

Nikkalite® Flexible Crystal Grade microprismatic sheeting

Introduction

With 30 years' experience, Rennicks (UK) Ltd has long been at the forefront of developing and supplying the latest traffic sign technology to clients who include the Highways Agency, the emergency services, local authorities and signmakers throughout the UK.

Nikkalite® Flexible Crystal Grade is a flexible microprismatic retroreflective sheeting designed for emergency vehicle liveries complying with the Home Office Police Scientific Development Branch (PSDB) [now the Home Office Scientific Development Branch (HOSDB)] High-Conspicuity Livery specification.



Nikkalite® Flexible Crystal Grade retroreflective and fluorescent retroreflective liveries are very conspicuous providing early recognition of the vehicles position to other road users due to;

- high retroreflectivity during the hours of darkness
- high conspicuity during twilight hours of fluorescent colours
- high daytime contrast colours

| Nikkalite® Flexible Crystal Grade | | | | Warranty* |
|-----------------------------------|------------|--------------------------|-------------|-----------|
| White 92802 | Blue 92806 | Red 92805 | Green 92808 | 10 years |
| Fluorescent Yellow Green 92844 | | Fluorescent Orange 92847 | | 10 years |

* Warranted life when processed by Gold Converter, applied in line with NCI procedures & exposed vertically, Terms and Conditions apply.

Retro-reflectivity Typical Data

| Obs. Angle | Colour | Entrance Angles | | | PSDB Spec | | |
|------------|--------|-----------------|-------|-------|-----------|-------|-------|
| | | 5deg | 30deg | 45deg | 5deg | 30deg | 45deg |
| 0.2 | Fl Y/G | 979 | 592 | 80 | 300 | 150 | 33 |
| 0.33 | | 494 | 289 | 50 | 80 | 60 | 16 |
| 0.5 | | 328 | 213 | 24 | 50 | 20 | 9 |
| 1 | | 72 | 65 | 18 | 8 | 6 | 2 |
| 0.2 | White | 963 | 558 | 71 | 350 | 150 | 40 |
| 0.33 | | 504 | 338 | 51 | 150 | 60 | 30 |
| 0.5 | | 346 | 249 | 30 | 110 | 60 | 20 |
| 1 | | 80 | 91 | 20 | 9 | 6 | 3 |

Day time chromaticity

| Colour | Daytime Chromaticity co-ordinates | | | | | | | | Luminance factor |
|--------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------------------------|
| | 1 | | 2 | | 3 | | 4 | | β |
| | 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 | $Y \geq 0.40$ |
| Yellow | 0.498 | 0.412 | 0.557 | 0.442 | 0.479 | 0.520 | 0.438 | 0.472 | $0.45 \geq Y \geq 0.24$ |
| Red | 0.648 | 0.351 | 0.735 | 0.265 | 0.629 | 0.281 | 0.565 | 0.346 | $0.15 \geq Y \geq 0.03$ |
| Blue | 0.140 | 0.035 | 0.244 | 0.210 | 0.190 | 0.255 | 0.065 | 0.216 | $0.10 \geq Y \geq 0.01$ |
| Green | 0.026 | 0.399 | 0.166 | 0.364 | 0.286 | 0.446 | 0.207 | 0.771 | $0.12 \geq Y \geq 0.01$ |
| Fluorescent Yellow Green | 0.387 | 0.610 | 0.369 | 0.546 | 0.428 | 0.496 | 0.460 | 0.540 | $Y \geq 0.60$ |
| Fluorescent Orange | 0.583 | 0.416 | 0.535 | 0.400 | 0.595 | 0.351 | 0.645 | 0.355 | $Y \geq 0.25$ |



BRIGHT & DURABLE

Flexible Crystal Grade offers excellent reflectivity at long and short distances as well as narrow and wide entrance angles. These properties ensure drivers and pedestrians can see the approaching emergency vehicle at any angle, allowing quick recognition when speed is of the essence and prompt action can then be taken to allow the vehicle to continue safely on its way.

Nikkalite® Flexible Crystal Grade offers a minimum performance life of 7 years.



STRONG & FLEXIBLE

Because vehicles come in all shapes and sizes, Nikkalite® flexible materials allow for simple and fast application on most curves and recesses.

Tough and durable, Nikkalite® Crystal Grade has been designed to retain its strength and flexibility when applied on most vehicle contours.

ADVANTEDGE EDGE SEAL TECHNOLOGY

Arguably the strongest and most accurate edge sealing on the market today, Nikkalite® Flexible Crystal Grade with **AdvantEdge** impenetrable edge seal technology ensures a quality finish every time.



COMPLIANT

Nikkalite® Flexible Crystal Grade is approved by the HOSDB for Battenburg livery and meets all current standards. The prisms have been specially designed to achieve optimum reflection. Each cm² of the prism layer contains in excess of 5k micro-prisms accurately aligned providing outstanding reflectivity and angularity, offering early recognition and visibility of the emergency services vehicles.

Red Crystal Grade conforms to the Highways Agency Chapter 8 operations and HOSDB guidelines.

The perfect fit in more ways than one.



Reliability of information

All recommendations and technical information contained herein are based on experience and tests, which the manufacturer believes to be reliable, but their accuracy and completion are not warranted.

The user is cautioned to undertake tests to determine the suitability of a particular product for the intended application.

Warranty

Nikkalite® & Hi-S Cal® products are warranted to be free from defects in materials and workmanship at the time of their sale.

Subject to paragraph two hereof, Nikkalite® & Hi-S Cal® products are sold without any warranty whatsoever, including warranties of merchantability or fitness for a particular purpose.

The sole remedy for failure of Nikkalite® & Hi-S Cal® products to conform to said warranty is the replacement of the defective products; neither the manufacturer nor the seller shall be liable for any loss, damage or injury, direct or indirect, consequential or incidental, arising from the use of or inability to use said products.

Nikkalite® & Hi-S Cal® products sold in the United Kingdom are sold with a warranty subject to the Warranty Agreement between Rennicks (UK) Limited, Nippon Carbide Industries Inc., and the sheeting converter.

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Nikkalite® Ultralite Extra (ULX) 600 series retroreflective sheeting

Description

Nikkalite® Ultralite Extra (ULX) 600 series is a high intensity prismatic (HIP) retroreflective sheeting manufactured by Nippon Carbide Industries (NCI), designed for use on road traffic signs. The sheeting construction is based on advanced prism designs which provide the driver with excellent viewing angularity of the traffic sign during the hours of darkness through a wide range of viewing angles. The material is coated with a permanent high tack adhesive protected by a plastic liner.

Physical & visual performance

Nikkalite® Ultralite Extra is certified to EN 12899-1; 2007 Fixed, vertical road traffic signs to class R2. Further details can be provided on request.

Daytime colour and luminance factor

In accordance with CUAP Table 4.

| Colour | | Chromaticity Coordinates | | | | Luminance factor B2 |
|------------|---|--------------------------|-------|-------|-------|---------------------|
| | | 1 | 2 | 3 | 4 | |
| White 612 | x | 0.305 | 0.335 | 0.325 | 0.295 | ≥ 0.40 |
| | y | 0.315 | 0.345 | 0.355 | 0.325 | |
| Yellow 604 | x | 0.494 | 0.470 | 0.513 | 0.545 | ≥ 0.24 |
| | y | 0.505 | 0.480 | 0.437 | 0.454 | |
| Blue 606 | x | 0.130 | 0.160 | 0.160 | 0.130 | ≥ 0.01 |
| | y | 0.090 | 0.090 | 0.140 | 0.140 | |
| | y | 0.415 | 0.415 | 0.500 | 0.500 | |

Minimum coefficient of retroreflectivity; Table 7 Class R2

The sheeting may be applied horizontally or vertically, do not mix orientations on the same sign. The strongest reflectivity is provided when the sheeting is applied horizontally.

| Obs' angle | Ent angle | Colour | | |
|------------|-----------|--------|--------|------|
| | | White | Yellow | Blue |
| 12' | +5° | 250 | 170 | 20 |
| | +30° | 150 | 100 | 11 |
| | +40° | 110 | 70 | 8 |
| 20' | +5° | 180 | 120 | 14 |
| | +30° | 100 | 70 | 8 |
| | +40° | 95 | 60 | 7 |
| 2° | +5° | 5 | 3 | 0.2 |
| | +30° | 2.5 | 1.5 | # |
| | +40° | 1.5 | 1.0 | # |

indicates "Value greater than zero but not significant or applicable".

Processing information

The sheeting can be processed by the following methods;

- A100 coloured overlays.
- Screenprinted with N3600 inks
- Digitally printed on Rennicks Approved Digital Printer

Further details can be provided on request.

For further technical information refer to;

- Sign shop processing instructions
- On site storage instructions
- Sign cleaning procedures

Health & Safety (COSHH)

Although the adhesive contains a small amount of solvent, it is almost certain that this solvent will not be emitted from the sheeting. For further information contact Rennicks UK for a MSDS data sheet.

Durability

When Nikkalite® ULX sheeting is processed and applied in line with NCI instructions, and exposed vertically under normal weathering conditions in the UK or Ireland can be expected to have a useful performance life as shown in the table below. Actual performance depends greatly on type and treatment of substrate and on weathering conditions.

| Product code | Effective life UK & Ireland |
|--------------|-----------------------------|
| 612 White | 12 years |
| 604 Yellow | 12 years |
| 606 Blue | 12 years |

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Nikkalite® products sold in the United Kingdom are sold with a warranty subject to the Road Traffic Sign Warranty agreement between Rennicks (UK) Limited, Nippon Carbide Industries Inc., and the Traffic Sign Manufacturer.

Nikkalite® Flexible Engineering Grade (FEG)

Description

Nikkalite® Flexible Engineering Grade (FEG) is a flexible glass-beaded retroreflective sheeting that renders retroreflectivity during darkness. It is designed for use on emergency vehicles and fleet markings where application to riveted and corrugated surfaces may be required. The material is highly resistant to extremes of hot, cold, dry and humid weathering conditions and vehicles liveried with FEG sheeting are attractive in appearance and highly visible during both day and night-time conditions.



Traffic Signs Manual Chapter 8 Operations; O5.2.3(c)

Chapter 8 requires high visibility rear vehicle chevron marking for vehicles stopping on the highway for works purposes or inspections.

O5.2.3(c) states; Chevron markings comprising alternate strips of retroreflective red material and fluorescent yellow non-retroreflective material, of not less than 150mm width each, inclined at 45-60° to the horizontal and pointing upwards, should cover as much of the rear-facing portion of the vehicle as possible...”



Nikkalite® 48005 Red FEG used with **Hi-S Cal® Fluorescent Light Yellow 7F-310** complies with O5.2.3(c) colour requirements

(Refer to separate technical information for Hi-S Cal® sheetings)

Retroreflectivity

Nikkalite® FEG is available in 24” and 48” x 50yds rolls in the following colours;

| Colour | Black | Yellow | Red | Blue | Green | White |
|------------|-------|--------|-------|-------|-------|-------|
| Product No | 48003 | 48004 | 48005 | 48006 | 48008 | 48012 |
| OA 0.2° | 3 | 50 | 5 | 6 | 7 | 70 |
| EA -4° | | | | | | |

Average coefficient of retroreflection cd/lux/sq.mtr. OA; Observation angle EA; Entrance angle

Physical properties

| Properties | Test method | Results |
|-----------------------------|-------------------------------|--------------|
| Average thickness | Micrometer | 150+/-5um |
| Average Gloss | Glossmeter | >85 at 60°C |
| Tensile strength | Instron tester | >2.3kgf/25mm |
| Elongation | Instron tester | >120 |
| Min application temperature | Flat smooth surface | 15°C |
| Max application temperature | Corrugated / Riveted surfaces | 25°C |

Expected performance life

FEG can be expected to have a useful working life of up to 7 years on vertical panels for standard colours.

Removal of livery

Warm the panel by applying gentle heat to the surface and peeling away.

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Warranty

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The sole remedy for failure of Nikkalite® & Hi-S Cal® products to conform to said warranty is the replacement of the defective products; neither the manufacturer nor the seller shall be liable for any loss, damage or injury, direct or indirect, consequential or incidental, arising from the use of or inability to use said products.

Nikkalite® & Hi-S Cal® products sold in the United Kingdom are sold with a warranty subject to the Warranty Agreement between Rennicks (UK) Limited, Nippon Carbide Industries Inc., and the sheeting convertor.