

Design of Markings Featuring 3M™ Films and Sheatings

Colour Matching

Colour Matching 3M™ Scotchcal™ and 3M™ Controltac™ Films

Films do not generally require matching.

Certain applications which require identical colour matches, such as butted stripping, letters or emblems fabricated from multiple pieces may require additional precautions in matching to prevent problems. Use material from a single roll or lot to maximise colour uniformity. Next follow the special matching instructions for individual products as referenced in this bulletin.

Colour Matching 3M Scotchlite Reflective Sheeting

Whenever two or more pieces of Scotchlite Sheeting are used together on a single marking as a set, they must be matched to assure uniform day colour and night reflective appearance. Sheeting should also be matched for colour and reflective brilliance at splices within the rolls.

Multiple section Four Colour Graphics should be fabricated using Scotchlite 680CM-10 or 690CM-10 colour matched sheeting. Refer to Product Bulletin 4400 4C or Instruction Bulletin 3.9 for details.



CAUTION: Close colour matching of large multi-sheet graphics is difficult on retroreflective materials due to production lot variability for both day and night colour and processing variabilities when using transparent process inks.

Reflective materials from identical production lots must be checked for both day and night-time appearance where adjoining panels are needed.

Recommendations in this bulletin must be followed to minimise effects of within-lot and crossweb variations.

General Procedure

1. All sheets must be matched for day colour and night reflective appearance. Use a reflector spot lamp held directly in front of the face and view the sheeting at a distance of at least 50 feet. Be sure that the sheeting is at nearly right angles to the light source. However, do not position the sheeting exactly perpendicular to the light source, as specular glare from the sheeting surface may result in errors in matching.
2. After sheets have been matched, be sure that they are not mixed during application. If one sheet of a set is ruined, match a new sheet for day colour and night reflective appearance. It may be economical to set aside all damaged sets and match the good sheets into complete sets at the end of the run. If the signs are to be clear coated, the odd sets should be clear coated before matching.
3. In general, translucent films and reflective sheeting from a roll can be matched as shown in Figure 1. The dark line represents one edge of the film or sheeting.

Notice that the matching edges are always swung to meet each other. Panels 1 and 2 are a matched set. Pieces 1, 2, and 3 are matched, etc. By following this method you can match as many sheets from a roll as are required for any size sign.

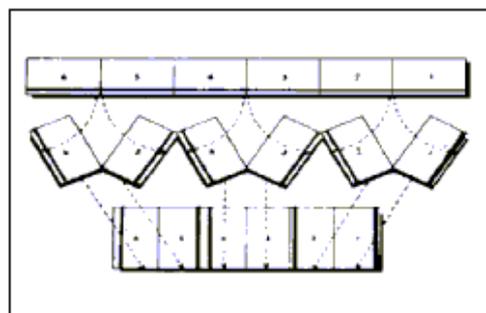


Figure 1

Contact your 3M Technical Service Representative for information and assistance.

The following additional precautions in matching should be followed when using the specific products listed below:

Series 3480, 210 and 7725 SE Fluorescent Films

To assure uniform appearance for the entire performance life, it is recommended that only material from a single roll or run be used on a single marking or sign, particularly where splicing is required.

Metallic Films From Series 180, 220, 3650, 7725 and 7755; and 210-314 and 7725-314 Dusted Crystal Films

These films have flakes which orient themselves during manufacture. This orientation causes the film to appear lighter or darker in colour depending on the viewing angle. To prevent this problem, multiple piece markings must be fabricated such that the printing on the liner is in the same direction for each piece.

Series 3630 and 230 Translucent Films; Series 220 and 7725 SE Frosted Crystal Films; and All Reflective Sheetings

Whenever two or more pieces of the same colour translucent film, frosted crystal film or reflective sheetings are seamed together as a continuous band of colour they should be matched to assure uniform daytime colour. Uniform night-time appearance must also be matched for translucent films and translucent sheetings.

Material from a single roll or lot must be used on a single marking or sign for identical colour matching.

Layout

Scotchlite Reflective Sheeting

In designing reflective graphics, the night-time appearance of the marking must determine the layout. This approach to layout will result in consistent flow of thought and similarity of design, in both day and night views.

Totally Reflectorized Markings

Large areas of colour present the greatest target value at long range.

This type of marking is designed by following these rules:

1. For letters and major copy use white or gold colour Scotchlite Reflective Sheeting.
2. Use darker colours for the background - blue, green, or red. Because the background will be reflective, it must provide the contrast necessary to make the copy highly legible.

3. Outline the design with a border of white or gold colour. A border will tie all of the units together, will give dimension and will add size to the marking.

The result is a colourful easy to see graphic that attracts attention at long range, 24 hours a day.

Partially Reflectorized Markings

The layout approach is the same as above. Make the copy and design legible and effective at night. The daytime appearance will take care of itself.

General Rules and Hints (see figure 2)

Spotlight Important Areas

To emphasise primary copy, use colours of high reflective brilliance. Colours with similar reflective brilliance compete for viewer attention. Therefore, if a heading or trademark is to be featured, the rest of the layout should not contain colours of equal or greater brilliance.

Use Simple Copy

For legibility the copy should be kept as large as possible and should be restricted to one or two colours. This prevents colour clashing and blurring and allows for maximum readability. A Gothic style letter such as Helvetica Medium or similar will always be a good choice for readability, both daytime and night-time.

Different Colour in Each Plane

For sharp colour definition and to increase the illusion of three (3) dimensions, use a different colour in each plane.

Use Opaque Colours for Contrast

Contrast and emphasis can be obtained by using opaque colours. These can be black or coloured inks.

Use opaque ink borders or shading around letter for maximum readability. The combined width of the borders should not be less than one-third the stroke of the letter.



Figure 2

Also, use opaque colours to bring out detail in an illustration.

Colour Combinations

The following table will guide you in selecting the proper colour combinations. Colour combinations rated as poor should not be used. Those listed as fair should be used with care, depending upon the relative areas of the two colours. Whenever possible, select combinations rated as good. It is suggested that a layout be tested before using.

Reflective Copy	Background Colour				
	White	Yellow	Red	Gold Green Blue	Orange
White	NR	Poor	Fair	Good	Poor
Gold	Poor	NR	Fair	Good	Poor
Yellow					
Red	Good	Fair	NR	Poor	NR
Green, Blue	Good	Fair	Poor	NR	NR
Orange	Poor	NR	NR	NR	NR

1. Orange is possibly the most versatile colour. It is fairly strong daytime; very bright night-time. Also, deep screened colours, lightened with toner, can be brought toward the medium colour range. White Reflective Sheeting, when printed with Scotchlite 4400 or Scotchal Series 9700 UV Screen Printing Inks, is comparable in brilliance to the corresponding coloured sheeting.
2. Deep colours (blue, green, red) almost always require a white (light) reflective border or background for letters/stripes to strengthen their night-time legibility.
3. Letters/stripes of light colours (white, yellow, gold) need not have dark borders, except to enhance or improve daytime appearance.
4. Brown/black are poor in graphics and should be avoided because they lack "punch" at night. If it is necessary to use black or brown, they should have white (light) coloured borders for daytime contrast and target value at night. Remember that black sheeting reflects white at night.

How to Make a Miniature Marking

After completing your pencil layout, it is a good idea to make a reflectorized miniature. A true-scale miniature can be produced by screen printing with the inks to be used; or by using cut-outs of Scotchlite Reflective Sheeting; or by using 3M Colour-Key.* View the miniature with a flashlight in a dark room. Any obvious faults can be corrected at this stage. You will also find that a miniature is a useful sales tool.

*3M Company, St. Paul, Minnesota

Cut-Out Letters

For the most efficient use of sheeting, letters should be nested for cutting. Adjacent letters in the legend should be positioned as close together as possible. Cut all letters in a single legend from the same sheet, or from matched sheets.

Letter Spacing

Due to the high reflectivity of Scotchlite Reflective Sheeting, letters overglow (appear larger in size) when viewed at night. If the lettering or the lines of copy are too close together, blurring will result. Attention to the following simple rules will produce maximum readability under all conditions:

1. Lettering smaller than 12 inches of height requires open spacing of 1-1/2 to 2 strokes between "straights."
2. The spacing between two lines of copy should be a minimum of one-half the height of the tallest letters.
3. Secondary copy in light colours or orange under 4 inches becomes illegible.
4. Dark coloured letters under 9 inches should be avoided unless a light reflectorized background is used. When dark colours are used, the graphics must be large and bold or the background must be in a light reflectorized colour.
5. When designing graphics with a reflectorized sheeting it is advisable to develop a method of viewing the design under night-time condition to make sure the graphics are effective and legible.

Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

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Technical Assistance

For help on specific questions relating to 3M Commercial Graphics Division Products, contact your local Technical Service Representative.

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