Technical Datasheet

Product Description

REFLOMAX GLODIAN™ SG-8000 series is highly reflective, weatherproof, self-adhesive films with excellent corrosion and solvent resistance. The product was specifically developed for the manufacture of traffic sign, which are intended for long term vertical outdoor use.
REFLOMAXGLODIAN™ SG-8000 series is composed of a UV stabilized acrylic front film. Its retroreflective system consists of sealed cells of air backed microprisms, using total internal reflection. The distinct pattern and sealing identifies the machine direction and the manufacturer of the sheeting shown in Figure 1. The sheeting displays a watermark (general colors only) with the product code and service time in a repeat pattern to provide identification to users & visual verification of proper use by inspectors, shown in Figure2.
The product complies with the requirements of ASTM D 4956 Type 8, KS T 3507 Type 8, EN12899-1 Class RA2, GOST32945 Class 3, JIS Z 9117 Type 2-A-a & 2-A-b concerning microprismatic materials.

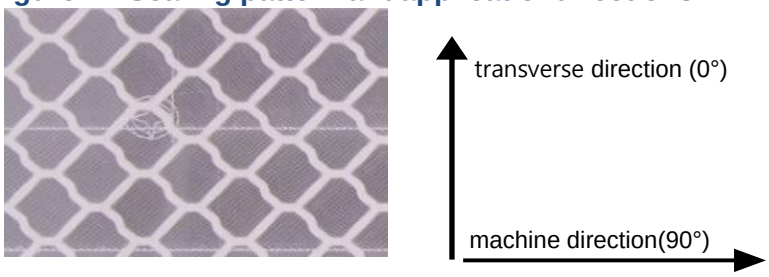
Retroreflectivity

REFLOMAX GLODIAN™ SG-8000 series exceeds the minimum performance requirements of ASTM D4956 Type Ⅷ. The required minimum retroreflection values, shown in tables 1, are complied with when measured in accordance with the corresponding specifications using CIE54:1982.

Color

REFLOMAX GLODIAN™ SG-8000 series is available in white (01), yellow (03), orange (05), red (07), green (09) and blue (11), as well as fluorescent yellow-green (02) and fluorescent orange (04). The sheeting conforms to the daytime color requirements in tables 2 and nighttime color requirements in tables 3and shall comply with the specifications of ASTM D4956.

Figure 1 - Sealing pattern andapplicationdirections



Adhesive

REFLOMAX GLODIAN™ SG-8000 series has a presure-sensitive adhesive that is recommended for room temperature application. Room temperature application is defined as 18°C~25°C(64°F~77°F).

Application/Processing

REFLOMAX GLODIAN™ SG-8000 series was especially developed for traffic sign applications. Substrate to which the material will be applied must be thoroughly clean. The substrate must be free of dust, oil, fats, silicon or other contamination.
REFLOMAX GLODIAN™ SG-8000 series is optimized for application onto flat substrates of aluminum alloys or galvanized steel. For other applications, the user is fully responsible for evaluating the suitability of the product, and for any risks associated with thatuse.

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Note

All REFLOMAX GLODIAN™products are manufactured within an ISO 9001:2015 controlled manufacturing environment.

Product Data

Retroreflectivity for new sheeting (cd/lx/m^2) as per ASTM D4956

Table 1 – Specific coefficient of retroreflection (ASTM D4956-17 Type VIII sheeting)						
Observation angle	**0.1°**		**0.2°**		**0.5°**	
Entrance angle	**-4°**	**30°**	**-4°**	**30°**	**-4°**	**30°**
white	1000	460	700	325	250	115
yellow	750	345	525	245	190	86
orange	375	175	265	120	94	43
red	150	69	105	49	38	17
green	100	46	70	33	25	12
blue	45	21	32	15	11	5
fl. yellow-green	800	370	560	260	200	92
fl. orange	300	135	210	95	75	35

Daytime color specification limits

Table 2 – Chromaticity coordinates (ASTM D495)									
Colors	**1**		**2**		**3**		**4**		**Luminance Factor (Y %)**
	x	**y**	**x**	**y**	**x**	**y**	**x**	**y**	
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 ≤ Y ≤ 45
orange	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404	10 ≤ Y ≤ 30
red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5 ≤ Y ≤ 15
green	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	3 ≤ Y ≤ 12
blue	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	1 ≤ Y ≤ 10
fl. yellow-green	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540	≥ 60
fl. orange	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355	≥ 20

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Nighttime color specification limits

Colors	1		2		3		4	
	x	y	x	y	x	y	x	y
white	0.475	0.452	0.360	0.415	0.392	0.370	0.515	0.409
yellow	0.513	0.487	0.500	0.470	0.545	0.425	0.572	0.425
orange	0.595	0.405	0.565	0.405	0.613	0.355	0.643	0.355
red	0.650	0.348	0.620	0.348	0.712	0.255	0.735	0.265
green	0.007	0.570	0.200	0.500	0.322	0.590	0.193	0.782
blue	0.033	0.370	0.180	0.370	0.230	0.240	0.091	0.133
fl. yellow-green	0.480	0.520	0.473	0.490	0.523	0.440	0.550	0.449
fl. orange	0.625	0.375	0.589	0.376	0.636	0.330	0.669	0.331

Application Instructions

Processing instructions

This application instruction is to explain proper ways to apply REFLOMAX GLODIAN™ SG-8000 series to traffic sign. Even though it is impossible to explain all aspects that need to be taken into account, this application instruction comprises a large number of useful tips for handling REFLOMAX GLODIAN™ SG-8000 series.

The sign producers who will use REFLOMAX GLODIAN™ SG-8000 series should follow this application instruction to produce their signs in right way for traffic sign according to the following standards : ASTM D 4956 Type 8, KS T 3507 Type 8, EN12899-1 Class RA2, GOST32945 Class 3, JIS Z 9117 Type 2-A-a & 2-A-b.
Also, specific knowledge and skills of sign produces are prerequisites for the processing of REFLOMAX GLODIAN™ SG-8000 series.

Storage andTransportation

1) REFLOMAX GLODIAN™ SG-8000 series is supplied in cartons specially made in considerration of roll sizes.
   The roll should be stored in the original carton with standard spacers that we provide. These spacers minimize formation of pressure marks and surface damage shich can be caused by impact from outside.
   Please make sure that partly processed rolls should also be stored in the same condition as suggested above.
2) REFLOMAX GLODIAN™ SG-8000 series should be stored in a cool, dry indoor area that is protected from direct sunlight. Recommended temperatures for storage are from 18°C~24°C (65°F~75°F) and relative air humidity from 46% to 60%.
3) It is advisable to stay rolls in horizontal condition. If the rolls are storedin a vertical, a negative influence on the film's characteristics is expected.

Size & Packing

Roll Size 123cmx45.7m (48.4in x 50yds)
Gross 29 kgs (63.9lb)
Weight 31 kgs (68.3lb)
Packing 40 rolls per pallet / 320 rolls per 20' container

Printing

1) REFLOMAX GLODIAN™ SG-8000 series can be scree-printed with screen printing ink for traffic sign or digitally printed with UV digital ink.
2) There could be quality deviation by printing method, ink print machine, printing process, doncition and technical skell of user etc., therefore, pre-testing before printing is necessary.
3) It is recommended to use REFLOMAX GLODIAN™ EC-1001 on the surface of printed film in order to improve durability of ink.

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1. Screen printing advance preparations

1) It is recommended to use screen printing ink for traffic sign that is a solvent based, two liquid base (ink+hardener), and quick drying color system.
2) Printing should be done in compliance with guideline from ink supplier.
3) The screen-printing table must be flat and mechanically stable. Vacuum conveying is required for printing film sheets.
4) As the hardness or elasticity of squeegees has a decisive in fluence on the printing result, squeegee rubbers with Shore hardness of 65~75A are recommended.
5) The squeegees and screen must be washed with proper solvent before starting screen-printing.
6) Also, surface of film should be cleaned by anti-dustoranti-static fabric to make sure there is no any substance on surface prior to printing.

2. Screen printing

1) Optimum conditions for the printing process require an air temperature ranging 20°C(68°F) to 24°C(75°F) and relative air humidity from 20% to 50%. Unfavorable ambient conditions may require the use of thinning or retarding agents to adjust the ink for processing. However, it might cause not to meet required specification values for color and retroreflection that the thinning or retarding agents are used too much.
2) The distance between the screen and the film surface should be set suitably according to testing result. If the distance is too short, it could lead to results in poor print quality.
3) It is recommended to maintain a medium squeegee speed of approximately 0.75m/s and the squeegee should be applied at an angle of 30° to the print surface. Squeegee speed could cause poor print quality when it's too quick or too slow.
4) As excessive squeegee pressure can result in smearing or blurred contours and edges, proper testing and user's skill are necessary.

3. Drying after screen printing

1) The sheet must be flat when drying.
2) The drying time of the prints depends on the type of sheet or ink used, ambient temperature and specific local conditions, etc.
3) Forced drying is recommended by means of drying in a convection oven to facilitate quick and economical processing of the sheets after printing. In case of using this forced drying, the film should be used after 48 hours from drying, maximum after a week.
4) Please note that the maximum number of sheets stacked should not exceed 40 sheets. If excessive numbers of sheets are stacked, it could cause result in poor quality on printed surface by high pressure.
5) Prints on pre-laminated traffic sign substrates should be stored vertically and each sign substrate should maintain proper distance to avoid making bad influence in quality of printed surface.

4. UV digital printing

1) The printing process requires an air and material temperature between 20°C(68°F) and 26°C(78°F) and relative air humidity between 40% and 60%. It is optimum condition to make the room free from dust.
2) It is requires to wear cotton gloves to prevent contamination of the surface during printing process.
3) It is necessary to set up optimum condition after enough testing prior to print and skill of an expert is required to acquire good quality of printing as there could be quality deviation by printing equipment.

Cutting, plotting

1) REFLOMAX GLODIAN™ SG-8000 seriescan be cut by means of commercial cutting plotter, die-cut plotter, etc.
2) It is not recommended to cut several sheets at the same time when cutting by die-cut plotter.
3) It is recommended to set up proper pressure and cut proper number of sheets when it's cut by stack cutter.
4) It is highly recommended that every cutting process should be carried out with setting up proper process condition made after enough testing done in advance.

Adhesive bonding and lamination

1) In order to acquire optimum condition of adhesion with REFLOMAX GLODIAN™ SG-8000 series, it is important to make the substrate clean.

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2) The substrate must be free of dust, oil, fats, silicon or other contamination. If the substrate needs to be treated with a solvent like IPA, the next processing step cannot be carried out until the solvent is completely evaporated.
3) The surface of substrate should be sleek. In case of adhesion on substrate that is not sleek like welded joint pert, there could be possibility to make difference in adhesion strength by working condition and ambience.
4) REFLOMAX GLODIAN™ SG-8000 series is optimized for application onto flat substrates of aluminum alloys or galvanized steel.
5) It is not recommended to carry out lamination at air and material temperatures of less than 15°C(59°F) due to the fact that it can cause problem in adhesion strength. The optimum bonding temperature is 21°C(69°F) and the films should be stored in the rooms in which they will be processed with optimum condition for at least 48 hours before lamination.
6) REFLOMAX GLODIAN™ SG-8000 series has coated pressure sensitive adhesive layer complying with class 1 of Section 4.3 Backing Classes of ASTM D4956-16b standard. Therefore there is no need to useadditional and/or previous heat, solvent agent in order to apply sheeting on the board. It is good enough to use manual pressure only. Please make sure NOT to apply esp. excessive heat while applying reflective sheeting on the board, which possibly may cause serious damages on the basic qualities of sheeting.
7) If you use a film-laminating machine, the coated rubber of upper roller should be with Shore hardness 65~75A, and the roll gap should be adjusted over the entire width not to make a deviation.
8) The bonding process should be carried out with proper pressure set up after pre-testing.
9) If it is necessary to apply two pieces of sheeting overlapped, upper sheet should be placed on lower sheet to avoid rainwater getting into between them in case rain.
10) Please be careful about direction of sheets when bonding process and make sure that it is carried out in one-way direction. There could be deviation in reflective performance if it is adhered crossed at direction of sheets.
11) It is advisable that the sheets used for bonding process are processed under the same light conditions.
12) It is recommended to use only films from the same roll for one substrate in order to have color-matched. If more than one roll is required, only film from the same production lot should be used.
13) It is recommended that applied substrate should be installed after storing for 72 hours under condition of temperature 20°C(68°F)~26°C(78°F) and relative air humidity 40%~60% in order to have enough adhesion strength on substrate.
14) When using films, it is necessary to take all process and work condition into account which can make impact on adhesion strength of product and bonding processing.

    Also,pleaseperformenoughtestinadvanceconsideringwhetherit's
    suitablefortheapplicationornotandperformanceofproduct.
    When you intend to apply products to application above suggested applications, please have a prior consultation with REFLOMAX fully.

Cleaning of the applied products

Surfaces should only be cleaned with clear water, water/isopropanol(80/20%) or diluted soap solution.
Please do not use any solvents or abrasive cleaning agents like metal or sand for the cleaning of reflective films. This could cause serious damage onsurfaces.

IMPORTANT NOTICE

Durability

The durability of REFLOMAX GLODIAN™ SG-8000 series and finished signs using themwill depend upon substrate selection and preparation, compliancewith recommended application procedures, geographic area, exposure conditions, and maintenance.
Maximum durability of REFLOMAX GLODIAN™ SG-8000 series can be expected in applications subject to vertical exposureon stationary objects when processed and applied to properly prepared aluminum according to Reflomax's recommendations. Periodic sign inspection and regular sign replacement are strongly recommendedin order for sign owners to establish their own effective service life expectation beyond any durabilitywarranty, if provided.

Substrate

The user must determine the suitability of any nonmetallic sign backing for its intended use. Applications to unprimed, excessively rough or non-weather resistant surfacescan shorten the performance of such applications.

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Exposure

Exposure to severe or unusual conditions can shorten the performance of such applications. Signs inmountainous 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.

Splice

There could be one splice per roll and additional meter will be provided in case of roll with splice.

Warranty

No warranty is given for purposes other than those listed in the Technical Datasheet or which are not processed according to Reflomax's processing and handling instructions. The durability of the signs will depend on a variety of factors, including but not limited to substrate selection and preparation, compliance with recommended application guidelines, geographic area, exposure conditions and maintenance of the product and finished sign. Sign failures caused by the substrate or improper surface preparations are not the responsibility of Reflomax. Please refer to the full warranty document available at www.reflomax.com for detailed information.

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