum. Please note that all official communication will be expressed in the form of an addendum.

All formal Addenda require written acknowledgement on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected. JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications.

Visit our website at [HTTP://PURCHASING.JEFFPARISH.NET](http://PURCHASING.JEFFPARISH.NET)

JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. Vendors must not alter the bid forms. Doing so will cause the bid to be rejected.

If the bid exceeds \$30,000.00 and the company is duly authorized to do business in the state of Louisiana, a corporate resolution must be submitted with the bid or the person signing the bid documents must be listed on the Louisiana Secretary of State's website as an officer of the corporation, unless bidder has otherwise complied with LSA-R.S. 38:2212(B)(5). If the bid is in excess of \$30,000 and bidder is registered out of the state of Louisiana, a corporate resolution must be submitted with the bid, unless bidder has otherwise complied with LSA-R.S. 38:2212(B)(5). Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. Bids submitted by Owner or Sole Proprietorships must include certification that he or she owns the entity for which the bid is signed. Sole proprietors submitting bids for public works projects shall within 10 days after bid opening submit sole proprietorship certification.

NOTE: A sample corporate resolution can be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document. A sample certification of sole proprietorship can also be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

A. AWARD OF CONTRACT: JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE. IN THE EVENT OF SPLIT AWARD, THE PURCHASING DEPARTMENT MAY CONTACT VENDORS TO REQUEST REQUIRED AFFIDAVITS. THOSE VENDORS WILL HAVE 10 DAYS FROM THE DATE OF NOTICE TO SUBMIT COMPLETE, SIGNED AND NOTARIZED AFFIDAVITS IN ORIGINAL FORMATS.

All bid prices shall remain valid for 45 days. Jefferson Parish and the lowest responsive and responsible bidder(s) by mutual written consent may mutually agree to extend the deadline for award by one (1) or more extensions of thirty (30) calendar days.

Preference is hereby given to materials, supplies, and provisions produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside the state. "LSA-R.S.38:2251-2261"

B. USE OF BRAND NAMES AND STOCK NUMBERS: Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

C. CANCELLATION OF CONTRACT: JEFFERSON PARISH reserves the right to cancel all or any part if not shipped promptly. No charges will be allowed for parking or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel any contract at anytime and for any reason by issuing a THIRTY (30) day written notice to the contractor.

For good cause and as consideration for executing a contract with Jefferson Parish, vendor conveys, sells, assigns and transfers to Jefferson Parish or its assigns all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Louisiana, relating to the particular good or services purchased or acquired by Jefferson Parish.

D. PRICES: Jefferson Parish is exempt from paying sales tax under LSA-R.S. 47:301 (8)(c). All prices for purchases by Jefferson Parish of supplies and materials shall be quoted in the unit of measure specified and unless otherwise specified, shall be exclusive of state and Parish taxes. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit price shall prevail.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A17.1-1961).

Advertised bids will be tabulated and a copy of the tabulation will be forwarded to each responding bidder.

IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS

This Electronic Procurement System allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only. Please note requirements contained in this bid package for electronic bid submission.

Please visit the Purchasing Department webpage at <http://purchasing.jeffparish.net> to register and review Jefferson Parish solicitations.

The general specifications for construction projects and the purchase of materials, services and/or supplies are those adopted by the JEFFERSON PARISH Council by Resolution No. 113646 or 113647 dated 12/09/09. The general conditions adopted by this resolution shall be considered as much a part of this document as if they were written wholly herein. A copy may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at <http://purchasing.jeffparish.net> and clicking on Online Forms.

ADDITIONAL REQUIREMENTS FOR THIS BID

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

10,12,13,15

1. All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(I), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.
2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.
3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.
4. A LA State Contractor's License will be required in accordance with LSA R.S. 37-2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.
5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.
7. PUBLIC WORKS BIDS: All awards for public works in excess of \$5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.
8. NON-PUBLIC WORKS BIDS: A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.
9. NON-PUBLIC WORKS BIDS: A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.
10. Unless otherwise stated in the bid specifications, the successful bidder will be required to procure standard insurance policies evidencing Parish-mandated insurance requirements as indicted on the attached sheet. The current certificate of insurance must be submitted by low bidder within 10 days after bid opening to the Purchasing Department. Failure to comply will cause bid to be rejected. JEFFERSON PARISH reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies) If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.
12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations on warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.
13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.
14. PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required; Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit and E-Verify Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department on all solicitations for construction, alteration or demolition of public building or project, including but not limited to requirements found in LSA-RS 38:2212.9; LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1. Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.
15. NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required; Non-Collusion Affidavit, and Campaign Contribution Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department. See LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1 Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.

It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission: and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.

All Public Work Projects are required to use the Louisiana Uniform Public Work Bid Form

All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES _____ NO X

MAXIMUM ESCALATION PERCENTAGE REQUESTED _____%

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF _____.

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed, for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

DELIVERY: FOB JEFFERSON PARISH

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES

10-20 DAYS ARO

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable)

NOT APPLICABLE

THIS SECTION MUST BE COMPLETED BY BIDDER:

FIRM NAME: 3M Company

ADDRESS: 3M Center Bldg 225-4N-14

CITY, STATE: St. Paul, MN. ZIP: 55144-1000

TELEPHONE: (651) 737-8274 FAX: (888) 246-9793

EMAIL ADDRESS: tbidgroup@mmm.com

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

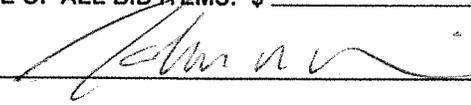
Acknowledge Receipt of Addenda: NUMBER: #1 May 4th, 2016

NUMBER: _____

NUMBER: _____

NUMBER: _____

TOTAL PRICE OF ALL BID ITEMS: \$ _____

AUTHORIZED SIGNATURE: 

John N. Morris

Printed Name

TITLE: Contract Administrator

SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.

NOTE: All bids should be returned with the BID NUMBER and BID OPENING DATE indicated on the outside of the envelope submitted to the Purchasing Department.

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00116411

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	200.00	SQFT	<p>TWO YEAR CONTRACT FOR A SUPPLY OF REFLECTIVE SHEETING FOR THE JEFFERSON PARISH DEPARTMENT OF ENGINEERING:</p> <p>0010 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING.</p> <p>SERIES 4000, DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES: WHITE 4090 RED 4092 GREEN 4097 BLUE 4095 YELLOW 4091</p> <p>3M SERIES 4090 3M Series 4090</p>	2.15	430.00
2	30,000.00	SQFT	<p>0020 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING,</p> <p>SERIES 4000, DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES FLOURESCENT: FLOURESCENT YELLOW - FY 4081 FLOURESCENT YELLOW GREEN - FYG 4083 FLOURESCENT ORANGE - FO 4084 FLOURESCENT ORANGE - FO 3924S</p> <p>3M SERIES 4080 3M Series 4080 & 3924S</p>	2.15	64,500.00
3	500.00	LF	<p>0030 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING,</p> <p>SERIES 4000. DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES: ALTERNATING ORANGE AND WHITE PRE-STRIPED BARRICADE SHEETING WITH 4 INCH LEFT OR RIGHT STRIPES 444 OR 6 INCH LEFT OR RIGHT STRIPES 446</p> <p>3M SERIES 444/446</p> <p>8" SHEETING WIDTH 3M Series 444/446 8" x 50yd Roll</p>	2.10	1,050.00
4	750.00	LF	<p>0040 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC FLEXIBLE REFLECTIVE SHEETING,</p> <p>SERIES 4000, DIAMOND GRADE - DG3 SERIES 3910 AND 3914 OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE FOR</p>	1.75	1,312.50
REVISED AS PER ADDENDUM # 1					

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00116411

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
9	10,000.00	SQFT	<p>GRAFITTI FROM SIGN SURFACES</p> <p>3M SERIES 1160</p>	0.25	2,500.00
			<p>0090 CLEAR TRANSFER TAPE, SERIES TPM-5 OR APPROVED EQUAL FOR USE WITH ELECTROCUT FILM SERIES 1170</p> <p>THE ABOVE TRANSFER TAPE IS USED FOR PURPOSES OF PRESPACING AND TRANSFERRING ELECTRONIC CUTTABLE FILM</p> <p>3M TPM-5 3M# TPM-5 Series</p>		

CORPORATE RESOLUTION

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF

INCORPORATED.

AT THE MEETING OF DIRECTORS OF _____
INCORPORATED, DULY NOTICED AND HELD ON _____,
A QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT
WAS:

RESOLVED THAT _____, BE AND IS HEREBY
APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-
FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON
BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS
AND TRANSACTIONS WITH THE PARISH OF JEFFERSON OR ANY OF ITS AGENCIES,
DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE
EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES,
CONTRACTS AND ACTS AND TO RECEIVE ALL PURCHASE ORDERS AND NOTICES
ISSUED PURSUANT TO THE PROVISIONS OF ANY SUCH BID OR CONTRACT, THIS
CORPORATION HEREBY RATIFYING, APPROVING, CONFIRMING, AND ACCEPTING
EACH AND EVERY SUCH ACT PERFORMED BY SAID AGENT AND ATTORNEY-IN-
FACT.

I HEREBY CERTIFY THE FOREGOING TO BE
A TRUE AND CORRECT COPY OF AN
EXCERPT OF THE MINUTES OF THE ABOVE
DATED MEETING OF THE BOARD OF
DIRECTORS OF SAID CORPORATION, AND
THE SAME HAS NOT BEEN REVOKED OR
RESCINDED.

SECRETARY-TREASURER

DATE

Non-Public Works Bid Affidavit Instructions

- **Affidavit is supplied as a courtesy to Affiants, but it is the responsibility of the affiant to insure the affidavit they submit to Jefferson Parish complies, in both form and content, with federal, state and parish laws.**
- **Affidavit must be signed by an authorized representative of the entity or the affidavit will not be accepted.**
- **Affidavit must be notarized or the affidavit will not be accepted.**
- **Notary must sign name, print name, and include bar/notary number, or the affidavit will not be accepted.**
- **Affiant MUST select either A or B when required or the affidavit will not be accepted.**
- **Affiants who select choice A must include an attachment or the affidavit will not be accepted.**
- **If both choice A and B are selected, the affidavit will not be accepted.**
- **Affidavit marked N/A will not be accepted.**
- **It is the responsibility of the Affiant to submit a new affidavit if any additional campaign contributions are made after the affidavit is executed but prior to the time the council acts on the matter.**

Instruction sheet may be omitted when submitting the affidavit

Non-Public Works Bid

AFFIDAVIT

STATE OF Minnesota

PARISH/COUNTY OF Ramsey

BEFORE ME, the undersigned authority, personally came and appeared: _____

John N. Morris, (Affiant) who after being by me duly sworn, deposed and said that he/she is the fully authorized Contract Administrator of 3M Company (Entity), the party who submitted a bid in response to Bid Number 50-00116411, to the Parish of Jefferson.

Affiant further said:

Campaign Contribution Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A _____ Attached hereto is a list of all campaign contributions, including the date and amount of each contribution, made to current or former elected officials of the Parish of Jefferson by Entity, Affiant, and/or officers, directors and owners, including employees, owning 25% or more of the Entity during the two-year period immediately preceding the date of this affidavit or the current term of the elected official, whichever is greater. Further, Entity, Affiant, and/or Entity Owners have not made any contributions to or in support of current or former members of the Jefferson Parish Council or the Jefferson Parish President through or in the name of another person or legal entity, either directly or indirectly.

Choice B X there are **NO** campaign contributions made which would require disclosure under Choice A of this section.

Debt Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A _____ Attached hereto is a list of all debts owed by the affiant to any elected or appointed official of the Parish of Jefferson, and any and all debts owed by any elected or appointed official of the Parish to the Affiant.

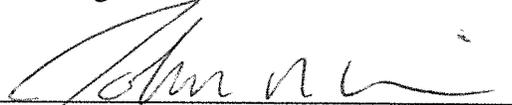
Choice B X There are **NO** debts which would require disclosure under Choice A of this section.

Affiant further said:

That Affiant has employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for Affiant; and

[The remainder of this page is intentionally left blank.]

That no part of the contract price received by Affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for Affiant.



Signature of Affiant

John N. Morris Contract Administrator
Printed Name of Affiant

SWORN AND SUBSCRIBED TO BEFORE ME
ON THE 10th DAY OF May, 2016.



Notary Public

Leslie O'Hara
Printed Name of Notary

20290569
Notary/Bar Roll Number

My commission expires Jan. 31, 2021



INSURANCE REQUIREMENTS - BIDS

All insurance requirements shall conform to Jefferson Parish Resolution No. 113646 or No. 113647. The contractor shall not commence work under this contract until he has obtained all insurance and complied with the requirements of the specifications and said Parish Resolutions. Except as otherwise provided by law, the Parish Attorney's Office with the concurrence of the Director of Risk Management is authorized to omit in whole or part the insurance requirements of this section in connection with contracts. Vendors inquiring about this shall submit his written request to the Purchasing Department prior to the due date of the bid. Contractor must deliver and maintain such insurances as provided; failure to do so shall be grounds for suspension, discontinuation or termination of the contract.

Successful bidder will be required to procure standard insurance policies evidencing Parish mandated insurance requirements indicated below. The current certificate of insurance must be submitted by low bidder within 10 days after bid opening to the Purchasing Department. Failure to comply will cause bid to be rejected.

1. WORKER'S COMPENSATION INSURANCE

As required by Louisiana State Statute, exception; Employer's Liability, Section B shall be \$1,000,000 per occurrence when Work is to be over water and involves maritime exposures to cover all employees not covered under the State Worker's Compensation Act, otherwise this limit shall be no less than \$500,000 per occurrence.

2. COMMERCIAL GENERAL LIABILITY

Shall provide limits not less than the following: \$1,000,000.00 Combined Single Limit per Occurrence for bodily injury and property damage.

3. COMPREHENSIVE AUTOMOBILE LIABILITY

Bodily injury liability \$1,000,000.00 each person; \$1,000,000.00 each occurrence.
Property Damage Liability \$1,000,000.00 each occurrence.

DEDUCTIBLES

No insurance required shall include a deductible not greater than \$10,000.00. The cost of the deductible shall be borne by the contractor.

NOTE: If the vendor requires a change in deductibles, the request must be submitted in writing to the Purchasing Department prior to the due date of the bid. Such request shall be reviewed by the Parish Attorney's Office.

UMBRELLA LIABILITY COVERAGE

An umbrella policy or excess may be used to meet minimum requirements.

CONSTRUCTION AND RENOVATION PROJECTS:

Unless otherwise specified in the bid, these additional insurance is required. Such insurance is due upon contract execution.

OWNER'S PROTECTIVE LIABILITY

To be for the same limits of liability for bodily injury and property damage liability established for commercial general liability.

BUILDER'S RISK INSURANCE

The contractor shall maintain Builder's Risk Insurance at his own expense to insure both the owner (Parish of Jefferson) and contractor as their interest may appear.

NOTE for CERTIFICATE HOLDER:

All insurance certificates shall list the certificate holder as follows:

"The Parish of Jefferson, its Districts, Departments and Agencies under the direction of the Parish President and the Parish Council." Additionally, the address on the Certificates should reflect the department which is letting the bid and reference the respective bid number.

Revised 2.10.2014



Jefferson Parish – Department of Purchasing
Bid No: 50-00116411
Two Year Contract for Reflective Sheeting for Dept. of Engineering
Bid Clarifications and Qualifications

Corporate Resolution -Page 25

As permitted under LSA-R.S/ 38:2212(B)(5)(b), attached please find 3M's Power of Attorney wherein 3M Company authorizes Mr. Morris to sign this bid document and accompanying affidavits.

Affidavit -Campaign Contributions

3M Company is a global, publicly traded Fortune 500 Company with annual sales in 2015 of approximately \$30B and over 89,000 employees worldwide. Because of 3M's size and the fact that it is publicly traded, 3M provides this certification for 3M Company only and for the past three years. Additionally, with a market cap of \$103B, no individual shareholder has a significant financial interest in 3M Company nor does any individual or entity have a financial interest in 3M Company that exceeds 25%.

Insurance Requirements

Deductibles

The scope of this procurement is the provision of reflective sign sheeting and no 3M employees will be on site. 3M's insurance program has deductibles well in excess of \$10,000. However, 3M's base coverage offered for this procurement far exceeds the coverage limitations as required by the contract. Additionally, when combined with 3M's financial resources, 3M is able to provide the requisite insurance coverage as desired by the Parish.

Owner's Protective Liability

The scope of this procurement is the provision of reflective sign sheeting and contains no construction or on-site presence. Accordingly, 3M will not provide Owner's Protective Liability coverage.

Note for Certificate Holder

3M will agree to add Jefferson Parish with whom it has privity, and its officers and employees as an additional insured.

Power Of Attorney

By the authority granted the undersigned by the Deputy General Counsel and Secretary, the individuals listed below are appointed as 3M's, or its designated subsidiaries', true and lawful attorneys-in-fact for it, and in its name, for commercially-available products and services and government-unique products and services (**except research and development services**) for which 3M or its designated subsidiaries will be a prime contractor or subcontractor to any federal, state or municipal governmental agency in the United States, or to a federal, state or municipal prime contractor or higher tier subcontractor in the United States, to do acts specified on behalf of this Corporation.

(a) To submit or execute proposals, bids, binding purchase orders, contracts and subcontracts, and documents related thereto, (**excluding certifications, representations and warranties to comply with certain laws or regulations²**), the following attorneys-in-fact

Authority for the below individuals applies to the specific Business Unit or staff function indicated, subject to the limitations imposed by their respective General Manager/Vice President or equivalent.

- **3M Purification**
Towne, Richard B.
- **3M Unitek Corporation**
Barnard, Mathew C.
- **Abrasive Systems Division**
Canniff, Perry M.
- **Advanced Materials Division**
Atwell, Mary
Davis, Scott J.
Giancola, John B.
Hanson, Scott R.
Ingstad, Cheryl A.
Lockhart, Bruce R.
Magrini, Dave L.
Moeller, Kent
Pearson, Claudia
Race, Robert J.
Rushin, Sandra J.
Utley, Elizabeth R.
- **Aero Technologies LLC**
Canniff, Perry M.
- **Aerospace and Aircraft Maintenance Division**
Canniff, Perry M.
- **Critical and Chronic Care Solutions Division**
McDonald, Michael S.
- **Electronics Markets Materials Division**
Anderson, Kevin G.
Koch, Joseph F.
- **Electrical Markets Division**
Schiller, Fred K.
- **Food Safety Department**
Erdman, Michelle M.
Wadie, John A.
- **Government R&D Contracts Department¹**
Charles, Ruth P.
Kays, Steven L.
Smith, Vivien L.
- **GTA-NHT, Inc**
Canniff, Perry M.
- **Stationery and Office Supplies Division**
Rihm, Diana L.
- **Health Information Systems Division**
Black, Lisa M.
Cline, Jan C.
Garrison, Garri L.
Graves, Terri M.
Jennings, Gerald R.
Kim, Myung H.
Mason, Deborah A.
Mathison, John C.
McDonough, James R.
Mitchell, Brian D.
- **Industrial Adhesive and Tapes Division / Venture Tape Corporation**
Authority for the below individual(s) applies to Federal Supply Schedule contracts only:
Canniff, Perry M.
- **Infection Prevention Division**
McDonald, Michael S.
-Health Care Service Support
Haataja, Brian J.
- **Oral Care Division**
Barnard, Mathew C.
- **Optical Systems Division**
Summers, Micki A.
- **Personal Safety Division 3M Detection Solutions**
Canniff, Perry M.
Wesemann, Melissa J.
- **Traffic Safety and Security Division**
Benz, John P.
Christopherson, Nicole A.
Flatley, Doreen A.
Kester, Joseph H.
Leibel, Matthew R.
McMahon, Denise C.
Moran, Daniel F.
Morris, John N.
Pointon, David A.
Roese, Arnie K.
Schiralli, Ella M.
Selby, Megan A.

Authority for the below individuals applies to the specific Business Unit or staff function indicated.

- **Global Channel Services**
Hilfer, Derrick E.
Mathers, Stephanie M.
- **Government Markets**
Augustine, Rick
Kindem, Karen A.
Patrick, Laurie A.
- **Office of General Counsel**
Kuyath, Richard N.
- **Government Contract Compliance**
Bordas, Richard J.
Carr, Terrance H.
Horwitz, Charles M.
Paraschou, Maria V.
Robinette, Thomas M.

¹ Authority is delegated by 3M's Senior Vice President, Research and Development, and Chief Technology Officer, to GR&DC to execute proposals and contracts for government research and development services.

² Product or performance warranties are to be reviewed and accepted by any 3M individual granted authority or responsibility to do so by the applicable business unit or staff group.

(b) To make certifications, (except Country of Origin certifications), the following attorneys-in-fact are hereby appointed. Authority may not be sub-delegated, except certifications made by other attorneys-in-fact listed in paragraph (a) may be authorized in writing by one of the individuals listed in paragraph (b) after a determination by one of the individuals in paragraph (b) that such certification is valid. Unfamiliar certifications must be cleared with the Government Contract Compliance department prior to execution.

Authority for the below individuals applies to any Business Unit or staff function indicated.

- **3M Unitek Corporation**
Barnard, Mathew C.
- **Aerospace and Aircraft Maintenance Division**
Canniff, Perry M.
- **Critical and Chronic Care Solutions Division**
McDonald, Michael S.
- **Electronics Markets Materials Division**
Anderson, Kevin G.
Koch, Joseph F.
- **Food Safety Department**
Erdman, Michelle M.
Wadie, John A.
- **GTA-NHT, Inc.**
Canniff, Perry M.
- **Government R&D Contracts Department**
Charles, Ruth P.
Kays, Steven L.
Smith, Vivien L.
- **Health Information Systems Division**
Black, Lisa M.
Cline, Jan C.
Garrison, Garri L.
Graves, Terri M.
Jennings, Gerald R.
Kim, Myung H.
Mason, Deborah A.
Mathison, John C.
McDonough, James R.
- **Infection Prevention Division**
McDonald, Michael S.
-Health Care Service Support
Haataja, Brian J.
- **Industrial Adhesive and Tapes Division / Venture Tape Corporation**
Authority for the below individual(s) applies to Federal Supply Schedule contracts only:
Canniff, Perry M.
- **Oral Care Division**
Barnard, Mathew C.
- **Personal Safety Division 3M Detection Solutions**
Canniff, Perry M.
Wesemann, Melissa J.
- **Traffic Safety and Security Division**
Benz, John P.
Leibel, Matthew R.
McMahon, Denise C.
Moran, Daniel F.
Morris, John N.
Roese, Arnie K.
- **Aero Technologies LLC**
Canniff, Perry M.

Authority for the below individuals applies to the specific Business Unit or staff function.

- **Global Channel Services**
Hilfer, Derrick E.
- **Government Markets**
Augustine, Rick
Kindem, Karen A.
Patrick, Laurie A.
- **Office of General Counsel**
Kuyath, Richard N.
- **Government Contract Compliance**
Bordas, Richard J.
Carr, Terrance H.
Horwitz, Charles M.
Paraschou, Maria V.
Robinette, Thomas M.

(c) To make Country of Origin certifications, the following attorney(s)-in-fact are hereby appointed:

- **Trade Compliance Department**
Authority may be sub-delegated in writing:
LaMere, Pierre J.

For all appointments, authority ceases or may be subsequently modified upon the individual's change in business unit, staff group or responsibilities, or when employment is terminated. Authority may be withdrawn or modified at any time.

This Power of Attorney revokes all prior Powers of Attorney with respect to the same matters and shall remain in effect until terminated by the undersigned or any other person authorized to grant powers of attorney on behalf of 3M. The undersigned has signed this Power of Attorney on this

28 day of March, 2016.

3M Company

By 
Charles M. Horwitz
Director, Government Contract Compliance

Company ID Number: 82942

THE E-VERIFY PROGRAM FOR EMPLOYMENT VERIFICATION

MEMORANDUM OF UNDERSTANDING

ARTICLE I

PURPOSE AND AUTHORITY

This Memorandum of Understanding (MOU) sets forth the points of agreement between the Social Security Administration (SSA), the Department of Homeland Security (DHS) and **3M Company** (Employer) regarding the Employer's participation in the Employment Eligibility Verification Program (E-Verify). E-Verify is a program in which the employment eligibility of all newly hired employees will be confirmed after the Employment Eligibility Verification Form (Form I-9) has been completed.

Authority for the E-Verify program is found in Title IV, Subtitle A, of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), Pub. L. 104-208, 110 Stat. 3009, as amended (8 U.S.C. § 1324a note).

ARTICLE II

FUNCTIONS TO BE PERFORMED

A. RESPONSIBILITIES OF THE SSA

1. Upon completion of the Form I-9 by the employee and the Employer, and provided the Employer complies with the requirements of this MOU, SSA agrees to provide the Employer with available information that allows the Employer to confirm the accuracy of Social Security Numbers provided by all newly hired employees and the employment authorization of U.S. citizens.
2. The SSA agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. The SSA agrees to provide the Employer with names, titles, addresses, and telephone numbers of SSA representatives to be contacted during the E-Verify process.
3. The SSA agrees to safeguard the information provided by the Employer through the E-Verify program procedures, and to limit access to such information, as is appropriate by law, to individuals responsible for the verification of Social Security Numbers and for evaluation of the E-Verify program or such other persons or entities who may be authorized by the SSA as governed by the Privacy Act (5 U.S.C. § 552a), the Social Security Act (42 U.S.C. 1306(a)), and SSA regulations (20 CFR Part 401).
4. SSA agrees to establish a means of automated verification that is designed (in conjunction with DHS's automated system if necessary) to provide confirmation or tentative nonconfirmation of U.S. citizens' employment eligibility and accuracy of SSA records for both citizens and aliens within 3 Federal Government work days of the initial inquiry.

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5. SSA agrees to establish a means of secondary verification (including updating SSA records as may be necessary) for employees who contest SSA tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of U.S. citizens' employment eligibility and accuracy of SSA records for both citizens and aliens within 10 Federal Government work days of the date of referral to SSA, unless SSA determines that more than 10 days may be necessary. In such cases, SSA will provide additional verification instructions.

B. RESPONSIBILITIES OF THE DEPARTMENT OF HOMELAND SECURITY

1. Upon completion of the Form I-9 by the employee and the Employer and after SSA verifies the accuracy of SSA records for aliens through E-Verify, DHS agrees to provide the Employer access to selected data from DHS's database to enable the Employer to conduct:

- Automated verification checks on newly hired alien employees by electronic means, and
- Photo verification checks (when available) on newly hired alien employees.

2. DHS agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. DHS agrees to provide the Employer names, titles, addresses, and telephone numbers of DHS representatives to be contacted during the E-Verify process.

3. DHS agrees to provide to the Employer a manual (the E-Verify Manual) containing instructions on E-Verify policies, procedures and requirements for both SSA and DHS, including restrictions on the use of E-Verify.. DHS agrees to provide training materials on E-Verify.

4. DHS agrees to provide to the Employer a notice, which indicates the Employer's participation in the E-Verify program. DHS also agrees to provide to the Employer anti-discrimination notices issued by the Office of Special Counsel for Immigration-Related Unfair Employment Practices (OSC), Civil Rights Division, and U.S. Department of Justice.

5. DHS agrees to issue the Employer a user identification number and password that permits the Employer to verify information provided by alien employees with DHS's database.

6. DHS agrees to safeguard the information provided to DHS by the Employer, and to limit access to such information to individuals responsible for the verification of alien employment eligibility and for evaluation of the E-Verify program, or to such other persons or entities as may be authorized by applicable law. Information will be used only to verify the accuracy of Social Security Numbers and employment eligibility, to enforce the Immigration and Nationality Act and federal criminal laws, and to ensure accurate wage reports to the SSA.

7. DHS agrees to establish a means of automated verification that is designed (in conjunction with SSA verification procedures) to provide confirmation or tentative nonconfirmation of employees' employment eligibility within 3 Federal Government work days of the initial inquiry.

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8. DHS agrees to establish a means of secondary verification (including updating DHS records as may be necessary) for employees who contest DHS tentative nonconfirmations and photo non-match tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of the employees' employment eligibility within 10 Federal Government work days of the date of referral to DHS, unless DHS determines that more than 10 days may be necessary. In such cases, DHS will provide additional verification instructions.

C. RESPONSIBILITIES OF THE EMPLOYER

1. The Employer agrees to display the notices supplied by DHS in a prominent place that is clearly visible to prospective employees.

2. The Employer agrees to provide to the SSA and DHS the names, titles, addresses, and telephone numbers of the Employer representatives to be contacted regarding E-Verify.

3. The Employer agrees to become familiar with and comply with the E-Verify Manual.

4. The Employer agrees that any Employer Representative who will perform employment verification queries will complete the E-Verify Tutorial before that individual initiates any queries.

A. The employer agrees that all employer representatives will take the refresher tutorials initiated by the E-Verify program as a condition of continued use of E-Verify.

B. Failure to complete a refresher tutorial will prevent the employer from continued use of the program.

5. The Employer agrees to comply with established Form I-9 procedures, with two exceptions:

- If an employee presents a "List B" identity document, the Employer agrees to only accept "List B" documents that contain a photo. (List B documents identified in 8 C.F.R. § 274a.2 (b) (1) (B)) can be presented during the Form I-9 process to establish identity).
- If an employee presents a DHS Form I-551 (Permanent Resident Card) or Form I-766 (Employment Authorization Document) to complete the Form I-9, the Employer agrees to make a photocopy of the document and to retain the photocopy with the employee's Form I-9. The employer will use the photocopy to verify the photo and to assist the Department with its review of photo non-matches that are contested by employees. Note that employees retain the right to present any List A, or List B and List C, documentation to complete the Form I-9. DHS may in the future designate other documents that activate the photo screening tool.

6. The Employer understands that participation in E-Verify does not exempt the Employer from the responsibility to complete, retain, and make available for inspection Forms I-9 that relate to its employees, or from other requirements of applicable regulations or laws, except for the following modified requirements applicable by reason of the Employer's participation in E-Verify: (1) identity documents must have photos, as described in paragraph 5 above; (2) a

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rebuttable presumption is established that the Employer has not violated section 274A(a)(1)(A) of the Immigration and Nationality Act (INA) with respect to the hiring of any individual if it obtains confirmation of the identity and employment eligibility of the individual in compliance with the terms and conditions of E-Verify ; (3) the Employer must notify DHS if it continues to employ any employee after receiving a final nonconfirmation, and is subject to a civil money penalty between \$500 and \$1,000 for each failure to notify DHS of continued employment following a final nonconfirmation; (4) the Employer is subject to a rebuttable presumption that it has knowingly employed an unauthorized alien in violation of section 274A(a)(1)(A) if the Employer continues to employ any employee after receiving a final nonconfirmation; and (5) no person or entity participating in E-Verify is civilly or criminally liable under any law for any action taken in good faith on information provided through the confirmation system. DHS reserves the right to conduct Form I-9 compliance inspections during the course of E-Verify, as well as to conduct any other enforcement activity authorized by law.

7. The Employer agrees to initiate E-Verify verification procedures within 3 Employer business days after each employee has been hired (but after both sections 1 and 2 of the Form I-9 have been completed), and to complete as many (but only as many) steps of the E-Verify process as are necessary according to the E-Verify Manual. The Employer is prohibited from initiating verification procedures before the employee has been hired and the Form I-9 completed. If the automated system to be queried is temporarily unavailable, the 3-day time period is extended until it is again operational in order to accommodate the Employer's attempting, in good faith, to make inquiries during the period of unavailability. In all cases, the Employer must use the SSA verification procedures first, and use DHS verification procedures and photo screening tool only after the the SSA verification response has been given.

8. The Employer agrees not to use E-Verify procedures for pre-employment screening of job applicants, support for any unlawful employment practice, or any other use not authorized by this MOU. The Employer must use E-Verify for all new employees and will not verify only certain employees selectively. The Employer agrees not to use E-Verify procedures for re-verification, or for employees hired before the date this MOU is in effect. The Employer understands that if the Employer uses E-Verify procedures for any purpose other than as authorized by this MOU, the Employer may be subject to appropriate legal action and the immediate termination of its access to SSA and DHS information pursuant to this MOU.

9. The Employer agrees to follow appropriate procedures (see Article III.B. below) regarding tentative nonconfirmations, including notifying employees of the finding, providing written referral instructions to employees, allowing employees to contest the finding, and not taking adverse action against employees if they choose to contest the finding. Further, when employees contest a tentative nonconfirmation based upon a photo non-match, the Employer is required to take affirmative steps (see Article III.B. below) to contact DHS with information necessary to resolve the challenge.

10. The Employer agrees not to take any adverse action against an employee based upon the employee's employment eligibility status while SSA or DHS is processing the verification request unless the Employer obtains knowledge (as defined in 8 C.F.R. § 274a.1 (1)) that the employee is not work authorized. The Employer understands that an initial inability of the SSA or DHS automated verification to verify work authorization, a tentative nonconfirmation, or the finding of

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a photo non-match, does not mean, and should not be interpreted as, an indication that the employee is not work authorized. In any of the cases listed above, the employee must be provided the opportunity to contest the finding, and if he or she does so, may not be terminated or suffer any adverse employment consequences until and unless secondary verification by SSA or DHS has been completed and a final nonconfirmation has been issued. If the employee does not choose to contest a tentative nonconfirmation or a photo non-match, then the Employer can find the employee is not work authorized and take the appropriate action.

11. The Employer agrees to comply with section 274B of the INA by not discriminating unlawfully against any individual in hiring, firing, or recruitment or referral practices because of his or her national origin or, in the case of a protected individual as defined in section 274B(a)(3) of the INA, because of his or her citizenship status. The Employer understands that such illegal practices can include selective verification or use of E-Verify, discharging or refusing to hire eligible employees because they appear or sound "foreign", and premature termination of employees based upon tentative nonconfirmations, and that any violation of the unfair immigration-related employment practices provisions of the INA could subject the Employer to civil penalties pursuant to section 274B of the INA and the termination of its participation in E-Verify. If the Employer has any questions relating to the anti-discrimination provision, it should contact OSC at 1-800-255-7688 or 1-800-237-2515 (TDD).

12. The Employer agrees to record the case verification number on the employee's Form I-9 or to print the screen containing the case verification number and attach it to the employee's Form I-9.

13. The Employer agrees that it will use the information it receives from the SSA or DHS pursuant to E-Verify and this MOU only to confirm the employment eligibility of newly-hired employees after completion of the Form I-9. The Employer agrees that it will safeguard this information, and means of access to it (such as PINS and passwords) to ensure that it is not used for any other purpose and as necessary to protect its confidentiality, including ensuring that it is not disseminated to any person other than employees of the Employer who are authorized to perform the Employer's responsibilities under this MOU.

14. The Employer acknowledges that the information which it receives from SSA is governed by the Privacy Act (5 U.S.C. § 552a (i) (1) and (3)) and the Social Security Act (42 U.S.C. 1306(a)), and that any person who obtains this information under false pretenses or uses it for any purpose other than as provided for in this MOU may be subject to criminal penalties.

15. The Employer agrees to allow DHS and SSA, or their authorized agents or designees, to make periodic visits to the Employer for the purpose of reviewing E-Verify -related records, i.e., Forms I-9, SSA Transaction Records, and DHS verification records, which were created during the Employer's participation in the E-Verify Program. In addition, for the purpose of evaluating E-Verify, the Employer agrees to allow DHS and SSA or their authorized agents or designees, to interview it regarding its experience with E-Verify, to interview employees hired during E-Verify use concerning their experience with the pilot, and to make employment and E-Verify related records available to DHS and the SSA, or their designated agents or designees. Failure to comply with the terms of this paragraph may lead DHS to terminate the Employer's access to E-Verify.

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ARTICLE III

REFERRAL OF INDIVIDUALS TO THE SSA AND THE DEPARTMENT OF HOMELAND SECURITY

A. REFERRAL TO THE SSA

1. If the Employer receives a tentative nonconfirmation issued by SSA, the Employer must print the tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation.
2. The Employer will refer employees to SSA field offices only as directed by the automated system based on a tentative nonconfirmation, and only after the Employer records the case verification number, reviews the input to detect any transaction errors, and determines that the employee contests the tentative nonconfirmation. The Employer will transmit the Social Security Number to SSA for verification again if this review indicates a need to do so. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.
3. If the employee contests an SSA tentative nonconfirmation, the Employer will provide the employee with a referral letter and instruct the employee to visit an SSA office to resolve the discrepancy within 8 Federal Government work days. The Employer will make a second inquiry to the SSA database using E-Verify procedures on the date that is 10 Federal Government work days after the date of the referral in order to obtain confirmation, or final nonconfirmation, unless otherwise instructed by SSA or unless SSA determines that more than 10 days is necessary to resolve the tentative nonconfirmation..
4. The Employer agrees not to ask the employee to obtain a printout from the Social Security Number database (the Numident) or other written verification of the Social Security Number from the SSA.

B. REFERRAL TO THE DEPARTMENT OF HOMELAND SECURITY

1. If the Employer receives a tentative nonconfirmation issued by DHS, the Employer must print the tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation.
2. If the Employer finds a photo non-match for an alien who provides a document for which the automated system has transmitted a photo, the employer must print the photo non-match tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the finding.
3. The Employer agrees to refer individuals to DHS only when the employee chooses to contest a tentative nonconfirmation received from DHS automated verification process or when

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the Employer issues a tentative nonconfirmation based upon a photo non-match. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.

4. If the employee contests a tentative nonconfirmation issued by DHS, the Employer will provide the employee with a referral letter and instruct the employee to contact the Department through its toll-free hotline within 8 Federal Government work days.

5. If the employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will provide the employee with a referral letter to DHS. DHS will electronically transmit the result of the referral to the Employer within 10 Federal Government work days of the referral unless it determines that more than 10 days is necessary.

6. The Employer agrees that if an employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will send a copy of the employee's Form I-551 or Form I-766 to DHS for review by:

- Scanning and uploading the document, or
- Sending a photocopy of the document by an express mail account (furnished and paid for by DHS).

7. The Employer understands that if it cannot determine whether there is a photo match/non-match, the Employer is required to forward the employee's documentation to DHS by scanning and uploading, or by sending the document as described in the preceding paragraph, and resolving the case as specified by the Immigration Services Verifier at DHS who will determine the photo match or non-match.

ARTICLE IV

SERVICE PROVISIONS

The SSA and DHS will not charge the Employer for verification services performed under this MOU. The Employer is responsible for providing equipment needed to make inquiries. To access the E-Verify System, an Employer will need a personal computer with Internet access.

ARTICLE V

PARTIES

This MOU is effective upon the signature of all parties, and shall continue in effect for as long as the SSA and DHS conduct the E-Verify program unless modified in writing by the mutual consent of all parties, or terminated by any party upon 30 days prior written notice to the others. Any and all system enhancements to the E-Verify program by DHS or SSA, including but not limited to the E-Verify checking against additional data sources and instituting new verification procedures, will be covered under this MOU and will not cause the need for a supplemental MOU that outlines these changes. DHS agrees to train employers on all changes made to E-Verify through the use of mandatory refresher tutorials and updates to the E-Verify manual. Even

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without changes to E-Verify, the Department reserves the right to require employers to take mandatory refresher tutorials.

Termination by any party shall terminate the MOU as to all parties. The SSA or DHS may terminate this MOU without prior notice if deemed necessary because of the requirements of law or policy, or upon a determination by SSA or DHS that there has been a breach of system integrity or security by the Employer, or a failure on the part of the Employer to comply with established procedures or legal requirements. Some or all SSA and DHS responsibilities under this MOU may be performed by contractor(s), and SSA and DHS may adjust verification responsibilities between each other as they may determine.

Nothing in this MOU is intended, or should be construed, to create any right or benefit, substantive or procedural, enforceable at law by any third party against the United States, its agencies, officers, or employees, or against the Employer, its agents, officers, or employees.

Each party shall be solely responsible for defending any claim or action against it arising out of or related to E-Verify or this MOU, whether civil or criminal, and for any liability wherefrom, including (but not limited to) any dispute between the Employer and any other person or entity regarding the applicability of Section 403(d) of IIRIRA to any action taken or allegedly taken by the Employer.

The employer understands that the fact of its participation in E-Verify is not confidential information and may be disclosed as authorized or required by law and DHS or SSA policy, including but not limited to, Congressional oversight, E-Verify publicity and media inquiries, and responses to inquiries under the Freedom of Information Act (FOIA).

The foregoing constitutes the full agreement on this subject between the SSA, DHS, and the Employer.

The individuals whose signatures appear below represent that they are authorized to enter into this MOU on behalf of the Employer and DHS respectively.

To be accepted as a participant in E-Verify, you should only sign the Employer's Section of the signature page. If you have any questions, contact E-Verify Operations at 888-464-4218.

Employer 3M Company

Kristyanne Nevin

Name (Please type or print)

Title

Electronically Signed

01/02/2008

Signature

Date

Department of Homeland Security – Verification Division

Company ID Number: 82942

USCIS Verification Division

Name (Please type or print)

Title

Electronically Signed

01/02/2008

Signature

Date



Diamond Grade™

DG³ Reflective Sheeting Series 4000

Product Bulletin 4000

January 2012

Description

3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 is a super-high efficiency, full cube retroreflective sheeting designed for the production of traffic control signs and delineators that are exposed vertically in service. DG³ sheeting is designed to have the highest retroreflective characteristics at medium and short road distances as determined by the R_A values at 0.5° and 1.0° observation angles in Table B. Performance at these observation angles represents the most common nighttime viewing geometries encountered by the driving public. During the daytime, Diamond Grade DG³ fluorescent reflective sheeting provides higher visibility than ordinary (non-fluorescent) colored sheetings.

Applied to properly prepared sign substrates Diamond Grade DG³ reflective sheeting provides long-term retroreflectivity and durability. Series 4000 sheeting is available in the following colors.

Color	Product Code
White.....	4090
Yellow.....	4091
Red.....	4092
Blue.....	4095
Green.....	4097
Brown.....	4099
Fluorescent Yellow - FY.....	4081
Fluorescent Yellow Green- FYG.....	4083
Fluorescent Orange - FO.....	4084

Color Product Code

White - thermal transfer printable	4090TT
Yellow - thermal transfer printable	4091TT
Fluorescent Yellow - TT printable	4081TT
Fluorescent Yellow - Green - TT printable . . .	4083TT

Photometrics

Daytime Color (x, y, Y)

The chromaticity coordinates and total luminance factor of the retroreflective sheeting conform to Table A.

Color Test – Fluorescent Sheetings

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 991 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

Color Test – Ordinary Colored Sheeting

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 1164 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

Table A - Daytime Color Specification Limits¹

Color	x y		x y		x y		x y		Daytime Luminance Limit (Y%)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	27	
Yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472	15	45
Red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5	15
Blue	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	1	10
Green	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	3	12
Brown	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390	1	9
FY	0.479	0.520	0.446	0.483	0.512	0.421	0.557	0.442	40	
FYG	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540	60	
FO	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355	20	

¹The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Colorimetric System.

²The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the Color Specification of Fluorescent Retroreflective Materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

Coefficients of Retroreflection (R_A)

The values in Table B are minimum coefficients of retroreflection expressed in candelas per lux per square meter ($cd/lux/m^2$).

Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements shall be determined by instrumental method in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting", and per E-810 the values of 0° and 90° rotation are averaged to determine the R_A in Table B.

Table B - Minimum Coefficient of Retroreflection R_A for new sheeting ($cd/lux/m^2$)

	-4° Entrance Angle ³		
	Observation Angle ⁴		
	0.2°	0.5°	1.0°
White	580	420	120
Yellow	435	315	90
Red	87	63	18
Green	58	42	12
Blue	26	19	5
Brown	17	13	4
Fluorescent Yellow	350	250	72
Fluorescent Yellow Green	460	340	96
Fluorescent Orange	175	125	36
30° Entrance Angle ³			
	0.2°	0.5°	1.0°
White	220	150	45
Yellow	165	110	34
Red	33	23	7
Green	22	15	5
Blue	10	7	2
Brown	7	5	1
Fluorescent Yellow	130	90	27
Fluorescent Yellow Green	180	120	36
Fluorescent Orange	66	45	14

³Entrance Angle – The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

⁴Observation Angle – The angle between the illumination axis and the observation axis.

Printed Colors and Overlay Films

For screenprinted or thermally transfer printed transparent color areas on white sheeting when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 70% of the value for the corresponding color in Table B. For white sheeting covered with 3M™ ElectroCut™ Film Series 1170 when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 100% of the value for the corresponding color in Table B. The color chromaticity and luminance shall conform to Table A on page 1.

Entrance Angularity Performance in Regard to Orientation

Diamond Grade DG³ Reflective Sheeting is designed to be an effective wide angle reflective sheeting regardless of its orientation on the substrate or ultimate orientation of the sign after installation. However, because the efficiency of light return from cube corner reflectors is not equal at all application orientations, especially with increasing entrance angles, it is possible to get the widest entrance angle light return when the sheeting is oriented in a particular manner. When high entrance angle ($>50^\circ$) performance is required for given signs (e.g. Keep Right Symbols), it can be obtained easily by specifying the application orientation of the completed signs. In these situations the completed sign should have the sheeting positioned at the 0° orientation (downweb direction perpendicular to the road).

When the "primary groove line" (or, flat side of the diamond shape) is vertical in the completed sign, sheeting is said to be at a 0° orientation. When the "primary groove line" (or, flat side of the diamond shape) is horizontal in the completed sign, the sheeting is said to be at a 90° orientation. (Figure 1)

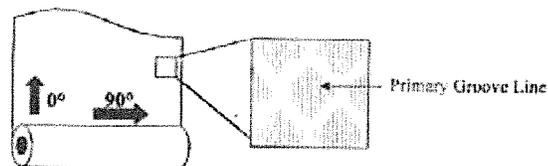


Figure 1

Unless the sign location and/or position calls for extra-wide entrance angularity performance, signs and applied copy (letters, arrows, borders and shields) can be fabricated and installed using the application orientation that most efficiently utilizes the reflective sheeting.

Note: For multi-panel signs it is recommended that all background panels be sheeted such that the sheeting direction is the same for all panels.

Fabrication Lines

The manufacture of prismatic sheeting results in lines being present in the product. In Diamond Grade DG³ sheeting these lines are slightly thicker than the seal pattern legs. Fabrication lines are noticeable in shop light but are not observable on the road either in daylight or at night under typical use conditions (Figure 2).

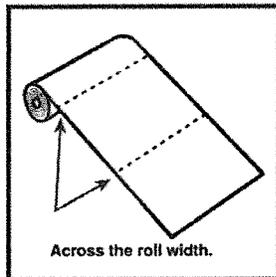


Figure 2 - Fabrication Lines

Adhesive

Diamond Grade DG³ sheeting has a pressure-sensitive adhesive that is recommended for application at temperatures of 65°F (18°C) or higher.

Adhesive and Film Properties

Standard Test Panels

Unless otherwise specified herein, sheeting shall be applied to test panels and conditioned in accordance with ASTM D4956 and test methods and conditions shall conform to ASTM D4956.

Properties

The following properties shall conform to the requirements in ASTM D4956.

1. Adhesion
2. Outdoor weathering
 - retained coefficient of retroreflection
 - colorfastness
3. Shrinkage
4. Flexibility
5. Liner removal
6. Impact resistance
7. Night time color

In addition, DG³ sheeting will conform to the following properties.

1. Gloss

Test Method – Test in accordance with ASTM D523 using a 60° glossmeter.

Requirement – Rating not less than 50.

2. Optical Stability

Test Method – Apply a 3-inch x 6-inch sample to a test panel. Measure R_A , then place it in an oven at $71^\circ\text{C} \pm 3^\circ\text{C}$ ($160^\circ\text{F} \pm 5^\circ\text{F}$) for 24 hours followed by conditioning at standard conditions for two hours.

Remeasure R_A .

Requirement – The sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection.

Sign Fabrication Methods

Application

Diamond Grade DG³ sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at temperature of 65°F/18°C or higher by any of the following methods:

Mechanical squeeze roll applicator – refer to 3M Information Folder (IF) 1.4. Application to extrusions that are edge wrapped requires sufficient softening of the sheeting. This can be accomplished by directing additional heat to the “next to last” edge roller. This practice will increase productivity and minimize cracking.

Hand squeeze roll applicator – refer to 3M IF 1.6.

Application of Diamond Grade DG³ sheeting for complete signs or backgrounds must be done with a roll laminator, either mechanical or hand driven.

Hand Application

Hand application is recommended for legend and copy only. Refer to 3M Information Folder 1.5 for more details.

Hand applications will show some visual irregularities, which are objectionable to aesthetically critical customers. These are more noticeable on darker colors. To obtain a close-up uniform appearance, a roll laminator must be used.

All direct applied copy and border MUST be cut at all metal joints and squeegeed at the joints.

Splices

Series 4000 sheeting must be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

Double Faced Signs

The sheeting on the bottom side of a double faced sign can be damaged if rolled through a squeeze roll applicator with an unprotected steel bottom roller. The use of a semi-soft flat sheet between the steel roller and the applied sign face will provide protection from damage. A material such as a rubber mat, tag board or cardboard is recommended.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extrusions. **Users are urged to carefully evaluate all other substrates for adhesion and sign durability.** Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy may require additional preparation such as flame treatment, mechanical abrasion or use of adhesion promoters prior to sheeting application. Guide sign extrusions may be edge wrapped. Flat panels or unwrapped extrusions are to be carefully trimmed so that sheeting from adjacent panels does not touch on assembled signs.

Diamond Grade DG³ sheeting is designed primarily for applications to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is required. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.**

Imaging

Diamond Grade DG³ sheeting may be processed into traffic signs by any of the imaging methods described below. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or matched component imaging materials other than those listed below.

Screen Processing

Diamond Grade DG³ sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I or Series 880N. Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. Refer to Information Folder 1.8 for details. No clear coating is required or recommended. Use of other process colors series is not recommended.

Care should be taken to avoid flexing DG³ sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.

Thermal Transfer Printing

Diamond Grade DG³ TT sheeting may be imaged with 3M™ Thermal Transfer Ribbon Series TTR2300 in conjunction with the Matan SprinG3 or Matan Spot4 thermal transfer printers. For regulated traffic signs, Series TTR2300 Spot Traffic Colors are to be applied using these printers and must be covered with 3M™ ElectroCut™ Film 1170. Refer to Product Bulletin TTR2300 for more information.

3M™ ElectroCut™ Film

3M™ ElectroCut™ Film Series 1170 may be used to provide transparent colored background copy for traffic control signs on Diamond Grade DG³ sheeting. Refer to Product Bulletin 1170 for fabrication procedures.

Applied Cut-Out Copy

Diamond Grade DG³ cut letters may be applied to a DG³ sheeting background to create a sign legend. Such cut-out copy may be directly applied to the background sheeting, or may be applied in a demountable form. Direct applied copy must be cut at all panel seams and carefully trimmed back so that sheeting from adjacent panels does not touch on assembled signs. Refer to Information Folder 1.10 for more information.

Note: It is recommended to fabricate all but the largest signs using 1170 electronic cuttable overlay film instead of direct applied copy.

Cutting

Diamond Grade DG³ sheeting may be cut into letters and shapes of at least three inches in height and stroke widths of at least one half inch. Smaller sizes are not recommended. Sealing cut edges of DG³ sheeting is not required.

Plotter Cutting

Programmable knife cut (electronic cutting)

1. Flat bed plotters can either die cut or kiss cut and offer the most consistent and reliable performance.
2. Friction Fed plotter. Kiss cut only. Success has been achieved using plotters that have 600 grams of down force and a 60° cutting blade. Additional drive wheels may need to be added to improve tracking. An alternative procedure is to cut sheeting from the liner side. Blade force and knife depth must be set to score but not cut through the topfilm. Break apart individual copy or apply premask to retain spacing.

Other Cutting Methods

Diamond Grade DG³ sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets being cut will significantly reduce damage. Maximum stack height for cutting Series 4000 sheeting is 1½ inch or 50 sheets. Details on cutting can be found in Information Folder 1.10.

Storage and Packaging

3M Diamond Grade DG³ Sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.

Screen processed signs must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face and pad the face with closed cell packaging foam. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.

Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. Refer to Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are required when twist style fasteners are used to mount the sign.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. Refer to 3M Information Folder 1.10.

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 any materials prior to handling or use.

General Performance Considerations

The durability of Diamond Grade DG³ sheeting and finished signs using 3M Matched Component materials will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. Maximum durability of Diamond Grade DG³ sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations provided in Information Folder 1.7. The user must determine the suitability of any nonmetallic sign backing for its intended use. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.** Applications to unprimed, excessively rough or non-weather resistant surfaces or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability. 3M process colors and ElectroCut™ Film, when used according to 3M recommendations, are generally expected to provide performance comparable to colored reflective sheeting. Custom colors, certain lighter colors, heavily toned colors or blends containing yellow or gold may have reduced durability. Atmospheric conditions in certain geographic areas may result in reduced durability.

Periodic sign inspection and regular sign replacement are strongly recommended in order for sign owners to establish their own effective service life expectation, beyond the warranty period.

3M Basic Product Warranty and Limited Remedy

3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 (“Product”) is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If DG³ Sheeting is proven not to have met the Basic Warranty on its shipment date, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, will be refund or replacement of the sheeting.

General Warranty Terms:

1. 3M makes the Additional Warranty (as defined below) as to any traffic control and guidance sign in the United States and Canada ("Sign") made with 3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 ("Product") and the Matched Component materials listed in Table E. Any Additional Warranty is contingent on all components involved in that Additional Warranty being stored, applied, installed, and used only as 3M recommends in its Product Bulletins and Other Product Information.

2. The Basic Warranty and any applicable Additional Warranty are collectively referred to as the "3M Warranty." EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS.

3. A Sign's failure to meet the 3M Warranty must be solely the result of the Product or the matched component materials' design or manufacturing defects. 3M has no obligation under the 3M Warranty if a sign failure is caused by:

improper fabrication, handling, maintenance or installation; non-vertical applications where the Sign face is more than +/- 10% from vertical; use of any material or product not made by 3M or not included in Table E; use of application equipment not recommended by 3M; failure of sign substrate; loss of adhesion due to incompatible or improperly prepared substrate; exposure to chemicals, abrasion and other mechanical damage; snow burial or any other sign burial; collisions, vandalism or malicious mischief.

4. 3M reserves the right to determine the method of replacement, and any replacement Product will have the remainder of the original Product's unexpired 3M Warranty. Claims made under this warranty will be honored only if

- The Sign was dated upon completion of fabrication ("Fabrication Date") using a permanent method (sticker, permanent marker or crayon, metal stamp, etc.)
- 3M is notified of a 3M Warranty claim during any applicable Warranty Period and the owner or fabricator provides the information reasonably required by 3M to verify if a 3M Warranty is applicable.

Additional Warranty & Limited Remedy for Ordinary colored Product

1. The Additional Warranty for a Sign made with ordinary colored Product is that the Sign will: (a) **remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision**, and (b) after cleaning, will meet the **minimum values for coefficient of retroreflection stated in Table C** for Table C's applicable Warranty Period measured from the Sign's Fabrication Date.

Table C – Minimum Percent Retained of Table B Initial R_A for applicable Warranty Period for Ordinary Colors (white, yellow, red, green, blue and brown)

Warranty Period	Minimum Percentage R_A Retained
1-7 Years	80%
8-12 Years	70%

2. If any Sign made with Ordinary Product is proven not to have met the Additional Warranty, then a buyer's **exclusive remedy**, and 3M's sole obligation, at 3M's option:

- (a) if this occurs within seven years after the Fabrication Date, then 3M will, at its expense, restore the Sign's surface to its **original effectiveness**; or
- (b) if this occurs during the remainder of the Additional Warranty Period, then 3M will furnish only the necessary 3M sheeting Product and matched component materials quantity to restore the Sign's surface to its original effectiveness.

Additional Warranty & Limited Remedy for Fluorescent Product

1. The Additional Warranty for a Sign made with Fluorescent Product is that the Sign will: (a) **remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision**; (b) after cleaning, will **retain 70% of the minimum values for coefficient of retroreflection stated in Table B** for the applicable Warranty Period stated in Table D, measured from Fabrication Date; and (c) after cleaning, the fluorescent Product will **maintain daytime luminance equal to or greater than the minimums specified in Table A**.

Table D – Warranty Period for Fluorescent Colors.

Color	Warranty Period
Fluorescent Yellow	10/7 Years ⁵
Fluorescent Yellow Green	10/7 Years ⁵
Fluorescent Orange	3 Years

⁵ Due to climatic conditions, Signs in Alabama, Arizona, Florida, Georgia, Hawaii, Louisiana, Mississippi, New Mexico, South Carolina and Texas have the 7-year Additional Warranty Period.

2. If a Sign made with Fluorescent Product is proven not to have met the Additional Warranty, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option:

(a) for those Fluorescent Products with a 10-year Additional Warranty Period, 3M will, at its expense: (a) restore the Sign’s surface to its **original effectiveness** if this occurs within seven years after the Fabrication Date; or (b) furnish only the necessary 3M Fluorescent Product and matched component materials quantity to restore the Sign’s surface to its original effectiveness if this occurs during the remainder of the Warranty Period.

(b) for those Fluorescent Products with a 7-year Additional Warranty Period, 3M will, at its expense: (a) restore the Sign’s surface to its **original effectiveness** if this occurs within five years after the Fabrication Date; or (b) furnish only the necessary 3M Fluorescent Product and matched component materials quantity to restore the Sign’s surface to its original effectiveness if this occurs during the remainder of the Warranty Period.

(c) for those Fluorescent Products with a 3-year Additional Warranty Period, 3M will furnish only the necessary Fluorescent Product and matched component materials quantity to restore the Sign’s surface to its original effectiveness.

Table E. Matched Component Materials.

Matched Components	
Process Colors	Series 880I
Process Colors	Series 880N
Thermal Transfer Ribbons – Spot Traffic Colors only*	Series TTR2300
ElectroCut™ Film	Series 1170
Premium Protective Overlay Film	Series 1160
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

* Must be covered with 3M™ ElectroCut™ Film 1170

Refer to 3M Information Folders and Product Bulletins for detailed information about recommended application procedures and equipment.

Other Product Information

Always confirm that you have the most current version of the applicable Product Bulletin, Information Folder or Other Product Information.

- IF 1.4 Instructions for Interstate Squeeze Roll Applicator
- IF 1.5 Hand Application Instructions
- IF 1.6 Hand Squeeze Roll Applicator
- IF 1.7 Sign Base Surface Preparation
- IF 1.8 Process Color Application Instructions
- IF 1.10 Cutting, Premasking, and Prespacing
- IF 1.11 Sign Maintenance Management
- PB 880I Process Color 880I
- PB 880N Process Color 880N
- PB 1170 ElectroCut™ Film
- PB TTR2300 Thermal Transfer Ribbons Series TTR2300
- PB 1160 Protective Overlay Film 1160

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ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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Fluorescent Orange Prismatic Work Zone Sheeting Series 3924S Sheeting With Pressure Sensitive Adhesive

Product Bulletin 3924S

February 2012

Replaces PB 3924S dated Oct. 2007

Description

3M™ Fluorescent Prismatic Reflective Sheeting Series 3924S is a microprismatic retroreflective sheeting designed for the production of durable traffic control signs for the work zone. The sheeting consists of prismatic lenses formed in a transparent resin, sealed, and backed with a pressure-sensitive adhesive and poly liner. Applied to properly prepared sign substrates, 3924S will provide long term service.

The pressure sensitive sheeting is available in roll widths up to 48 inches in a fluorescent orange work zone color.

Color	Product Code
Fluorescent Orange	3924S

Photometrics

Daytime Color (x,y,Y)

The chromaticity coordinates and luminance factor of the retroreflective sheeting conform to Table A below.

Color Test – Fluorescent Sheatings

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 991 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

²The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the color Specification of Fluorescent Retroreflective materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

Coefficients of Retroreflection (RA)

The values in Table B are minimum coefficients of retroreflection expressed in candelas per lux per square meter (cd/lux/m²).

Table A - CIE Daytime Chromaticity Coordinate Limits¹

Color	1		2		3		4		Luminance Factor Y (%) Min.
	x	y	x	y	x	y	x	y	
Orange	.583	.416	.535	.400	.595	.351	.645	.355	25

¹The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System.

Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements shall be determined by instrumental method in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting" and per E-810 the values of 0° and 90° rotation are averaged to determine conformance to the R_A limits in Table B.

Table B - Minimum Coefficient of Retroreflection R_A for new fluorescent sheeting (cd/lux/m²)

-4° Entrance Angle ¹	Observation Angle ²	
	0.2°	0.5°
Orange	230	75
30° Entrance Angle ¹	Observation Angle ²	
	0.2°	0.5°
Orange	130	41

²Observation (Divergence) Angle - The angle between the illumination axis and the observation axis.

¹Entrance (Incidence) Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Adhesive

Series 3924S sheeting has a pressure-sensitive adhesive that is recommended for room temperature application. Room temperature application is defined as 60°F (16°C) or higher.

Adhesive and Film Properties

Standard Test Panels

Unless otherwise specified herein, sheeting shall be applied to test panels and conditioned in accordance with ASTM D4956 and test methods and conditions shall conform to ASTM D4956.

Properties

The following properties shall conform to the requirements in ASTM D4956.

1. Adhesion
2. Outdoor weathering
 - retained coefficient of retroreflection
 - colorfastness
3. Shrinkage
4. Flexibility
5. Liner removal
6. Impact resistance
7. Night time color

In addition, 3924S sheeting will conform to the following properties.

1. Gloss

Test Method – Test in accordance with ASTM D523 using a 60° glossmeter.

Requirement – Rating not less than 50.

2. Optical Stability

Test Method – Apply a 3 inch x 6 inch sample to a test panel. Measure R_A then place it in an oven at 71° C \pm 3° C (160°F \pm 5°F) for 24 hours followed by conditioning at standard conditions for 2 hours.

Remeasure R_A .

Requirement – The sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection.

Sign Fabrication Methods

Application

Series 3924S incorporates a pressure-sensitive adhesive and should be applied to the sign substrate at room temperature (60°F/16°C) or higher by any of the following methods:

Mechanical squeeze roll applicator - IF 1.4

Hand squeeze roll applicator - IF 1.6

*Note - never direct the Calrod™ heater at the sheeting during application. If the heater is needed to warm to the minimum application temperature of 60°F, direct it at the substrate only.

Hand Application

Hand application is recommended for legend and copy only. Refer to 3M Information Folder 1.5 for more details.

Hand applications will show some visual irregularities, which are objectionable to aesthetically critical customers. To obtain a close-up uniform appearance, a roll laminator must be used.

Splices

Series 3924S sheeting must be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extrusions. Users are urged to carefully evaluate all other substrates for adhesion and sign durability. Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy such as polyethylene and other plastics will require additional preparation such as flame treatment (preferred), mechanical abrasion or use of adhesion promoters prior to sheeting application. Flat panels are to be carefully trimmed so that sheeting from adjacent panels does not touch on assembled signs.

3924S sheeting is designed primarily for applications to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is required; however, this product has a universal adhesive and can be used on plastic (flame treated) substrates. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.

Imaging

Series 3924S sheeting may be processed into traffic signs by any of the imaging methods described below. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or imaging materials other than those listed below.

Screen Processing

Series 3924S sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I or Series 880N. Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. See Information Folder 1.8 for details. No clear coating is required and is not recommended. Use of other process colors series is not recommended. **Care should be taken to avoid flexing Series 3924S sheeting before and**

especially after screening to eliminate the possibility of cracking from improper handling techniques.

3M™ ElectroCut™ Film

3M™ ElectroCut™ Film 1175 black may be used to provide copy for traffic control signs on 3924S sheeting. Refer to Product Bulletin 1170 for fabrication procedures.

Vinyl Graphic Films

Scotchcal™ Vinyl Series 3650, Series 7720 and Series 7725 may be used to provide copy for traffic control signs on 3924S sheeting. Refer to Scotchcal™ product literature for more information.

Latex Ink Jet Printing

Series 3924S sheeting may be imaged with HP 789 series black latex ink in conjunction with the HP Designjet L25500 Printer, or with 792 series black latex ink in conjunction with the HP Designjet L26500 Printer. Refer to Information Folder 3.4 for more information.

Note: With the exception of 3M branded products, 3M does not represent that any printer or printer accessory recommended in 3M literature will meet customer requirements, any federal, state or local regulations or any applicable safety standards. Such determination is the responsibility of the printer owner.

Cutting

3924S sheeting may be cut into letters and shapes of at least 3 inches in height and stroke widths of at least 1/2 inch. Smaller sizes are not recommended. Sealing cut edges of 3924S sheeting is not required.

Plotter Cutting

Programmable knife cut (electronic cutting)

1. Flat bed plotters can either die cut or kiss cut and offer the most consistently reliable performance.
2. Friction Fed plotter. Kiss cut only. Success has been achieved using plotters that have 600 grams of down force and a 60° cutting blade. Additional drive wheels may need to be added to improve tracking. An alternative procedure is to cut sheeting from the liner side. Blade force and knife depth must be set to score but not cut through the topfilm. Break apart individual copy or apply premask to retain spacing.

Other Cutting Methods

3924S sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing

it down onto the sheets being cut will significantly reduce damage. Maximum stack height for cutting 3924S sheeting is 1 ½ inch or 50 sheets. Details on cutting can be found in Information Folder 1.10.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. Refer to Information Folder 1.10.

Storage and Packaging

Series 3924S sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.

Screen processed or printed signs must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face and pad the face with closed cell packaging foam. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened or printed faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.

Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. Refer to Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are required when twist style fasteners are used to mount the sign.

General Performance Considerations

The durability of 3924S sheeting and finished signs using 3M Matched Component materials will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. Maximum durability of 3924S sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared

aluminum according to 3M recommendations provided in Information Folder 1.7. The user must determine the suitability of any nonmetallic sign backing for its intended use. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M. Applications to unprimed, excessively rough or non-weather resistant surfaces or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability. Atmospheric conditions in certain geographic areas may result in reduced durability.

3M has tested the HP Designjet Printers and black latex inks: L25500 printer/series 789 black ink, and L25600 printer/series 792 black ink; and when applied within parameters defined in IF 3.4 the resulting sign performance is considered to be commensurate with typically expected sign life. However, this imaging system is not covered as part of the 3M Matched Component system noted in the General Warranty Terms.

3M Basic Product Warranty and Limited Remedy

3M™ Fluorescent Work Zone Sheeting Series 3924S (“Product”) is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If 3924S Sheeting is proven not to have met the Basic Warranty on its shipment date, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, will be refund or replacement of the sheeting.

General Warranty Terms:

1. 3M makes the Additional Warranty (as defined below) as to any traffic control and guidance sign in the United States and Canada (“Sign”) made with 3M™ Fluorescent Work Zone Sheeting Series 3924S (“Product”) and the Matched Component materials listed in Table D. Any Additional Warranty is contingent on all components involved in that Additional Warranty being stored, applied, installed, and used only as 3M recommends in its Product Bulletins and Other Product Information.

2. The Basic Warranty and any applicable Additional Warranty are collectively referred to as the “3M Warranty.” EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING

FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS.

3. A Sign's failure to meet the 3M Warranty must be solely the result of the Product or the matched component materials' design or manufacturing defects. 3M has no obligation under the 3M Warranty if a sign failure is caused by:

improper fabrication, handling, maintenance or installation; non-vertical applications where the Sign face is more than +/- 10% from vertical; use of any material or product not made by 3M or not included in Table D; use of application equipment not recommended by 3M; failure of sign substrate; loss of adhesion due to incompatible or improperly prepared substrate; exposure to chemicals, abrasion and other mechanical damage; snow burial or any other sign burial; collisions, vandalism or malicious mischief.

4. 3M reserves the right to determine the method of replacement, and any replacement Product will have the remainder of the original Product's unexpired 3M Warranty. Claims made under this warranty will be honored only if

– The Sign was dated upon completion of fabrication

("Fabrication Date") using a permanent method (sticker, permanent marker or crayon, metal stamp, etc.)

– 3M is notified of a 3M Warranty claim during any applicable Warranty Period and the owner or fabricator provides the information reasonably required by 3M to verify if a 3M Warranty is applicable.

Additional Warranty and Limited Remedy

1. The Additional Warranty for a Sign made with the Product is that the Sign will: (a) remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision, and (b) after cleaning, will meet the minimum values for coefficient of retroreflection stated in Table C for three years measured from the Sign's Fabrication Date.

- R_A shall be measured per ASTM E810.

- All measurements shall be made after cleaning according to 3M recommendations.

2. If any Sign made with the Product is proven not to have met the Additional Warranty, then a buyer's exclusive remedy, and 3M's sole obligation, at 3M's option, is that 3M will provide pro-rated replacement of the 3M materials.

Table C
Minimum Coefficient of Retroreflection and Luminance Factors
(All measurements shall be made after cleaning according to 3M recommendations)

	Minimum Coefficient of Retroreflection (R_A) cd/lux/m ² at -4° Entrance Angle		Minimum Luminance Factor (γ)
Color	Observation Angle	R_A	%
Orange	0.2	115	25

Table D. Matched Component Materials.

Matched Components	
Process Colors	Series 880I
Process Colors	Series 880N
ElectroCut™ Film	Series 1170
3M Scotchcal™ Black Vinyl Film	Series 3650, 7720, 7725
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

Refer to 3M Information Folders and Product Bulletins for detailed information about recommended application procedures and equipment.

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 any materials prior to handling or use.

Other Product Information

Always confirm that you have the most current version of the applicable Product Bulletin, Information Folder or Other Product Information.

- IF 1.4** Instructions for Interstate Squeeze Roll Applicator
- IF 1.5** Hand Application Instructions
- IF 1.6** Hand Squeeze Roll Applicator
- IF 1.7** Sign Base Surface Preparation
- IF 1.8** Process Color Application Instructions
- IF 1.10** Cutting, Premasking, and Prespacing
- IF 1.11** Sign Maintenance Management
- PB 880I** Process Color 880I
- PB 880N** Process Color 880N
- PB 1170** ElectroCut™ Film
- IF 3.4** Ink Jet Imaging with HP Designjet L25500 Printer and HP 789 Series latex Inks

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Diamond Grade™ DG³ Barricade Sheeting

Series 444/446 Orange and White Prestriped Sheeting For Use on Barricades

Product Bulletin 444/446

April 2011

Replaces PB DG6 dated July 2007

Description

3M™ Diamond Grade™ DG³ Barricade Sheeting Series 444/446 is prestriped orange and white (OW) sheeting intended for reflectorizing work zone traffic control barricades. Series 444/446 OW sheeting is designed for use on aluminum or wood substrates as detailed in Information Folder 1.7.

Although series 444/446 OW sheetings have worked well on some flat plastic substrates, the variability of plastics precludes making any general recommendations regarding application to them. Users must assess for themselves the suitability of 444/446 OW series sheetings on plastic substrates.

Diamond Grade sheeting series 444/446 OW consists of impact resistant prismatic lens reflective sheetings precoated with aggressive pressure sensitive adhesive and available in the following prestriped configurations:

Table I - Barricade Sheeting Configuration

	<u>Orange/White</u>
6" left stripe	446-6L OW
6" right stripe	446-6R OW
4" left stripe	444-4L OW
4" right stripe	444-4R OW

Note: "Left" sheetings have stripes that slope from upper left to lower right and are placed on the right to move traffic to the left. Right sheetings are the opposite.

Photometric - Coefficients of Retroreflection

The values in Table II are minimum coefficients of retroreflection expressed in candelas per foot candle per square foot (candelas per lux per square meter).

Table II

**Minimum Coefficient of Retroreflection R_A
Candelas per Foot Candle per Square Foot
or Candelas per Lux per Square Meter
(Average 0° and 90° Rotation)**

Observation ¹ Entrance ²		White	Orange
Angle	Angle		
0.2	-4	570	300
0.2	+30	210	120
0.2	+45	65	35
0.5	-4	400	80
0.5	+30	150	75
0.5	+45	30	18

¹Observation Angle - The angle between the illumination axis and the observation axis.

²Entrance Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Measurements are made in accordance with ASTM E810 "Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting". The observation angles shall be 0.2° and 0.5°, the entrance angle (B₁) shall be -4°, +30°, and +45°, and the entrance angle (B₂) = 0°. All measurements shall be made after cleaning according to 3M recommendations.

Table III Color Specification Limits ** (Daytime)										
Color	1		2		3		4		Reflectance Limit (Y) (%)	
	X	Y	X	Y	X	Y	X	Y	Min.	Max.
White	.303	.300	.368	.366	.340	.393	.274	.329	40	
Orange	.558	.352	.636	.364	.570	.427	.506	.404	7	27

** The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 standard colorimetric system measured with standard illuminant D65.

Color

Colors of the sheeting applied to aluminum test panels shall conform to the requirements of Table III when measured in accordance with ASTM E 1164. The values shall be determined on a Hunter Color Flex Model 45/0 spectrophotometer with option CMR 559 or equivalent. Computations shall be done in accordance with ASTM E308 for the 2° observer.

Recommended Application Procedures

Series 444/446 OW sheetings may be applied to barricade panels using a squeeze roll applicator or by hand.

The application temperature (and substrate temperature) should exceed 60°F. If hand applied, sheeting should be applied with firm pressure using a plastic squeegee or rubber roller.

3M recognizes that some customers will choose to apply 444/446 OW series sheetings to plastic substrates. Without endorsement of the use of such substrates, some comments regarding their use can be made.

Plastics, including fiberglass laminates, vary as to type, composition, and manufacture, so that their use as an application surface requires careful evaluation under actual use conditions. Some plastics embrittle on exposure and some plastics contain migrating constituents that may contaminate the adhesive or cause sheeting discoloration and adversely affect performance. Also, some plastics are affected by ingredients in the sheeting adhesives that migrate into the panel. Sheeting must NOT be applied to transparent or translucent materials as light transmission may adversely affect adhesion.

Information Folder 1.7 may provide further insight into applications on plastic substrates.

Note: Care must be taken to avoid stretching series 444/446 OW sheetings during application.

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.

General Performance Considerations

The durability of Series 444/446 OW barricade sheeting will depend upon many factors including, but not limited to, substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance.

The user must determine the suitability of this material on any specific substrate (plastic, metal, or wood) for its intended use. Maximum durability can be obtained by following the recommendations contained in Information Folder 1.7 on Sign Base Surface Preparation. Applications on unprimed, excessively rough or non-weather-resistant surfaces, some plastics, or exposure to severe or unusual conditions can reduce the durability of such applications.

Warranty

3M warrants that Diamond Grade™ DG³ Barricade Sheeting Series 444/446 OW sold by 3M to be used as components for traffic control devices will remain effective for its intended use for three years, subject to the following provisions:

If a Diamond Grade DG³ barricade sheeting is applied to barricade blank materials in accordance with all 3M application and fabrication procedures provided in 3M's product bulletins, information folders and technical memos (which will be furnished upon request), including the exclusive use of 3M recommended application equipment; and if the barricade panel deteriorates within three years due to natural causes to the extent that:

1) the panel is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision, or 2) the coefficient of retroreflection is less than 50% of the values given in Table II, 3M's sole responsibility and purchaser's and user's exclusive remedy shall be that 3M will provide pro-rata replacement of the 3M materials.

Conditions

Such failure must be solely the result of design or manufacturing defects in the Diamond Grade™ DG³ barricade sheeting and not of outside causes such as: improper fabrication, handling, maintenance or installation; use of application equipment not recommended by 3M; failure of substrate; exposure to chemicals, abrasion and other mechanical damage from fasteners used to mount the barricade panel; collisions, vandalism or malicious mischief.

3M reserves the right to determine the method of replacement.

Replacement sheeting will carry the unexpired warranty of the sheeting it replaces.

Claims made under this warranty will be honored only if the panels have been dated at the time of sheeting application, which constitutes the start of the warranty period.

Claims made under this warranty will be honored only if 3M is notified of a failure within a reasonable time, reasonable information requested by 3M is provided, and 3M is permitted to verify the cause of failure.

Limitation of Liability

3M's liability under this warranty is limited to replacement as stated herein, and 3M assumes no liability for any incidental or consequential damages, such as lost profits, business or revenues in any way related to the product regardless of the legal theory on which the claim is based. **THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING OR OF PERFORMANCE, CUSTOM OR USAGE OF TRADE.**

Literature

Sign Base Surface Preparation IF 1.7

FOR INFORMATION OR ASSISTANCE

CALL:

1-800-553-1380

IN CANADA CALL:

1-800-265-1840

Internet:

www.3M.com/tss

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Diamond Grade™ Flexible Work Zone Sheeting

Series 3910

For Use on Reboundable Plastic Traffic Control Devices

Product Bulletin 3910

September 2013

Replaces Product Bulletin 3910 dated September 2007

Description

3M™ Diamond Grade™ Flexible Work Zone Sheeting Series 3910 is a wide angle prismatic lens reflective sheeting intended for reflectorizing reboundable traffic control devices such as polyethylene drums, posts and tubes. Series 3910 is precoated with a pressure sensitive adhesive conforming to ASTM D 4956 Class 1 adhesive requirements. Fluorescent yellow (3911) and fluorescent orange (3914) are visible-activated fluorescent reflective sheetings as defined in ASTM E991.

Series 3910 is available in the following colors:

Product No.	Color
3910	White
3911	Fluorescent Yellow
3914	Fluorescent Orange

Photometrics

Daytime Color (x,y,Y)

The chromaticity coordinates and luminance factor of the retroreflective sheeting conform to Table A below.

Color Test – Fluorescent Color

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements should be determined by instrumental method in accordance with ASTM E 991 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

Color Test – Ordinary Color

Conformance to standard chromaticity (x,y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 1164 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

²The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the Color Specification of Fluorescent Retroreflective Materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

Table A- CIE Chromaticity Coordinate Limits⁽¹⁾ and Luminance Factor Minimums

Color	1		2		3		4		Luminance Factor Min.
	x	y	x	y	x	y	x	y	
White	.303	.300	.368	.366	.340	.393	.274	.329	40
Fluorescent Yellow	.479	.520	.446	.483	.512	.421	.557	.442	45
Fluorescent Orange	.583	.416	.535	.400	.595	.351	.645	.355	25

⁽¹⁾The four pairs of chromaticity coordinates define the acceptable color limits for CIE D65 illumination in terms of the CIE 1931 Standard Colorimetric System.

**Photometrics
(continued)**

Coefficients of Retroreflection (R^A)

The values in Table B are minimum coefficients of retroreflection expressed in candelas per lux per square meter (cd/lux/m²).

Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements should be determined by instrumental method in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting."

Table B
Minimum Coefficient of Retroreflection R_A
Candelas per Footcandle per Square Meter
or (cd/lux/m²)

3910 White

Observation ³ Angle	Entrance Angle ⁴		
	-4°	30°	45°
0.1	1000	600	180
0.2	550	300	130
0.5	200	100	50
1.0	15	10	7.5

3911 Fluorescent Yellow

Observation ³ Angle	Entrance Angle ⁴		
	-4°	30°	45°
0.1	450	180	150
0.2	300	120	100
0.5	135	51	40
1.0	15	10	7.5

3914 Fluorescent Orange

Observation ³ Angle	Entrance Angle ⁴		
	-4°	30°	45°
0.1	375	200	50
0.2	200	120	40
0.5	80	50	30
1.0	10	7.5	5

³ Observation (Divergence) Angle – The angle between the illumination axis and the observation axis.

⁴ Entrance (Incidence) Angle – The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Recommended Substrates & Application Procedure

3M™ Diamond Grade™ Flexible Work Zone Sheeting Series 3910 sheeting is designed for application to clean polyethylene-based work zone devices such as drums, tubes, and posts. The polyethylene substrate must be properly flame-treated or corona treated before sheeting application (see Information Folder 3.3 for substrate preparation). Application of Series 3910 sheeting to plasticized polyvinyl chloride (PVC) devices is NOT recommended.

The application temperature (and substrate temperature) should exceed 60°F (15°C), and the sheeting must be applied with firm pressure using a plastic squeegee or rubber roller.

Note: Care must be exercised to avoid misalignment during application. This sheeting will flex minimally and unusual stretching may cause minor wrinkles. These wrinkles do not affect product performance. Overlap splicing between a half inch to one inch is recommended.

Process Colors

Series 3910 may be screen processed before or after mounting on a substrate using 3M™ Process Colors Series 990. Series 990 must be clear coated with 4430R clear coat after the Series 990 inks air dry for three hours. Unprocessed sheeting and sheeting processed only with opaque black do not need to be clear coated. For screen processing use PE157 screen mesh and a fill pass. See Information Folder 1.8 for details.

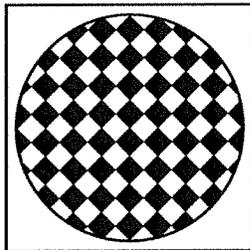
Interlocking Diamond Seal Pattern

Diamond Grade sheeting is differentiated from other prismatic or encapsulated lens sheeting by the distinctive seal pattern in the sheeting. Under normal light, this seal pattern will appear lighter in color than the reflective portion (see Figure 1).

Tooling Lines

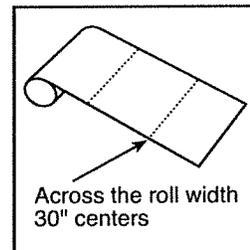
The manufacturing process of prismatic sheeting requires tooling lines. In Diamond Grade sheeting these lines are slightly thicker than the seal pattern legs and occur across the web. Tooling lines are more pronounced in shop light but cannot be seen on the road either in daylight or at night under typical use conditions (see Figure 2).

Figure 1



Interlocking Diamond Seal Pattern (enlarged)

Figure 2



Tooling Lines

Adhesive and Film Properties**Standard Test Panels**

Unless otherwise specified herein, sheeting should be applied to test panels and conditioned in accordance with ASTM D4956 and test methods and conditions should conform to ASTM D4956.

Properties

The following properties should conform to the requirements in ASTM D4956.

1. **Adhesion**
2. **Outdoor weathering**
 - retained coefficient of retroreflection
 - colorfastness
3. **Shrinkage**
4. **Flexibility**
5. **Liner removal**
6. **Impact resistance**
7. **Night time color**

In addition, Series 3910 sheeting will conform to the following properties.

1. **Gloss**

Test Method - Test in accordance with ASTM D523 using a 60° glossmeter.

Requirement - Rating not less than 50.

2. **Optical Stability**

Test Method - Apply a 3 inch x 6 inch sample to a test panel. Measure R_A then place it in an oven at $71^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($160^{\circ}\text{F} \pm 5^{\circ}\text{F}$) for 24 hours followed by conditioning at standard conditions for 2 hours.

Remeasure R_A .

Requirement - The sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection.

Cleaning

Sheetings that require cleaning should be flushed with water, then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the materials. Flush with water following washing. Do not use solvents to clean sheeting. See Information Folder 1.10.

Storage and Packaging

Series 3910 sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Devices such as drums should be stored or shipped vertically stacked to avoid scuffing during shipment.

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.

General Performance Considerations

The durability of 3M™ Diamond Grade™ Work Zone Sheeting Series 3910 will depend upon many factors including, but not limited to, substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. The user must determine the suitability of this material on any specific substrate for its intended use. Applications on unprimed, excessively rough or non-weather resistant surfaces, some plastics, or exposure to severe or unusual conditions can reduce the durability of such applications.

**3M Basic Product
Warranty and Limited
Remedy**

3M™ Diamond Grade™ Flexible Work Zone Sheeting Series 3910 (“Product”) is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If the product is proven not to have met the Basic Warranty on its shipment date, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, will be refund replacement of the sheeting.

General Warranty Terms

1. 3M makes the Additional Warranty (as defined below) as to any traffic control and guidance in the United States and Canada (“device”) made with 3M™ Diamond Grade™ Flexible Work Zone Sheeting Series 3910 (“Product”). Any Additional Warranty is contingent on all components involved in that Additional Warranty being stored, applied, installed, and used only as 3M recommends in its Product Bulletins and Other Product Information.
2. The Basic Warranty and any applicable Additional Warranty are collectively referred to as the “3M Warranty.” EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS.

**Additional Warranty
and Limited Remedy**

3M warrants that 3M™ Diamond Grade™ Flexible Work Zone Sheeting Series 3910 sold by 3M to be used as components for traffic control devices in the United States and Canada will remain effective for its intended use for three years, subject to the following provisions:

Warranty Policy⁵ for Series 3910 applied to Polyethylene Traffic Control Devices

Series 3910 that has been properly applied⁶ by a 3M Certified Manufacturer/OEM⁵ to a polyethylene device may be eligible for a warranty claim if:

- The device has been officially rejected by the DOT for sheeting performance or,
- Series 3910 sheeting demonstrates adhesion loss that compromises the retro-reflective performance of the device.

Please contact your 3M sales representative to initiate a warranty claim. If the sheeting is verified defective by 3M Technical Service then a buyer’s exclusive remedy, and 3M’s sole obligation, is that, 3M will credit a prorated amount of the reflective sheeting, device, transportation, and labor for replacement of the polyethylene device for up to three years, as set forth below:

0-12	Months	100%
13-24	Months	66%
25-36	Months	33%
36+	Months	0%

Control charting data as outlined under quality control in Information Folder 3.3 will be required for warranty consideration.

Note: All defective devices covered under this policy must be:

- Marked with sheeting application date.
- Available for pick up by 3M.

Conditions

Such failure must be solely the result of design or manufacturing defects in the 3M Diamond Grade flexible work zone sheeting and not of outside causes such as: improper fabrication, handling, maintenance or installation; use of process colors, thinners, coatings, or overlay films and sheeting not recommended in this bulletin or not made by 3M; use of application equipment not recommended by 3M; failure of device; exposure to chemicals, abrasion and other damage; snow burial or any other device burial; collisions, vandalism or malicious mischief.⁷

3M reserves the right to determine the method of replacement. Replacement sheeting will carry the unexpired warranty of the sheeting it replaces. Claims made under this warranty will be honored only if 3M is notified of a failure within a reasonable time, reasonable information requested by 3M is provided, and 3M is permitted to verify the cause of the failure.

⁵The warranty policy is effective following 3M OEM Certification. For 3M Certification, contact 3M Technical Service at 1-800-553-1380 extension 4.

⁶Please refer to 3M Information Folder 3.3.

⁷The following are not covered:

- Sheeting buckles, wrinkles or bubbles.
- Sheeting loss on a device that has been caught under a vehicle and dragged on the pavement.
- Sheeting loss on a device that has been repaired by a non-3M Certified manufacturer/OEM.
- Sheeting loss on a device that has been refurbished.
- Sheeting loss on a device that is cracked or split (sheeting is not expected to hold the device together).

**Warranty
(continued)****Limitation of Liability and Remedies**

3M's liability under this warranty is limited to replacement or allowance as stated herein, and 3M assumes no liability for incidental or consequential damages such as lost profits, business or revenue in any way related to the product regardless of the legal theory on which the claim is based.

THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING OR PERFORMANCE, CUSTOM OR USAGE OF TRADE.

Literature Reference

Information Folder 1.7	Sign Base Surface Preparation
Information Folder 1.8	Color Application Instructions
Information Folder 1.10	Cutting, Matching, Premaking and Prespacing Instructions
Information Folder 3.3	Application Procedures for Applying 3M Reflective Sheeting to Reboundable Traffic Control Devices

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3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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Engineer Grade Prismatic Reflective Sheeting

Series 3430 with Pressure Sensitive Adhesive

Product Bulletin 3430-U.S.

October 2013

Replaces Product Bulletin 3430 dated July 2009

Description

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 is a non-metalized microprismatic lens retroreflective sheeting designed for production of reflective commercial signs and noncritical traffic control signs that are exposed vertically in service. Series 3430 sheeting can easily be identified by the visible integral “EGP” marking. When applied to properly prepared sign substrates, Series 3430 sheeting provides long-term reflectivity and durability. Series 3430 sheeting is available in the following colors.

Color	Product Code
White	3430
Yellow	3431
Red	3432
Blue	3435
Green	3437
Brown	3439

Sign Fabrication Methods

Application

Series 3430 sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at temperature of 65°F/18°C or higher by any of the following methods:

Mechanical squeeze roll applicator – Reference Information Folder 1.4.

Hand squeeze roll applicator — Reference Information Folder 1.6.

Hand application is recommended for copy only. See Information Folder 1.5.

All direct applied copy and border **MUST** be cut at all panel seams and squeegeed at the joint.

Splices

Series 3430 sheeting must be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other. This is to prevent buckling as the sheeting expands when subject to extreme temperature and/or high humidity levels.

Double Faced Signs

The sheeting on the bottom side of a double faced sign can be damaged if rolled through a squeeze roll applicator with an unprotected steel bottom roller. The use of a semi-soft flat sheet between the steel roller and the applied sign face will provide protection from damage. A material such as a rubber mat, tag board or cardboard is recommended.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extrusions. Users are urged to carefully evaluate all other substrates for adhesion and sign durability. Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy may require additional preparation such as flame treatment, mechanical abrasion or use of adhesion promoters prior to sheeting application.

Engineer grade prismatic sheeting is designed primarily for applications to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is required. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.**

Screen Processing

Engineer grade prismatic sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M™ Process Colors Series 880I or Series 880N. Series 880I or 880N process colors can be screened at 60–100°F (16–38°C) at relative humidity of 20–50%. A PE 157 screen mesh with a fill pass is recommended. Refer to Information Folder 1.8 for details. Clear coating is not required or recommended. Use of other process colors series is not recommended. **Care should be taken to avoid flexing series 3430 sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.**

For screenprinted areas on white sheeting when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 70% of the value for the corresponding color in Table A. The color chromaticity and luminance shall conform to Table B.

Cutting and Matching

Engineer grade prismatic sheeting may be cut into letters and shapes of at least three inches in height and stroke widths of at least one half inch. Smaller sizes are not recommended. Sealing cut edges of Series 3430 sheeting is not required.

Plotter Cutting

Programmable knife cut (electronic cutting)

1. Flat bed plotters can either die cut or kiss cut and offer the most consistent and reliable performance.
2. Friction fed plotter. Kiss cut only. Success has been achieved using plotters that have 600 grams of down force and a 60° cutting blade. Additional drive wheels may need to be added to improve tracking. An alternative procedure is to cut sheeting from the liner side. Blade force and knife depth must be set to score but not cut through the topfilm. Break apart individual copy or apply premask to retain spacing.

Other Cutting Methods

Engineer grade prismatic sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets being cut will significantly reduce damage. Maximum stack height for cutting series 3430 sheeting is one and a half inch or 50 sheets. Details on cutting can be found in Information Folder 1.10.

Cleaning	Signs that require cleaning should be flushed with water, then washed with a detergent solution and a soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. See Information Folder 1.10.
Storage and Packaging	<p>3M™ Engineer Grade Prismatic Sheeting should be stored in a cool, dry area, preferably at 65–75°F (18–24°C) and 30–50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.</p> <p>Screen processed signs must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face. Double faced signs must have the glossy side of the slipsheet against each face of the sign.</p> <p>Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.</p> <p>Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.</p> <p>Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. Refer to Information Folder 1.11 for instructions on packing for storage and shipment.</p>
Installation	Nylon washers are required when twist style fasteners are used to mount the sign.
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.
General Performance Considerations	<p>Minimum coefficient of retroreflection, chromaticity limits, and daytime luminance factor (Y%) for the engineer grade prismatic sheeting series 3430 are given in Table A and Table B, respectively.</p> <p>Durability Considerations The durability of 3M™ Engineer Grade Prismatic Sheeting and finished signs using 3M's matched component materials (Table C) will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. Maximum durability of series 3430 can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations. Periodic sign inspection and regular sign replacement are strongly recommended in order for sign owners to establish their own effective service life expectation beyond any durability warranty, if provided.</p> <p>Substrate Considerations The user must determine the suitability of any nonmetallic sign backing for its intended use. Substrate manufacturer recommendations for preparation should be followed as well as guidance provided in Information Folder 1.7. Applications to unprimed, excessively rough or non-weather resistant surfaces can shorten the performance of such applications. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.</p> <p>Exposure Considerations Exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability. Atmospheric conditions in certain geographic areas may result in reduced durability.</p> <p>Custom Process Colors Considerations Custom colors, certain lighter colors, heavily toned color or blends containing yellow or gold may have reduced durability.</p>

General Performance Considerations (Continued)

Table A — Minimum Coefficient of Retroreflection
Candelas/Foot Candle/Square Foot
Candelas/Lux/Square Meter

Obs. Angle ¹	Ent. Angle ²	White	Yellow	Red	Green	Blue	Brown
0.2	-4	70	50	14.5	9.0	4.0	2.0
0.2	+30	30	22	6.0	3.5	1.7	1.0
0.5	-4	30	25	7.5	4.5	2.0	1.0
0.5	+30	15	13	3.0	2.2	0.8	0.5

Reflectivity conforms to ASTM D 4956.

¹Observation Angle — The angle between the illumination axis and the observation axis.

²Entrance Angle — The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Table B — CIE Chromaticity Coordinate Limits

Color	x	y	x	y	x	y	x	y	Reflectance Limit (Y)	
									Min	Max
White	.303	.300	.368	.366	.340	.393	.274	.329	27.0	
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	15.0	45.0
Red	.648	.351	.735	.265	.629	.281	.565	.346	2.5	12.0
Blue	.140	.035	.244	.210	.190	.255	.065	.216	1.0	10.0
Green	.026	.399	.166	.364	.286	.446	.207	.771	3.5	9.0
Brown	.430	.340	.610	.390	.550	.450	.430	.390	4.0	9.0

Table C — Matched Component Materials

Matched Components	
Process Colors	Series 880I
Process Colors	Series 880N
Premium Protective Overlay Film	Series 1160
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

3M Basic Warranty and Limited Remedy

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 (“Product”) is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If the product is proven not to have met the Basic Warranty on its shipment date, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, will be refund or replacement of the sheeting.

Limitation of Liability and Remedies

3M WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO A BUYER FOR DIRECT (other than the applicable Limited Remedy stated above), SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS) IN ANY WAY RELATED TO A PRODUCT OR THIS PRODUCT BULLETIN, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

Literature Reference	Information Folder 1.4	Instructions for Squeeze Roll Applicator
	Product Bulletin 880I	3M™ Process Color Series 880I
	Product Bulletin 880N	3M™ Process Color Series 880N
	Information Folder 1.5	Hand Application Instructions
	Information Folder 1.6	Instructions for Hand Squeeze Roll Applicator
	Information Folder 1.7	Sign Base Surface Preparation
	Information Folder 1.8	Process Color Instructions
	Information Folder 1.10	Cutting, Matching, Premasking, and Prespacing Instructions
	Information Folder 1.11	Sign Maintenance Management

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3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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ElectroCut™ Film

Series 1170

Product Bulletin 1170

July 2007

Replaces PB 1170 dated January 2004

Description

3M™ ElectroCut™ Film Series 1170 is a durable, transparent, acrylic colored film coated with a transparent, pressure-sensitive adhesive that is protected by a removable liner available in the following colors.

<u>Color</u>	<u>Product Code</u>
Yellow	1171
Red	1172
Orange	1174
Blue	1175
Standard Green (Worboy)	1176
Green	1177
Black (Opaque)	1178
Brown	1179

Series 1170 is intended for use on 3M Reflective Sheeting as part of 3M's Matched Component System™ for signing. Series 1170 E.C. Film has a clear pressure-sensitive adhesive compatible with all the following 3M reflective sheetings used in permanent signing:

3M™ Reflective Sheeting

Engineer Grade Series 3290

High Intensity Grade Series 3870

High Intensity Prismatic Series 3930

Diamond Grade™ Series 3990 VIP

Diamond Grade™ Series 3970 LDP

Diamond Grade™ Series 3990T Translucent

Diamond Grade™ DG³ Series 4000

E.C. Film is designed with a special film liner for kiss-cutting on electronic cutting machines. Rolls are available prepunched for sprocket fed cutters or unpunched for flatbed or friction fed cutters. Colored E.C. Film is often used instead of silk

screened inks to provide transparent colored background copy for retroreflective street name signs and other traffic control signs. Various film widths are available to fabricate single sign panels up to 48" wide. For single panel signs requiring more than a single piece of sheeting or for multipanel signs such as guide signs, be sure to follow 3M color matching procedures in Information Folder 1.10 to achieve satisfactory results. **(For best color uniformity on a colored multipanel sign, make all panels from the same lot of E.C. Film.)**

Properties

Standard colors of series 1170 E.C. Films conform to appropriate retroreflective sheeting specifications – Federal Specification FP-96, Section 178.01 (a) and ASTM D4956 when applied over 3M™ Diamond Grade™ Reflective Sheeting Series 3970, 3990, 3990T or 4000, 3M™ High Intensity Grade Sheeting Series 3870 or 3930, or 3M™ Engineer Grade Sheeting Series 3290.

Due to the high transparency of 3M acrylic E.C. Films, retroreflective signs made with these E.C. Films give equal or better retroreflective performance than sheetings screened with transparent inks. Transparent blue, green, red, and yellow E.C. Films applied to white 3M™ Reflective Sheeting can be expected to give performance comparable to integrally colored reflective sheetings. The coefficient of retroreflection of the colored areas of E.C. Film signs will depend on both the overlay film transparency and the brightness of the white reflective substrate.

Table 1 gives the minimum and maximum coefficient of retroreflection (R_A values) for each transparent 1170 Series film as a percentage of the R_A of the white reflective background on which it is applied.

Table 1

Coefficient of retroreflection R_A * for colored E.C. Films applied over white retroreflective sheeting (expressed as % of white retroreflective sheeting background)

Transparent (R_A color/ R_A white background) x 100%		
Color	Minimum	Maximum
Green	13.0	20
Blue	6.5	20
Red	14.0	24
Yellow	60.0	80
Orange	30.0	-
Brown	5.0	-
Standard Green (Worboy)**	8.0	14

* R_A (cd/lux/m²) measurements shall be made at 0.2° observation angle, -4° entrance angle, and 0° rotation, per ASTM E-810.

**Standard green color for U.K., Australia, and New Zealand

Film Liner

Series 1170 films have a transparent film release liner designed to aid the cutting process and the removal of the film weed after cutting. The rolls of film come edge weeded on punched rolls to prevent adhesive build-up on sprocket fed cutters.

Storage

Store in a cool, dry area 65-75°F (18-24°C), 30-50% relative humidity, and use within one year from date of receipt.

Fabrication – Cutting and Application Procedures

Important Note: It is recommended that inside radius corner fonts be used when cutting series 1170 film. Read and follow the manufacturer's operating manual carefully for proper use of cutting equipment.

1. Adjust knife pressure to cut cleanly through the film without cutting into the liner. A 30 degree blade works best. Spacing between letters or numbers should be adjusted to the aesthetic preference of the user. Consult the operating manual for instructions on how to regulate spacing. **Note:** Do not cut at high speed on variable speed machines.

2. Avoid sharp bends when cutting and handling film as this may cause film to release from the liner.
3. After cutting is complete, lay sheets flat, face to face, back to back. Always store sheets in this manner until the sheeting has been weeded and transfer tape has been applied to sheeting.
4. Use a stripping tool designed for weeding films that has a blunt (not a sharp) edge.
5. After weeding is completed, store sheets flat, face to face and back to back, until transfer tape is applied.
6. TPM-5 Clear Transfer Tape is recommended for best results. SCPM-3 Application Tape is also satisfactory for use on small signs. Other transfer tapes are not recommended.
7. Transfer tape can be applied either by hand using a plastic squeegee or through a hand squeeze roll laminator. If applying the transfer tape by hand, care must be taken to **always** squeegee from the center to the outside in both directions. If applying the transfer tape through the HSRA, the “lead” edge must be cut square and fed into the nip very carefully to avoid wrinkles in the E.C. Film.
8. Series 1170 film may be applied to the sheeting either before or after the sheeting has been applied to the substrate. Series 1170 film can be applied to Engineer Grade sheeting series 3290, High Intensity Grade sheeting series 3870 and 3930, Diamond Grade™ sheeting series 3970, 3990, 3990T and 4000. Use of a hand squeeze roll laminator is recommended to ensure satisfactory results. Use the “split liner method” – start in the middle of the sheet and remove half the liner to ensure proper alignment.
9. After series 1170 film and sheeting have been applied, remove the transfer tape by carefully removing the tape at as low an angle as possible.
10. **IMPORTANT!** When the transfer tape has been removed, reroll the sign through the laminator to ensure good adhesion.
11. A clean cutting blade is required. To remove adhesive build-up use a soft cloth dampened with mineral spirits, isopropyl alcohol or 3M Natural Cleaner.

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.

General Performance Considerations

All existing field performance warranties for the reflective sheetings remain in effect when series 1170 film is applied over recommended Reflective Sheetings.

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3M

Scotchlite™

Protective Overlay Film

Series 1150

Product Bulletin 1150

August 1996

Replaces PB 1150 dated December 1994

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.

Description

3M™ Scotchlite™ Protective Overlay Film Series 1150 is a durable, solvent resistant, transparent film coated with a transparent pressure-sensitive adhesive that is protected by a removable liner. It is designed as a protective transparent overlay for application to scotchlite reflective sheeting. When applied as a protective overlay on retroreflective signs, the signs will have similar day-night appearance. To facilitate application, the film is provided with premask. Film without application tape is available as 1150A.

Properties

A. Color and Transparency

Protective Overlay Film 1150 is a clear, colorless film. Used as an overlay, it will cause some reduction in retroreflectivity of the sign.

Brightness reduction will vary with photometric test geometry and the combination of sheetings and films used. User should determine if this reduction in brightness is acceptable for the sign's intended use.

B. Film

As a protective overlay, the film is a barrier to staining by many types of graffiti including spray paint, permanent markers, lipstick, etc. Defacement due to vandals usually may be removed by selected solvent wiping.

C. Adhesive

The pressure sensitive adhesive is transparent.

Intended Use

A. Use Conditions

Overlay applications can be made on smooth, clean reflective sign surfaces when air and surface temperatures are above 60°F (16°C). New signs must be clean and the process colors completely dry and hard prior to applying the film.

Transparent colors for 3M™ Scotchlite™ High Intensity Grade Sheeting need not be clearcoated prior to overlay film application. Used sign surfaces should be cleaned prior to application, with detergent and water, rinsed, and thoroughly dried.

B. Application

One of the following methods is recommended.

1. Mechanical squeeze roll applicator - See Information Folder 1.4.
2. Hand squeeze roll applicator - See Information Folder 1.6.
3. Hand application - See Information Folder 1.5.

Note: To remove premask, lift edge of tape with fingernail or knife. Pull tape from film by pulling it back over itself at a very sharp angle.

Application of 1150A is best accomplished using a mechanical squeeze roll applicator. Use extra care when handling this film since it is NOT supported by premask. When threading the leading edge at start-up, application of a strip of tape (such as one inch vinyl tape) along the leading edge of the 1150A Film will minimize tearing during handling.

C. Packaging and Storage

Scotchlite protective overlay film should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity, and should be applied within one year after purchase.

Finished signs or faces with protective film applied need not be slipsheeted since both the film and the premask protect the finish. See Information Folder 1.11 for details of packaging and storage.

Warning: If the finished signs may be exposed to moisture, such as in an open truck or stored for long time periods, **REMOVE PREMASK.**

D. Cleaning

When protective overlay film is used to protect reflective sheeting and is defaced, it may be cleaned as follows.

Materials: In some instances, washing with detergent and water is sufficient to remove surface contamination; however, for paints and coatings, it may be cleaned with cleaning systems recommended for this purpose.

Important: Before using any cleaning materials, read and carefully follow seller's label instructions for proper application and safety instructions. Also avoid the use of formulations containing strong polar solvents such as ketones (acetone, methyl ethyl ketone) or methylene chloride (dichloromethane) and other chlorinated solvents as these may harm the overlay film after repeated cleanings or prolonged solvent exposure.

Procedure: Apply a liberal quantity of cleaning solution to a soft cloth. Rub onto defaced surface with a scrubbing motion so as to wet the surface. Wipe area clean with a clean, soft cloth. Do not use abrasive brushes or scouring pads. Repeat procedures if necessary.

Always follow cleaning solution with a detergent water rinse.

Recommended Cleaning Systems

1. 3M "Natural Cleaner"
2. 3M "Safest" Stripper
3. A blend of isopropyl alcohol and xylene (50/50)

General Performance Considerations

When applied in accordance with 3M recommended procedures, 3M™ Scotchlite™ Protective Overlay Film Series 1150 will not decrease the effective performance life of the Scotchlite reflective sheeting to which it is applied.

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1-800-265-1840

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Premium Protective Overlay Film

Series 1160

Product Bulletin 1160

December 2013

Replaces PB 1160 November 2011

Description

3M™ Premium Protective Overlay Film Series 1160 is designed as a high performance protective transparent overlay for use on signs made from 3M Traffic Safety and Security Division sheetings, films, and images. Series 1160 has been specifically developed for use over signs made from 3M™ Diamond Grade™ and High Intensity Prismatic Sheeting, and 3M's system of matched components, and is recommended for use with these materials. Many types of defacement from vandalism can be cleaned from this film to substantially restore performance and appearance of the overlaid sign. Two configurations are available:

1160: with premask

1160A: without premask

Important: *A complete understanding of these instructions is recommended before sheeting application.*

Properties

A. Color and Transparency

Series 1160 is a clear, colorless film. Application of Series 1160 to a sign fabricated using 3M's matched component systems will preserve the initial and retained minimum retroreflectance specified for the sheeting used to fabricate the sign.

B. Film

Series 1160 is a high performance fluoropolymer film that provides a barrier and resists staining from common graffiti including paints, permanent marker ink, lipstick, eggs and stickers and allows for easier clean-up.

C. Adhesive and Liner

Series 1160 utilizes a clear, transparent, and pressure sensitive adhesive and has an easily removable white paper liner.

D. Premask

To aid film handling, Series 1160 is provided with a white paper premask which is easily peeled away from the film after application. After removing the premask, reroll the sign through the laminator to ensure good adhesion.

Application**A. Use Conditions Before Overlaying Film**

1. Air and substrate temperatures should be above 60°F (16°C).
2. Signs must be clean and screen printed inks completely dry.

B. Equipment

1. Mechanical squeeze roll applicator – See Information Folder 1.4.
2. Hand squeeze roll applicator – See Information Folder 1.6.
3. A laminating roll with a hardness of 35 durometer (Shore A) is recommended to minimize tenting of Series 1160 over direct apply copy or 3M™ ElectroCut™ Film Series 1170.

NOTE: Application of 1160A Film is best accomplished using a mechanical squeeze roll applicator. Use extra care when handling this film since it is not supported with a premask.

C. Premasked Film (1160)

1. Remove the premask AFTER film application to sign by lifting edge of premask with fingernail or knife and pulling premask back over itself at a vary sharp angle using a steady, even tension.

Note: Edge trim BEFORE removing premask.

WARNING: Do not allow premask to be exposed to moisture. Premask must be removed before storage or shipment.

D. Trimming

1. Use a sharp cutting blade to trim film along edges. It may be helpful to grasp the edge of the unsupported overhanging film to create tension on that portion of the film while trimming.
2. The overhanging portion of the film on the TOP EDGE of the sign may be folded over smoothly and adhered to the back edge of the sign to minimize any water or dirt intrusion along the top edge of the sign. The backside of the sign must be properly cleaned before film is applied.

E. Additional Processing

1. DO NOT apply any inks, films, or sheetings in the form of copy or images over 1160 film since this film is designed to repel adhesion of such markings.

F. Splices

1. Creating film splices to overlay a sign is not recommended.

Packaging and Storage

- A. Store film in a cool, dry area, preferably 65- 75°F and 30-50 percent relative humidity.
 - B. Faces and signs covered with overlay film do not require slipsheeting. Follow recommendations given in Information Folder 1.11 regarding proper storage, packaging, handling, shipping, and installation.
 - C. Use within one year from date of receipt.
-

Cleaning**A. Materials**

- 1. To remove normal dirt accumulation from signs, use a soft cloth and mild detergent and water solution followed by thorough water rinse.
- 2. To remove other contaminations such as graffiti defacement, use commercially available cleaning systems recommended for this purpose. **Important: Before using any cleaning materials, read and carefully follow product label use and safety instructions. Test the cleaner on a small area of the sign to determine its suitability and to be sure it does not cause any unwanted results or damage to the performance of the sign.** Avoid the use of formulations containing strong polar solvents such as ketones (acetone, methyl ethyl ketone) or methylene chloride (dichloro methane) and other chlorinated solvents.

A cleaner such as 3M™ Citrus Cleaner can be effective for removal of common types of defacement such as from permanent marking pens, eggs, and stickers. A solvent such as isopropyl alcohol (IPA), or a 50/50 blend of IPA and xylene can be effective in removing paints and lacquers. Commercially available cleaners can also be highly effective. Although Series 1160 is resistant to strong solvents, prolonged exposure to solvents can result in permanent sign damage.

- 3. A pressure sensitive tape such as SCPM-3 from 3M also may be effective in removing certain paints and stickers. Simply roll or squeegee the tape firmly over the defaced area and carefully lift away the tape with the defacement from the overlay. Small amounts of residual defacement may require cleaning solutions as stated above to remove small areas that the tape method did not remove adequately. The sign needs to be completely dry for this method to be effective.
 - 4. Always use soft cloths. Do NOT use abrasive brushes, scouring pads or implements to scrape defacement from sign as these will likely damage the sign permanently.
-

3M Basic Product Warranty and Limited Remedy

3M™ Premium Protective Overlay Film Series 1160 (“Product”) is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If the Product is proven not to have met the Basic Warranty on its shipment date, then a buyer’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, will be refunded or replacement of the sheeting.

EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS

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.
General Surface Testing	3M™ Premium Protective Overlay Film Series 1160, when used according to the recommendation of 3M, can be expected to provide the same effective field performance as the sheeting on which it is applied. Series 1160 is designed to enable signs to be cleaned from many common types of defacement caused by vandalism. The film does not prevent defacement but allows the sign to be cleaned in many situations using recommended and conventional cleaners such that the performance and appearance of the original sign is substantially restored. This would include the occasional removal of such markings as common household spray paints, lipstick, permanent pen, eggs, and/or promotional stickers. Use of sharp implements, abrasive devices or certain types of strong and or corrosive chemicals to either deface the sign or used against recommendations to attempt to clean the sign could result in permanent damage to the overlay film and underlying sign which could severely reduce the performance expectation of the original sign. This overlay film is not intended to provide sign protection from impact, cutting, gouging, or pulling of the overlay film from the sign or from the use of strong chemicals that may damage the film and/or the underlying sign. Use of a flame or other high heat source and other such extreme abuse of overlaid signs would very likely severely reduce or destroy the sign's effectiveness permanently.
Literature References	Information Folder 1.4 Instructions for Operation of Squeeze Roll Applicator Information Folder 1.5 Hand Applications Instructions Information Folder 1.6 Instructions for Hand Squeeze Roll Application Information Folder 1.11 Storage, Maintenance & Removal Instructions

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Cutting, Premasking and Prespacing of 3M™ Reflective Sheetings

Information Folder 1.10

September 2010

Replaces IF 1.10 dated July 2007

Follow the Instructions

3M recommends only the standard practice outlined in this information folder. Procedures and materials which do not literally conform to these instructions are excluded. See warranty information in sheeting product bulletins.

Cutting Sheets

Reflective sheetings can be cut using a variety of techniques. Single sheets can be hand cut, die cut or electronically cut. Volume cutting can be accomplished by methods such as band sawing, roll cutting or guillotine cutting.

All cutting tools must be kept sharp and clean to minimize the possibility of damage to sheeting or film or adhesive transfer.

In order to reduce the possibility of stress cracking, the inside corners of cut out letters and symbols should be rounded using the largest radius consistent with acceptable appearance, but in no case less than 1/8-inch.

A. Electronic Cutting

All 3M reflective sheeting for permanent signing is electronic cuttable. Cutting can be accomplished on a flat bed plotter or friction fed plotter. Please contact 3M Traffic Safety Systems Division technical service for recommendations.

B. Hand Cutting

Single sheets may be hand-cut using a scissors, razor blade, or other cutting tool. The cutting edges must be kept sharp.

When cutting with a razor blade or other tool, lay the sheeting or film, liner side down, on a flat surface and cut from the face side.

C. Band Sawing General

A band saw can be used for general cutting of large sheets or for precision cutting of specific shapes.

1. Blade Selection

A "skip tooth" blade with few teeth per inch is used for cutting sheeting. It should have sufficient set for good clearance to prevent the teeth from filling. Blade specifications for two blades which have been used successfully are given below:

	Milford "Profile" Blade No. S-3104	Do-All "Buttress" Blade
Width	3/16"	3/16"
Pitch	4	4
Set	.042"	—
Gauge	.025"	.025"

The blade must be sharp in order to maintain a good edge when cutting curves and angles. When it dulls, the blade will begin to tear the sheeting, and must be changed.

2. Saw Speed/Stack Height

Corrected saw speeds are necessary for proper cutting. Do not use heavy pressure to accelerate cutting speed as it will overheat the blade.

Recommended speeds and the maximum number of sheets to be cut in one stack are listed on page 2.

D. Bandsawing Unprocessed Symbols and Legends

To cut symbols and legends from unprocessed sheeting, stack the material on a sheet of 1/4 inch plywood, and butt the sheetings tightly against guide boards set along the sides of the stack (Figure 1). When the stack is complete, cover with 1/8-inch wallboard upon which the pattern to be cut has been drawn or silk screened.

Drive nails through the stack and into the plywood to hold it in place, then remove the stack from the assembly fixture and saw as one piece. Note: If material is to be cut liner side up, layout must be drawn in reverse.

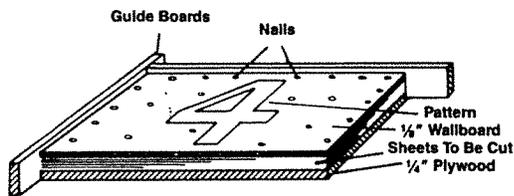


Figure 1

E. Bandsawing Printed Emblems and Copy

When printed markings or copy are to be sawed, make sure that each sheet in the stack is in register. This may be done by registering the sheets, during screen printing, against the guide boards when stacking the sheets for sawing (See Figure 1). For best results sheets should be squared at three points or more.

Another method to assure accurate stacking is to include register marks in the screen printing stencil so that the marks appear on each sheet (Figure 2). Screen the register marks on the plywood base, and drive a nail perpendicular from the bottom up through the plywood in the center of each register mark. Build the stack by pushing the nail through the center of each register mark on each sheet. When complete, the stack will be perfectly aligned and all sheets will be cut the same way.

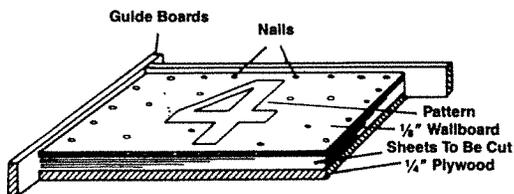


Figure 2

Not more than six sheets of 0.080 inch (2mm) or thicker aluminum may be cut in one stack; 10 sheets is the maximum stack height for aluminum which is less than 0.080: (2mm) thick.

F. Unmounted Bandsawing

Unmounted 3M reflective sheeting can be processed using a saw speed of 1000-1500 feet per minute and a maximum of 25 sheets.

G. Roll Cutting

Wide rolls can be cut to narrower widths using a roll cutting machine. The user must determine the accuracy and quality of cut for various sheetings.

H. Guillotine Cutter

Large volume cutting of straight edge sheets and markings can be easily and accurately accomplished using a guillotine-type cutter. The type and condition of the cutter and the technique employed will determine accuracy, tolerances, and quality of the cut. Evaluation of the process for the intended use is recommended prior to volume cutting.

The table under "Cutting Recommendations" gives maximum stack height for sheets 24 inches x 24 inches (61cm x 61cm) or larger. For smaller sheets reduce stack height accordingly.

Cardboard inserts can be used as counters in the larger stacks. If the bottom sheet(s) have a rough finish or small tabs after cutting, a piece of cardboard placed at the bottom of the stack will ensure a cleaner cut. Cardboard inserts are to be figured as a part of the total stack height. To clean the blade of residual adhesive material, paper and film dust, wipe periodically with a cloth soaked in mineral spirits, then dry the blades thoroughly.* Sharp cutting blades are essential for good, clean cuts. If a blade is being used on an average of 8 hours per day, it should be resharpened every ten days.

*When using solvents for clean-up, it is essential that proper precautionary measures for handling such materials be observed.

Certain sheetings should be double cut as specified in the "Cutting Recommendations" table since the bevel edge of the blade tends to crack these materials. Therefore, when trimming, waste portion of any stack to be cut should rest against bevel edge of blade (Figure 3). If a stack is to be cut in half, allow sufficient area for additional trim cut of that edge which rests against bevel edge of blade.

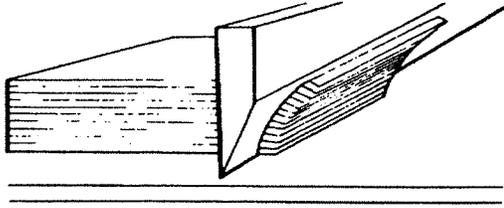


Figure 3

Some sheetings which have softer adhesives may tend to form tacky edges (adhesive ooze). To minimize ooze, the following procedures should be observed:

1. Ooze forms primarily on the flat side of the blade and not on the bevel side. Therefore, double cutting is not recommended.
2. Keep blade clean and sharp.
3. Cut in short stacks.
4. If adhesive ooze is encountered, it should be removed at the guillotine before the sheets are jobbed. Ooze can be removed easily by applying Scotch™ Masking Tape to the cut edge of the sheets. When the tape is removed, the adhesive ooze will adhere to the tape and be removed with the masking tape.
5. If adjustable, guillotine clamp bar pressure should be set at minimum.

I. Steel Rule Die Cutting

Large volume cutting can be effectively accomplished using the die cutting technique. Die cutting is usually done in a platen press so the work may be hand-fed. The material is fed into the press, using the same edges of the material, side guide and gripper edge that the printer uses for this register. With careful make-ready, the platen is raised until the entire die design is cutting cleanly. Single bevel and double bevel steel rule dies typically provide the best performance.

Radius corners are recommended on cut-out letters to avoid stress cracking. Minimum radius should be 1/8-inch on 3-inch letters. Care must be taken to insure prismatic sheeting is not damaged by the punching action of the die press.

Prespacing, Premasking and Transfer Tapes

Premasking and prespacing of sheeting simplifies the handling and application of markings and legends. 3M tapes fill these functions as follows:

Uses of Tapes

Application Aid

Application tapes when applied properly to mark sheeting, reduce stretching, wrinkling and air entrapment during hand application. The increased stiffness provided by the tape aids with the handling of marking (4 sq. ft. or larger), striping, intricate sign markings and for applications performed at high temperatures.

Imprinted Application Instructions

Application instructions and registry marks which aid in positioning and application can be imprinted on the surface of the tape.

Prespace Legends & Markings

Prespacing cut out letter legends eliminates the time-consuming layout of individual letters on the application surface.

Important: Color or clear processed sheeting must be dried thoroughly before application of tape. Follow drying procedure recommended for color and sheeting used.

<u>Tape</u>	<u>Recommended Use</u>
SCPS-2 Prespacing Tape (White)	For prespacing legends which may or may not be premasked and for electronic cut letters and emblems.
SCPM-3 Application Tape (White)	Application Aid: Provides rigidity when liner is removed, reduces film stretching, wrinkling, and air entrapment during hand application, particularly helpful during hot weather or when applying large or intricately shaped emblems and letters.
TPM-5 Transfer Tape (Clear)	For premasking or applying prespaced legends wherever a clear transfer tape is desirable. Recommended for Series 1170 film.

Hand Application of Tapes

Sheets from which emblems are to be cut should be left unmasked 1/8-inch to 1/4-inch (3-6mm) along one of the edges that form the registry corner. This corner will normally be used for registry during cutting and its edge must be free of tape. The untaped edge will be removed in final die-cutting or trimming.

A. Strip application tape from roll and lay adhesive side up on table (Figure 5).

B. Drop material to be premasked into position face down on tape (Figure 6).

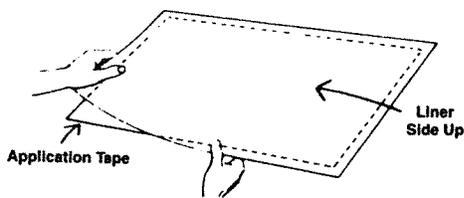


Figure 5

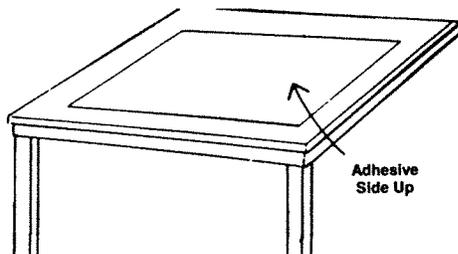


Figure 6

C. Squeegee to tape from center out (Figure 7).

D. Trim to size or cut to shape (Figure 8).

Prespacing of letters smaller than 3/4-inch (1.9cm) on filigree and other intricate designs with narrow stroke widths must be on a test and approval basis.

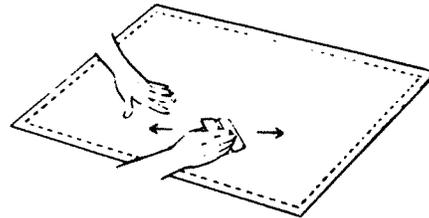


Figure 7

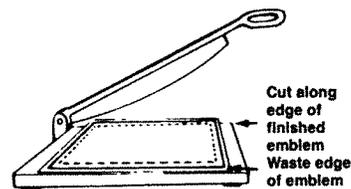


Figure 8

E. The 3M Hand Squeeze Roll Applicator may be used to apply premask, prespacing and transfer tapes. Reference IF 1.6.

F. Squeeze Roller Application

The Interstate Squeeze Roller Applicator may be used for premasking, prespacing and transfer tapes. Reference IF 1.4.

G. Storage

Store all tapes in a cool, dry area indoors and use tape within one year after date of purchase.

Store rolls of tape horizontally from the roll core. Do not expose tape to sunlight.

Taped sheeting should be applied within one year after assembly. Exposure to sunlight may cause the tape to permanently bond to the sheeting or film. Avoid stacking; if temporary stacking is necessary, follow stacking recommendations for sheeting or film being stacked.

H. Application of Premask or Prespaced Sheeting

The product combination of the taped sheeting may be applied by hand (IF 1.5), HSRAs (IF 1.6) or powered squeeze roll (IF 1.4).

Important: To remove premask pull back on itself at 180° angle. After removal of the transfer tape, always resqueegee or reroll the sheeting.

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.

Literature Reference

- IF 1.4 Instructions for the Interstate Squeeze Roll Applicator
- IF 1.5 Hand Application Instructions for Reflective Sheeting and Scotchal™ Films with PSA
- IF 1.6 Hand Squeeze Roll Applicators

FOR INFORMATION OR ASSISTANCE

CALL:

1-800-553-1380

IN CANADA CALL:

1-800-265-1840

Internet:

www.3M.com/tss

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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Traffic Safety Systems Division
3M Center, Building 0235-03-A-09
St. Paul, MN 55144-1000
1-800-553-1380
www.3M.com/tss

3M Canada Company
P.O. Box 5757
London, Ontario N6A 4T1
1-800-3MHELPS

3M México, S.A. de C.V.
Av. Santa Fe No. 55
Col. Santa Fe, Del. Alvaro Obregón
México, D.F. 01210

Please recycle.
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Bolger 10090095
Electronic Only

Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return) 3M Company	
	Business name/disregarded entity name, if different from above	
	Check appropriate box for federal tax classification (required): <input type="checkbox"/> Individual/sole proprietor <input checked="" type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C, S, corporation, P, partnership) ▶ <input type="checkbox"/> Exempt payee <input type="checkbox"/> Other (see instructions) ▶	
	Address (number, street, and apt. or suite no.) 3M Center City, state, and ZIP code St. Paul, MN 55144 List account number(s) here (optional)	Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number									
Employer identification number									
4	1	-	0	4	1	7	7	7	5

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
- I am a U.S. citizen or other U.S. person (defined below)

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here	Signature of U.S. person ▶ <i>[Handwritten Signature]</i>	Date ▶ <i>[Handwritten Date]</i>
-----------	---	----------------------------------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued).
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.



Bid Number 50 - 116411

Two year contract for a supply of reflective sheeting for the Jefferson Parish Department of Engineering.

MAY 12, 2016 AT 2:00 PM

ATTENTION VENDORS!!!

Please review all pages and respond accordingly, complying with all provisions in the technical specifications and Jefferson Parish Instructions for Bidders and General Terms and Conditions. All bids must be received in the Purchasing Department by the bid due date and time.

**Jefferson Parish Purchasing Department
200 Derbigny Street
General Government Building, Suite 4400
Gretna, LA 70053
Donna Reamey
Dreamey@Jeffparish.net
504-364-2684**

DATE: 4/26/2016

INVITATION TO BID
THIS IS NOT AN ORDER

BID NO.: 50-00116411

JEFFERSON PARISH
PURCHASING DEPARTMENT
P.O. BOX 9
GRETNA, LA. 70054-0009
504-364-2678

Page: 1

BUYER: DREAMY@jeffparish.net

BIDS WILL BE RECEIVED IN THE PURCHASING DEPARTMENT, SUITE 4400, JEFFERSON PARISH GENERAL GOVERNMENT BUILDING, 200 DERBIGNY STREET, GRETNA, LA 70053 UNTIL 2:00 PM, 5/12/2016 AND PUBLICLY OPENED THEREAFTER.

LATE BIDS WILL NOT BE ACCEPTED

Unless submitting via online (see Page 3), each bid must be submitted in a sealed envelope bearing on the outside; the name of the Bidder, his address, and the name of the project for which the bid is submitted and the bid number.

NOTE: ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOSTATIC FIGURES OR SIGNATURES SHALL RESULT IN BID REJECTION.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

THE FOLLOWING INSTRUCTIONS APPLY TO ALL BIDS

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647.

All vendors submitting bids must register as a Jefferson Parish vendor if not already yet registered. Bidders may be required to furnish current W-9 Forms and respective Tax Identification Numbers within 10 days after bid opening if such information is not on file or not up to date. Registration forms may be downloaded from www.purchasing.jeffparish.net and clicking on Vendor Information.

All quotations shall be based on F.O.B. Agency warehouse or job site, anywhere within the Parish as designated by the Purchasing Department. This provision does not apply to public works projects

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alterations from the specifications must be indicated and/or supporting documentation supplied with bid submission.

Bidders should submit all questions in writing and fax them to the Purchasing Department at (504) 364-2693 no later than FIVE (5) working days prior to bid opening. Bid numbers should be mentioned in all requests. Questions may also be emailed to the buyer for this bid at the email address listed above. If submitting online, vendors may send questions via the E-Procurement site no later than Five (5) working days prior to the bid opening.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum. Please note that all official communication will be expressed in the form of an addendum.

All formal Addenda require written acknowledgement on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected. JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications.

Visit our website at [HTTP://PURCHASING.JEFFPARISH.NET](http://PURCHASING.JEFFPARISH.NET)

JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. Vendors must not alter the bid forms. Doing so will cause the bid to be rejected.

If the bid exceeds \$30,000.00 and the company is duly authorized to do business in the state of Louisiana, a corporate resolution must be submitted with the bid or the person signing the bid documents must be listed on the Louisiana Secretary of State's website as an officer of the corporation, unless bidder has otherwise complied with LSA-R.S. 38:2212(B)(5). If the bid is in excess of \$30,000 and bidder is registered out of the state of Louisiana, a corporate resolution must be submitted with the bid, unless bidder has otherwise complied with LSA-R.S. 38:2212(B)(5). Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. Bids submitted by Owner or Sole Proprietorships must include certification that he or she owns the entity for which the bid is signed. Sole proprietors submitting bids for public works projects shall within 10 days after bid opening submit sole proprietorship certification.

NOTE: A sample corporate resolution can be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document. A sample certification of sole proprietorship can also be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

A. AWARD OF CONTRACT: JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE. IN THE EVENT OF SPLIT AWARD, THE PURCHASING DEPARTMENT MAY CONTACT VENDORS TO REQUEST REQUIRED AFFIDAVITS. THOSE VENDORS WILL HAVE 10 DAYS FROM THE DATE OF NOTICE TO SUBMIT COMPLETE, SIGNED AND NOTARIZED AFFIDAVITS IN ORIGINAL FORMATS.

All bid prices shall remain valid for 45 days. Jefferson Parish and the lowest responsive and responsible bidder(s) by mutual written consent may mutually agree to extend the deadline for award by one (1) or more extensions of thirty (30) calendar days.

Preference is hereby given to materials, supplies, and provisions produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside the state. "LSA-R.S.38:2251-2261"

B. USE OF BRAND NAMES AND STOCK NUMBERS: Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

C. CANCELLATION OF CONTRACT: JEFFERSON PARISH reserves the right to cancel all or any part if not shipped promptly. No charges will be allowed for parking or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel any contract at anytime and for any reason by issuing a THIRTY (30) day written notice to the contractor.

For good cause and as consideration for executing a contract with Jefferson Parish, vendor conveys, sells, assigns and transfers to Jefferson Parish or its assigns all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Louisiana, relating to the particular good or services purchased or acquired by Jefferson Parish.

D. PRICES: Jefferson Parish is exempt from paying sales tax under LSA-R.S. 47:301 (8)(c). All prices for purchases by Jefferson Parish of supplies and materials shall be quoted in the unit of measure specified and unless otherwise specified, shall be exclusive of state and Parish taxes. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit price shall prevail.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A17.1-1961).

Advertised bids will be tabulated and a copy of the tabulation will be forwarded to each responding bidder.

IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS

This Electronic Procurement System allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only. Please note requirements contained in this bid package for electronic bid submission.

Please visit the Purchasing Department webpage at <http://purchasing.jeffparish.net> to register and review Jefferson Parish solicitations.

The general specifications for construction projects and the purchase of materials, services and/or supplies are those adopted by the JEFFERSON PARISH Council by Resolution No. 113646 or 113647 dated 12/09/09. The general conditions adopted by this resolution shall be considered as much a part of this document as if they were written wholly herein. A copy may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at <http://purchasing.jeffparish.net> and clicking on Online Forms.

ADDITIONAL REQUIREMENTS FOR THIS BID

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

10,12,13,15

All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(l), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.

2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.
3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.
4. A LA State Contractor's License will be required in accordance with LSA R.S. 37-2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.
5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.
7. PUBLIC WORKS BIDS: All awards for public works in excess of \$5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.
8. NON-PUBLIC WORKS BIDS: A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.
9. NON-PUBLIC WORKS BIDS: A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.
10. Unless otherwise stated in the bid specifications, the successful bidder will be required to procure standard insurance policies evidencing Parish-mandated insurance requirements as indicted on the attached sheet. The current certificate of insurance must be submitted by low bidder within 10 days after bid opening to the Purchasing Department. Failure to comply will cause bid to be rejected. JEFFERSON PARISH reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies) If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.
12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations on warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.
13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.
14. PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required; Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit and E-Verify Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department on all solicitations for construction, alteration or demolition of public building or project, including but not limited to requirements found in LSA-RS 38:2212.9; LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1. Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.
15. NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required; Non-Collusion Affidavit, and Campaign Contribution Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department. See LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1 Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.

It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission: and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.

All Public Work Projects are required to use the Louisiana Uniform Public Work Bid Form

All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES _____ NO X

MAXIMUM ESCALATION PERCENTAGE REQUESTED NA %

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF 2 yrs from date of contract

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed, for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

DELIVERY: FOB JEFFERSON PARISH

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES

21 days or less

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable)

26495

THIS SECTION MUST BE COMPLETED BY BIDDER:

FIRM NAME: Protection Services Inc.

ADDRESS: 1011 Mamma Rd, Suite 101

CITY, STATE: Lemoyne, Pa. ZIP: 17043

TELEPHONE: (717) 236-9307 FAX: (717) 236-1281

EMAIL ADDRESS: dmiceli@neslo.com

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER: 1
NUMBER: _____
NUMBER: _____
NUMBER: _____

TOTAL PRICE OF ALL BID ITEMS: \$ 141,140.⁰⁰

AUTHORIZED SIGNATURE: [Signature]

Douglas Miceli

Printed Name

TITLE: Field Services Manager

SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.

NOTE: All bids should be returned with the BID NUMBER and BID OPENING DATE indicated on the outside of the envelope submitted to the Purchasing Department.

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00116411

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	200.00	SQFT	<p>TWO YEAR CONTRACT FOR A SUPPLY OF REFLECTIVE SHEETING FOR THE JEFFERSON PARISH DEPARTMENT OF ENGINEERING:</p> <p>0010 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING.</p> <p>SERIES 4000, DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES: WHITE 4090 RED 4092 GREEN 4097 BLUE 4095 YELLOW 4091</p> <p>3M SERIES 4090</p>	<p>\$ 4.45</p>	<p>\$ 890.00</p>
2	30,000.00	SQFT	<p>0020 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING,</p> <p>SERIES 4000, DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES FLOURESCENT: FLOURESCENT YELLOW - FY 4081 FLOURESCENT YELLOW GREEN - FYG 4083 FLOURESCENT ORANGE - FO 4084 FLOURESCENT ORANGE - FO 3924S</p> <p>3M SERIES 4080</p>	<p>\$ 4.55 4081 + 4083</p> <p>\$ 3.65 4084</p>	<p>\$ 136,500.00</p> <p>\$ 109,500.00</p> <p>\$ 75,000.00 ✓</p>
3	500.00	SQFT	<p>0030 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING,</p> <p>SERIES 4000. DIAMOND GRADE - DG3 OR APPROVED EQUAL, WITH PRESSURE SENSITIVE ADHESIVE.</p> <p>COLOR SERIES: ALTERNATING ORANGE AND WHITE PRE-STRIPED BARRICADE SHEETING WITH 4 INCH LEFT OR RIGHT STRIPES 444 OR 6 INCH LEFT OR RIGHT STRIPES 446</p> <p>3M SERIES 444/446</p>	<p>\$ 2.50 3924S</p> <p>4.40</p>	<p>\$ 2,200.00</p>
4	750.00	SQFT	<p>0040 SUPER HIGH EFFICIENCY, FULL CUBE PRISMATIC FLEXIBLE REFLECTIVE SHEETING,</p> <p>SERIES 4000, DIAMOND GRADE - DG3 SERIES 3910 AND 3914 OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE FOR REFLECTORIZING REBOUNDABLE PLASTIC SUBSTRATE WORK ZONE TRAFFIC CONTROL</p>	<p>4" \$ 4.75</p> <p>6" \$ 5.75</p>	<p>\$ 4312.50</p>

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
5	4,000.00	SQFT	DEVICES - 4 INCH OR 8 INCH COLORS WHITE AND ORANGE 3M 3910 WHITE 3M 3914 ORANGE		
			0050 ENCLOSED LENS REFLECTIVE SHEETING SERIES 3270 - ENGINEER GRADE OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE. EGP COLOR SERIES WHITE 3270 RED 3272 GREEN 3277 BLUE 3275 YELLOW 3271 BROWN 3279 3M SERIES 3200	1.00	4,000.00
6	35,000.00	SQFT	0060 ELECTRONIC CUTTABLE FILM ELECTROCUT FILM - E.C. FILM SERIES 1170, OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE.		
			COLOR SERIES: CLEAR 1170 YELLOW 1171 RED 1172 ORANGE 1174 BLUE 1175 GREEN 1177 BLACK 1178 BROWN 1179 ALL OF THE ABOVE ELECTRONIC CUTTABLE FILM IS TO BE NON-PERFORATED FOR USE IN FRICTION FEED ELECTRONIC CUTTING DEVICES 3M SERIES 1170	1.25	43,750.00
7	250.00	SQFT	0070 CLEAR PROTECTIVE OVERLAY FILM, SERIES 1150 OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE		
			3M SERIES 1150	1.60	400.00
8	250.00	SQFT	0080 CLEAR PREMIUM PROTECTIVE OVERLAY FILM, SERIES 1160 OR APPROVED EQUAL WITH PRESSURE SENSITIVE ADHESIVE.		
			THE ABOVE CLEAR FILM WHEN APPLIES TO REFLECTIVE SHEETING ALLOWS REMOVAL OF	2.35	587.50

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00116411

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
9	10,000.00	SQFT	<p>GRAFITTI FROM SIGN SURFACES</p> <p>3M SERIES 1160</p> <p>0090 CLEAR TRANSFER TAPE, SERIES TPM-5 OR APPROVED EQUAL FOR USE WITH ELECTROCUT FILM SERIES 1170</p> <p>THE ABOVE TRANSFER TAPE IS USED FOR PURPOSES OF PRESPACING AND TRANSFERRING ELECTRONIC CUTTABLE FILM</p> <p>3M TPM-5</p>	<p>1.00</p>	<p>10,000</p>

PROTECTION SERVICES INC.

UNANIMOUS WRITTEN CONSENT OF THE BOARD OF DIRECTORS

APRIL 12, 2013

THE UNDERSIGNED, being all of the members of the board of directors (the "Board") of Protection Services Inc., a Pennsylvania corporation (the "Company"), pursuant to Section 1727(b) of the Business Corporation Law of the Commonwealth of Pennsylvania (the "BCL"), hereby authorize, approve and consent to the adoption of the following resolutions with the same force and effect as if adopted at a duly called special meeting of the Board at which a quorum was present and acting throughout, and direct that they be filed with the minutes of the proceedings of the Board.

I. GRANTING OF SIGNING AUTHORITY

WHEREAS, the Board desires to delegate certain powers relating to negotiating, entering into, signing and authorizing of any agreements and contracts in the name of and on behalf of the Company;

NOW, THEREFORE, BE IT RESOLVED, that Douglas A Miceli may negotiate, enter into, sign and authorize any agreements and contracts in the name and on behalf of the Company, including, but not limited to, any contracts relating to the normal and regular operation of the Company, any agreements for the sale, purchase or supply of goods or services, any commercial contracts, or any leasing contracts.

II. GENERAL

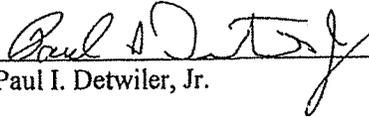
RESOLVED, that any one of the officers of the Company (each, an "Authorized Officer") be, and each hereby is, authorized, directed and empowered to take all actions and to execute, deliver and file, in the name and on behalf of the Company, under its corporate seal or otherwise, all agreements, instruments and other documents, and to pay any and all fees and expenses in connection therewith, as any of the Authorized Officers considers necessary or advisable to consummate the transactions contemplated hereby, including, without limitation, the payment of legal and accounting fees, such determination to be conclusively evidenced by the performance of such acts, the execution, delivery, or filing of such agreements, instruments, certificates and other documents, and the payment of any such fees and expenses by the Authorized Officers; and be it

FURTHER RESOLVED, that any and all actions taken by any Authorized Officer on behalf of the Company prior to the date hereof that are consistent with the intent and purposes of the foregoing resolutions be, and they hereby are, adopted, ratified, confirmed and approved in all respects as the acts and deeds of the Company; and be it

FURTHER RESOLVED, that this Unanimous Written Consent of the Board of Directors may be executed either by manual signature or a facsimile version of a manual signature and shall be filed with the minutes of the meetings of the Board and shall be treated for all purposes as action taken at a meeting of the Board.

[Signatures appear on following page]

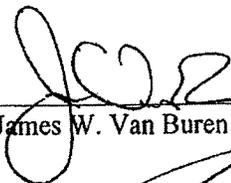
IN WITNESS WHEREOF, the undersigned have executed this Unanimous Written Consent of the Board of Directors effective on the date first written above.



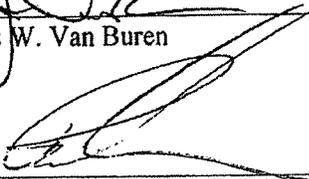
Paul I. Detwiler, Jr.



Donald L. Detwiler



James W. Van Buren



Paul I. Detwiler, III

Steven B. Detwiler

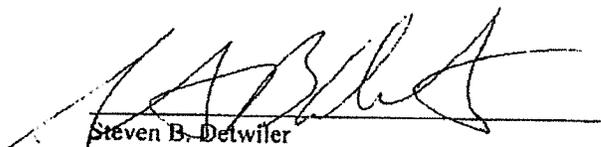
IN WITNESS WHEREOF, the undersigned have executed this Unanimous Written Consent of the Board of Directors effective on the date first written above.

Paul I. Detwiler, Jr.

Donald L. Detwiler

James W. Van Buren

Paul I. Detwiler, III



Steven B. Detwiler

Non-Public Works Bid

AFFIDAVIT

STATE OF Pa.

PARISH/COUNTY OF Cumberland

BEFORE ME, the undersigned authority, personally came and appeared: Douglas Micele, (Affiant) who after being by me duly sworn, deposed and said that he/she is the fully authorized signatory of Protection Services Inc. (Entity), the party who submitted a bid in response to Bid Number 50-116411, to the Parish of Jefferson.

Affiant further said:

Campaign Contribution Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A _____ Attached hereto is a list of all campaign contributions, including the date and amount of each contribution, made to current or former elected officials of the Parish of Jefferson by Entity, Affiant, and/or officers, directors and owners, including employees, owning 25% or more of the Entity during the two-year period immediately preceding the date of this affidavit or the current term of the elected official, whichever is greater. Further, Entity, Affiant, and/or Entity Owners have not made any contributions to or in support of current or former members of the Jefferson Parish Council or the Jefferson Parish President through or in the name of another person or legal entity, either directly or indirectly.

Choice B X there are **NO** campaign contributions made which would require disclosure under Choice A of this section.

Debt Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A _____ Attached hereto is a list of all debts owed by the affiant to any elected or appointed official of the Parish of Jefferson, and any and all debts owed by any elected or appointed official of the Parish to the Affiant.

Choice B There are **NO** debts which would require disclosure under Choice A of this section.

Affiant further said:

That Affiant has employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for Affiant; and

[The remainder of this page is intentionally left blank.]

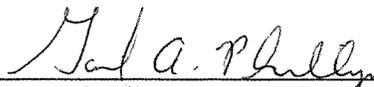
That no part of the contract price received by Affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for Affiant.


Signature of Affiant

Douglas Miceli

Printed Name of Affiant

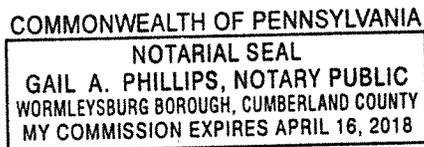
SWORN AND SUBSCRIBED TO BEFORE ME
ON THE 9 DAY OF May, 2016.


Notary Public Gail Phillips

Gail A. Phillips
Printed Name of Notary

1188694
Notary/Bar Roll Number

My commission expires 4/16/2018.



INSURANCE REQUIREMENTS - BIDS

All insurance requirements shall conform to Jefferson Parish Resolution No. 113646 or No. 113647. The contractor shall not commence work under this contract until he has obtained all insurance and complied with the requirements of the specifications and said Parish Resolutions. Except as otherwise provided by law, the Parish Attorney's Office with the concurrence of the Director of Risk Management is authorized to omit in whole or part the insurance requirements of this section in connection with contracts. Vendors inquiring about this shall submit his written request to the Purchasing Department prior to the due date of the bid. Contractor must deliver and maintain such insurances as provided; failure to do so shall be grounds for suspension, discontinuation or termination of the contract.

Successful bidder will be required to procure standard insurance policies evidencing Parish mandated insurance requirements indicated below. The current certificate of insurance must be submitted by low bidder within 10 days after bid opening to the Purchasing Department. Failure to comply will cause bid to be rejected.

1. WORKER'S COMPENSATION INSURANCE

As required by Louisiana State Statute, exception; Employer's Liability, Section B shall be \$1,000,000 per occurrence when Work is to be over water and involves maritime exposures to cover all employees not covered under the State Worker's Compensation Act, otherwise this limit shall be no less than \$500,000 per occurrence.

2. COMMERCIAL GENERAL LIABILITY

Shall provide limits not less than the following: \$1,000,000.00 Combined Single Limit per Occurrence for bodily injury and property damage.

3. COMPREHENSIVE AUTOMOBILE LIABILITY

Bodily injury liability \$1,000,000.00 each person; \$1,000,000.00 each occurrence.
Property Damage Liability \$1,000,000.00 each occurrence.

DEDUCTIBLES

No insurance required shall include a deductible not greater than \$10,000.00. The cost of the deductible shall be borne by the contractor.

NOTE: If the vendor requires a change in deductibles, the request must be submitted in writing to the Purchasing Department prior to the due date of the bid. Such request shall be reviewed by the Parish Attorney's Office.

UMBRELLA LIABILITY COVERAGE

An umbrella policy or excess may be used to meet minimum requirements.

CONSTRUCTION AND RENOVATION PROJECTS:

Unless otherwise specified in the bid, these additional insurance is required. Such insurance is due upon contract execution.

OWNER'S PROTECTIVE LIABILITY

To be for the same limits of liability for bodily injury and property damage liability established for commercial general liability.

BUILDER'S RISK INSURANCE

The contractor shall maintain Builder's Risk Insurance at his own expense to insure both the owner (Parish of Jefferson) and contractor as their interest may appear.

NOTE for CERTIFICATE HOLDER:

All insurance certificates shall list the certificate holder as follows:

"The Parish of Jefferson, its Districts, Departments and Agencies under the direction of the Parish President and the Parish Council." Additionally, the address on the Certificates should reflect the department which is letting the bid and reference the respective bid number.

Revised 2.10.2014



JEFFERSON PARISH

Department of Purchasing

Michael S. Yenni
Parish President

Brenda J. Campos
Director

May 4, 2016

ADDENDUM # 1

Bid No.: 50-00116411

Bid Opening Date: 05/12/2016
Extended Date:

For: Two year contract for reflective sheeting for Dept. of Engineering.

Answering questions:

1. For the sheeting, in general, will the width be 48" wide? Yes, 48" wide.
2. Item #3
3M Series 444/446 Orange/White Striped Sheeting. Should the quantity of 500 sq ft be linear feet? What sheeting width is needed, 6", 8", or 12"? Yes the rolls should be linear ft. 8" width.
3. Item #4
3M 3910 White and 3M 3914 Orange. Should the quantity of 750 sq ft be linear feet? Not available in 8" – comes in "20 Inch, 36 Inch, 4 Inch, 48 Inch, 6 Inch" widths Change to 4" and 6"? Yes the sheeting is linear ft. The width should be 6.

Replace page six (6) and seven (7) with revised Addendum # 1 sheets.

Sincerely,

Donna Reamey

Donna Reamey, Buyer II
Jefferson Parish Purchasing Department

[Handwritten signature]
5/4/16

Bidders must acknowledge all addenda on the bid form. Bidder acknowledges receipt of this addendum on the bid form as indicated. Failure to do so will result in bid rejection.

This addendum is a part of the contract documents and modifies the original bidding documents and specifications. The contents of this addendum shall be included in the contract documents. Changes made by this addendum shall take precedence over the documents of earlier date.

Jefferson Parish Department of Engineering
Traffic Engineering Division

Two-Year contract for a supply of Reflective Sheeting for the Jefferson Parish Department of Engineering, Traffic Engineering Division

Items included in this contract and technical specifications to follow:

1. Super-high efficiency, full cube prismatic reflective sheeting, series 4000
2. Enclosed lens reflective sheeting, series 3270 – engineer grade
3. Cement adhesive for traffic control
4. Electronic cuttable film, series 1170
5. Clear protective overlay film, series 1150
6. Clear premium protective overlay film, series 1160
7. Clear transfer tape, series tpm-5

Contract terms:

These specifications are prepared for a two (2) year contract for a supply of reflective sheeting for Jefferson Parish Traffic Engineering Division, East and West Banks, for marking and striping of Jefferson Parish roadways.

Warranty:

Products shall be warranted that they are manufactured in accordance with the applicable material specifications and are free from defects in workmanship and materials. Any defective items sold under this contract shall be replaced at no cost to the purchaser.

General specifications:

This specification designates the general requirements for a supply of reflective sheeting for Jefferson Parish Traffic Engineering Division East and West Banks for marking and striping of Jefferson Parish roadways. Jefferson Parish reserves the right to purchase any quantity of units more or less than specified and/or as needed during the two (2) year period of the contract.

Material deliveries for bidding purposes, bid prices shall reflect no minimum delivery quantity.

The bidder is not to pre-ship any quantity until authorized by purchase order.

The quantities shown on the proposal guide are approximate quantities to be acquired by Jefferson Parish over a two (2) year period. Actual usage will be on an "as needed" basis.

All pertinent technical specifications and literature must be included in the bid.

Successful bidder will be allowed 30 days, from the date of contract execution, to stock and maintain sufficient quantities of material on hand to meet the needs of Jefferson Parish. Vendor will ship requested quantities (as indicated on purchase order) within seven (7) calendar days.

Bid delivery shall include all freight and delivery costs to Jefferson Parish.

Samples may be required for comparable evaluation. Bidders must honor such requests and, if required, submit within five (5) working days. Failure to honor such request will result in the bid being considered non-responsive.

JEFFERSON PARISH DEPARTMENT OF ENGINEERING
TRAFFIC ENGINEERING DIVISION
REFLECTIVE SHEETING SPECIFICATIONS

Two-Year contract for a supply of Reflective Sheeting for the Jefferson Parish Department of Engineering, Traffic Engineering Division

SUPER-HIGH EFFICIENCY, FULL CUBE PRISMATIC REFLECTIVE SHEETING (DIAMOND GRADE)

Note: The following Specification contains both warranty and pre-qualification clauses directly related to product performance.

Scope

This specification covers flexible, white or colored, Super-High Efficiency retro-reflective sheeting, tape and related processing materials designed to enhance the day/night visibility of traffic control signs and objects. (3M Series 4000, or approved equal).

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards.

ASTM D 4956-05 Standard Specification for Retro-reflective Sheeting for Traffic Control (Table 17 Color Requirements) and (Tables 10 and 14 for Luminance factors).

D 523 Standard Method for Test for Specular Gloss.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the Colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflection of retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

B209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

Description

The retroreflective sheeting shall have a smooth surface and shall be pre-coated with a pressure sensitive adhesive backing protected by a removable liner.

As per FHWA-SA-07-020, Jefferson Parish utilizes the "Comparison Panel" Assessment Method and Management Method "3" for assessment and management of sheeting retroreflectivity. These assessment methods compare the useful life of the sheeting to the warranty period for the sheeting. Unless otherwise specified herein, all applied and unapplied test samples and specimens shall be

conditioned at the standard conditions of 73 +/- 3 degrees F (23 +/- 3 degrees C) and 50 +/- 5% humidity for 24 hours prior to testing.

Control Sample Test Panels

Unless otherwise specified herein, when tests are to be performed using test panels, the specimens of retroreflective material shall be applied to smooth aluminum cut from ASTM B-209 Alloy 5052-H36, 5052-H38, 5154-H38 or 6061-T6 sheets in 0.020 inch (0.051 cm), 0.040 (0.102 cm) or 0.063 (0.160 cm) thickness. The aluminum shall be degreased and lightly acid etched before the specimens are applied. The specimens shall be applied to the panels in accordance with the recommendations of the retroreflective sheeting manufacturer.

Control Sample Test Panel Performance

In keeping with the afore mentioned assessment method, the manufacturer supplying materials specified herein must supply control samples of these materials in each color for installation on test panels located at the Jefferson Parish Sign and Signal Shop, 2100 Dickory Avenue. Harahan, LA. These materials must be mounted and exposed to continuous weather conditions for three years prior to bid opening. It is the responsibility of the manufacturer to insure that mounting has been accomplished. Successful performance of the product sample must be demonstrated continuously for a minimum of three years in this control sample or actual field performance in Jefferson Parish or other similar municipality in order for the product to be qualified as meeting these specifications. Jefferson Parish will compare the control sample to a new sample after the test period to ensure endurance of retroreflectivity requirements. In lieu of three year control sample exposure, materials (sheeting, process colors, overlay films) shall be approved for use, when, in the opinion of this agency, sufficient evidence and certification of use in other municipalities having similar environmental conditions from the manufacturer exists to ensure that the materials and services offered can reliably conform to this specification and warranty period.

Successful performance shall include, but not be limited to continuous adhesion and lamination, shrinkage or distortion, retained color, chromatic quality and reflectivity. Failure to comply with this section of these specifications shall require disqualification and rejection of the manufacturer's product for the bid.

TABLE I:

No single test sample as per ASTM E810 shall be less than 80% of the values indicated in Table I.

Coefficient of Retroreflection, RA

The coefficients of Retroreflection shall not be less than the minimum values specified in Table I.

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for corresponding color in Table I.

Units

Coefficients of retroreflection RA shall be specified in units of candelas per footcandle per square foot (candelas per lux per square meter).

The observation angles shall be 0.2, 0.5 and 1.0 degrees.

Values at 0 and 90 degrees orientation shall be averaged.

Minimum Coefficient of Retroreflection R_A
(Candelas per lux per square meter)

Table I
Minimum Coefficient of Retroreflection
(cd/lux/m²)

White	-4	30
0.2	570	215
0.5	400	150
1.0	120	45

Blue	-4	30
0.2	26	10
0.5	18	6.8
1.0	5.4	2.0

Yellow	-4	30
0.2	425	160
0.5	300	112
1.0	90	34

FYG	-4	30
0.2	455	170
0.5	320	120
1.0	96	36

Red	-4	30
0.2	114	43
0.5	80	30
1.0	24	9

FY	-4	30
0.2	340	130
0.5	240	90
1.0	72	27

Green	-4	30
0.2	57	21
0.5	40	15
1.0	12	4.5

FO	-4	30
0.2	200	75
0.5	140	52
1.0	42	16

Gloss Retention

The retroreflective sheeting shall have an 85 degree specular gloss of not less than 50 when tested in accordance with ASTM D-523.

Adhesive

The protective liner attached to the adhesive shall be easily removed by peeling without soaking in water or other solutions, without breaking, tearing, or removing any adhesive from the backing.

Impact Resistance

The retroreflective sheeting shall comply with the impact resistance requirements contained in ASTM D 4956-05, section 6.10.

Resistance to Accelerated Outdoor Weathering

The Retro-reflective surface of the sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after 3 years unprotected outdoor exposure. The coefficient of retroreflection shall not be less than 80% of the values in Table I and the colors shall conform to the requirements of ASTM D 4956, table 17.

The sheeting shall show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more than 1/32 inch (0.08 cm) shrinkage or expansion.

Resistance to Heat

The retroreflective sheeting shall retain coefficients of retroreflection between 85% and 115% of the values measured before exposure.

General Characteristics and Packaging

The retroreflective sheeting as supplied shall be of good appearance, free from ragged edges, cracks and extraneous materials, and shall be furnished in either rolls or sheets. When furnished in continuous rolls, the average number of splices shall not be more than 3 per 50 yards (45.7 m) of material with a maximum of 4 pieces in any 50 yard (45.7 m) length. Splices shall be butted or overlapped and shall be suitable for continuous application as furnished. When furnished as cut sheets or sign faces, the sheeting shall be packaged flat in accordance with commercially accepted standards. The sheeting shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Each carton shall clearly stipulate the brand, quantity, size, lot or run number and color. Stored under normal conditions the retroreflective sheeting as furnished shall be suitable for use for a minimum period of one (1) year. Rolls and sheets are determined by requisition.

Performance Requirements and Obligations.

Certification

The sheeting manufacturer shall submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed herein.

Warranty for Ordinary Colors:

Sheeting manufactured of standard colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations, shall perform effectively for a period of ten (10) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to

natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

The sheeting must retain 80% of values listed in Table I up to 7 years and 70% of values listed in Table I up to 12 years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of entire sign and shall be replaced under manufacturer's replacement obligations.

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for the corresponding integral color.

All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Warranty for Fluorescent Colors:

Sheeting manufactured of fluorescent colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations shall perform effectively for a period of ten (10) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

The sheeting shall retain 80% of values listed in Table I up to 5 years and 70% of values listed in Table I up to 7 years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of entire sign and shall be replaced under manufacturer's replacement obligations.

All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Warranty for Fluorescent Orange Colors

Sheeting manufactured of fluorescent orange and applied to sign blank material in accordance with the sheeting manufacturer's recommendations, is expected to perform effectively for a minimum of three (3) years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose or (2) retains less than 50% of the coefficient of retroreflection values listed in Table I at 0.2 degrees observation, -4 degrees entrance (measured in accordance with ASTM E810).

All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.

Natural causes include effects of exposure to weather. Natural causes exclude (without limitation) damage from exposure to chemicals, abrasion and other mechanical damage (such as from fasteners used to mount the sign, collisions or mishandling), vandalism, or malicious mischief.

Sheeting Manufacturer's Replacement Obligation

For standard colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory during:

For the entire ten (10) years, the sheeting manufacturer will replace the sheeting required to restore the sign surface to its original effectiveness.

In addition, during the first seven (7) years the sheeting manufacturer will cover the cost of restoration of the sign surface to its original effectiveness at no cost to agency for materials and labor. Replacement sheeting shall carry the unexpired warranty of the sheeting it replaces.

For fluorescent colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory:

If the failure occurs within the first five (5) years from the date of fabrication, the manufacturer will, at its expense, restore the sign surface to its original effectiveness.

If the failure occurs within the sixth (6th) or seventh (7th) year from the date of fabrication, the manufacturer will furnish the necessary amount of sheeting necessary to restore the sign surface to its original effectiveness.

Replacement sheeting shall carry the unexpired warranty of the sheeting it replaces.

For temporary signing, (fluorescent orange), where it can be shown that the retroreflective sheeting fails to conform to the performance requirements, the sheeting manufacturer's sole responsibility and purchaser's and user's exclusive remedy shall be:

Provide Replacement Sheeting

This sheeting shall carry the unexpired warranty of the sheeting it replaces.

Process Inks

The manufacturer of the sheeting shall manufacture and may offer at no additional cost the process inks, clears and thinners recommended for the sheeting to meet the performance requirements of this specification, and shall further be responsible for technical assistance in the use of these inks in accordance with Section 8.

Slip Sheet

Slip Sheet paper, if recommended by the sheeting manufacturer for sheeting surface protection or for use in packing, storage or shipping finished signs, may furnish in rolls by the manufacturer, at no additional charge, in at least equal square footage and in the same widths as the sheeting supplied.

Washers

Washers, if recommended by the sheeting manufacturer to protect the sign surface from damage by bolts or other fasteners, may be furnished by the manufacturer at no additional charge or a nominal charge.

Technical Assistance Requirements

Instruction and Training

The manufacturer supplying the sheeting shall provide the services of a qualified technician for instruction and training at the Jefferson Parish Traffic Engineering Sign Shop (2100 Dickory Avenue, Harahan, LA). This instruction shall be available on a quarterly basis at no additional cost, and shall include but not be limited to, training videos, material application, equipment operation, silk screening techniques, packaging, storage and other proven sign shop practices as they apply to the reflective sheeting supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications.

Compliance

Failure to comply with the requirements of these specifications shall be cause for cancellation of annual contract if applicable. ***Jefferson Parish requires sign dating of all signs at the time of application. That date constitutes the start of field performance obligation period.***

Patented Devices, Materials and Processes

Seller will pay any damages, costs or fines resulting from any claims against Jefferson Parish for infringement or alleged infringement of third party patents by product supplied by Seller under this specification. The costs paid by Seller shall include legal and court costs deemed reasonably necessary by counsel for Jefferson Parish in defending against such claims.

ENCLOSED LENS REFLECTIVE SHEETING

Note: The following Specification contains both warranty and pre-qualification clauses directly related to product performance.

DESCRIPTION

The reflective sheeting shall consist of spherical lens elements embedded within a transparent plastic having a smooth, flat outer surface. The sheeting shall be weather resistant and have a protected pre-coated adhesive backing. (3M Series 3200, or approved equal)

REQUIREMENTS

Photometric

Background- The reflective sheeting shall have the following coefficients of retroreflection expressed as the average of representative readings over the entire surface of a panel. Measurements shall be conducted in accordance with ASTM E810 "Standard Test Method for coefficient of Retroreflection of Retroreflective Sheeting."

	White		Yellow		Red	
Div. Ang.	.2 deg.	.5 deg.	.2 deg.	.5 deg.	.2 deg.	.5 deg.
Inc. Ang.						
-4 deg.	70.0	30	50	25	14.5	7.5
30 deg.	30	15	22	13	6	3
	Blue			Green		
Div. Ang.	.2 deg.	.5 deg.		.2 deg.	.5 deg.	
Inc. Ang.						
-4 deg.	4.0	2		9	4.5	
30 deg.	1.7	0.8		3.5	2.2	
	Orange			Brown		
Div. Ang.	.2 deg.	.5 deg.		.2 deg.	.5 deg.	
Inc. Ang.						
-4 deg.	25.0	13.5		2	1	
30 deg.	7	4		1	0.5	

Applied or Demountable Copy

Reflective Sheeting for all sign copy including letters, numerals, symbols, borders, and route markers shall be White which has been carefully selected by the manufacturer for uniformity of day and night appearance. No further matching shall be necessary.

Rainfall Performance

The brightness of the reflective sheeting, totally wet by rain, shall not be less than 90% of the above values. Wet performance measurements shall be conducted in conformance with Standard RAINFALL TEST specified in Federal Specification L-S-300C "Sheeting and Tape, Reflective, Non-exposed Lens Adhesive Backing."

Color

Color shall be as specified and shall conform to ASTM D 4956-05, Table 5. Luminance factors shall conform to ASTM D 4956-05, Table 6.

Adhesive

The reflective sheeting shall include a pre-coated pressure adhesive which may be applied without necessity of additional adhesive coats on the reflective sheeting or application surface.

The protective liner attached to the adhesive shall be easily removed by peeling without soaking in water or other solvents.

The adhesive coated sheeting, when applied at 72 deg. F (22 deg. C) and conditioned for 24 hours at this temperature, shall form a durable bond to clean, smooth, corrosion and weather resistant substrates when exposed to temperatures of -30 deg. to 160 deg. F. (-35 deg. to 72 deg. C).

Film

The reflective sheeting shall have sufficient strength and flexibility so that it can be handled, processed, and applied according to the recommendations of the sheeting manufacturer without appreciable stretching, tearing, or other damage. It shall permit application over and conformance to moderate, shallow embossing characteristics of certain sign borders and symbols. Following liner removal, the reflective sheeting shall not shrink more than 1/32" (0.79 mm) in 10 minutes nor more than 1/8" (3.18 mm) in 24 hours in any dimension per 9.0" (22.9 cm) square at 72 deg. F. (22 deg. C) and 50% RH.

The sheeting with the liner removed and conditioned for 24 hours at 72 deg. F (22 deg. C) and 50% RH, shall be sufficiently flexible to show no cracking when slowly bent, in one second's time.

Surface

The sheeting surface shall be smooth and flat, and facilitate cleaning and wet performance. The sheeting surface shall be readily processed and compatible with recommended transparent and opaque process colors and show no loss of the color coat with normal handling, cutting, and application.

The sheeting shall permit cutting and color processing at temperatures of 60-100 deg. F. (15 deg. - 28 deg. C) and relative humidity's of 20-80%. The sheeting shall be heat-resistant and permit force curing without staining of unapplied sheeting at temperatures up to 150 deg. F (65 deg. C) and up to 200 deg. F (93 deg. C) on applied sheeting.

Effective Performance Life and Warranty

Reflective sheeting processed, applied to approved sign base materials, and cleaned, in accordance with manufacturer's recommendations for their use on traffic control signs, shall be considered as performing effectively for a field life of seven (7) years if the sheeting has not deteriorated due to natural causes to the extent that: 1) the sign is ineffective for its intended purpose when viewed from a vehicle, or 2) the average night time reflective brightness is less than that specified in Table II below. The vendor shall be replace all reflective sheeting failing to give satisfactory performance for the seven (7) year field service.

TABLE II - EFFECTIVE PERFORMANCE LIFE
Average Specific Intensity per Square Foot
(Candlepower/FootCandle/Square Foot divergence) and -4 deg. incidence*

Sheeting Type & Color	7 yrs. Field Service	Performance Life**
White	35	7 Years
Yellow	20	7 Years
Red	5	7 Years
Blue	2	7 Years
Green	3	7 Years
Orange	10	7 Years

*Candlepower measurement shall be made, following sign cleaning, in accordance with procedure recommended in Section IIA.

**Performance years for each color shall be stated by the bidder.

The reflective material exposed in the Jefferson Parish control sample for 36 months (2100 Dickory Avenue, Harahan, LA), shall not support fungus growth and accumulate dirt to the extent that the reflective brightness before cleaning is less than 75% of the reflective brightness after cleaning.

The sheeting surface may be readily refurbished by cleaning and clear overcoating in accordance with the manufacturer's recommendations.

General Characteristics and Packaging

The reflective sheeting as supplied shall be of good appearance, free from ragged edges, cracks, and extraneous materials, and shall be furnished in both rolls and sheets. When the reflective sheeting is furnished in continuous rolls, the average number of splices shall not be more than three per 50 yards of material with a maximum of four splices in any 50-yard length. Splices shall be butted or overlapped and shall be suitable for continuous application as supplied.

Sheeting shall be packaged in accordance with commercially accepted standards.

Stored under normal conditions, the reflective sheeting as supplied shall be suitable for use for a period of at least one year.

NOTE: Metric equivalents in parenthesis.

Equipment, Delivery, Service

The manufacturer supplying the retroreflective sheeting shall provide service for recommended sheeting application equipment and certify that trained personnel will be available within 24 hours notice to render such service.

The manufacturer must supply materials in all widths and colors specified. No partial bids will be accepted.

Control Sample Test Panel Performance

In keeping with the assessment method stated on page 1 of these specifications, the manufacturer supplying materials specified herein must supply control samples of these materials in each color for installation on test panels located at the Jefferson Parish Sign and Signal Shop, 2100 Dickory Avenue. Harahan, LA. These materials must be mounted and exposed to continuous weather conditions for three years prior to bid opening. It is the responsibility of the manufacturer to insure that mounting has been accomplished. Successful performance of the product sample must be demonstrated continuously for a minimum of three years in this control sample or actual field performance in Jefferson Parish or other similar municipality in order for the product to be qualified as meeting these specifications. Jefferson Parish will compare the control sample to a new sample after the test period to ensure endurance of retroreflectivity requirements. In lieu of three year control sample exposure, materials (sheeting, process colors, overlay films) shall be approved for use, when, in the opinion of this agency, sufficient evidence and certification of use in other municipalities having similar environmental conditions from the manufacturer exists to ensure that the materials and services offered can reliably conform to this specification and warranty period.

Successful performance shall also include, but not be limited to continuous adhesion and lamination, shrinkage or distortion, retained color, chromatic quality and reflectivity. Failure to comply with this section of these specifications shall require dis-qualification and rejection of the manufacturer's product for the bid.

ELECTRONICALLY CUTTABLE COLOR FILMS FOR USE ON RETROREFLECTIVE SHEETING

Note: The following specification contains warranty clauses directly related to product performance.

Scope

This document covers flexible, transparent, durable films designed to be applied to retroreflective materials for the creation of traffic control signs and devices. (3M Series 1170, or approved equal).

Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

ASTM Standards

B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.

D 523 Standard Method for Test for Specular Gloss.

D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

E 284 Standard Definition of Terms Relating to Appearance of Materials.

E 308 Computing the colors of Objects by Using the CIE System.

E 810 Standard Test Method for Coefficient of Retroreflective of Retroreflective Sheeting.

E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

Description

Electronic cuttable films shall consist of durable, transparent, colored films coated with a transparent pressure sensitive adhesive protected by a removable liner. The films are designed to be cut on knife over roll (sprocket fed or friction fed) and flatbed electronic cutting machines. The films shall be available in standard traffic colors, be dimensionally stable, and be designed to optimally cut, weed, lift, and transfer. Use of electronic cuttable films will not require Jefferson Parish Traffic Engineering Sign Shop to release any volatile organic compounds.

Coefficient of Retroreflection, Ra.

When electronic cuttable film is applied to retroreflective sheeting, the composite will conform to the percentage retained of the minimum coefficient of retroreflection specified by Jefferson Parish Traffic Engineering and the manufacturer for the retroreflective sheeting when the retroreflective sheeting is screen processed. The coefficient of retroreflection shall be determined in accordance with ASTM E 810.

Units

Coefficients of retroreflection Ra shall be specified in units of candelas per foot candle per square foot (candelas per lux per square meter).

Retroreflective sheeting with datum marks shall be tested in the orientation specified by the manufacturer. If no datum mark is supplied, the sheeting shall be rotated to determine the minimum Ra which shall be reported without averaging.

Specular Gloss

The electronic cuttable film shall have an 85 degrees specular gloss of not less than 50 when tested in accordance with ASTM D 523.

Processing and Cuttability

The electronic cuttable film shall permit cutting, weeding, masking with transfer tape, lifting, and application to retroreflective sheeting when used in accordance with manufacturer's recommendations at temperatures between 65 degrees and 95 degrees F (18.3 degrees and 35.0 degrees C) and relative humidity between 30% and 70%. The film shall lay flat with minimal edge curl and be dimensionally stable.

Adhesive Liner

The protective liner attached to the adhesive shall be easily removable by peeling without soaking in water or other solutions, without breaking, tearing, or removing any adhesive from the electronic cuttable film. The liner shall have a controlled release from the adhesive coated film sufficient to allow cutting without the film popping off from the liner while still allowing the liner to easily be peeled from the film.

Resistance to Accelerated Outdoor Weathering

When electronic cuttable film is applied to retroreflective sheeting, the surface of the film shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after two (2) years unprotected outdoor exposure. The coefficient of retroreflection shall not be less than the value specified in Table I for the High Intensity Prismatic Reflective Sheeting (page 8 of these specifications) when the retroreflective sheeting is screen processed.

The film shall show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more that 1/32 inch (0.08cm) shrinkage or expansion.

The film shall show acceptable colorfastness.

Retained reflectivity shall be the same as Jefferson Parish's specification for screen processed retroreflective sheeting of the type being tested.

The electronic cuttable film shall not be removable from the retroreflective sheeting without damage.

Where more than one panel of a color is measured, the coefficient of retroreflection shall be the average of all determinations.

Colorfastness

After the specified outdoor weathering, the sheeting shall conform to the color requirements in ASTM D 4956-05 Tables 5 and 6.