

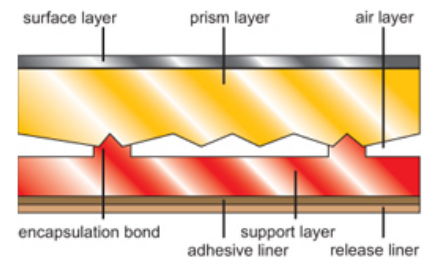
## Nikkalite<sup>®</sup> Crystal Grade CW 92800 Series Microprismatic Retroreflective Sheeting

### Description

Nikkalite<sup>®</sup> Crystal Grade CW is a high performance microprismatic retroreflective sheeting manufactured by Nippon Carbide Industries (NCI), and is designed for use on road traffic signs.

The technology 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 range of viewing angles.

Crystal Grade CW offers high performance and long durability with a life expectancy in excess of 12 years for traffic signs mounted vertically in the UK & Ireland. The material is coated with a permanent high tack adhesive on the reverse protected by a plastic liner.



### BS 8408 Physical & visual performance

When tested in accordance with BS 8408, Crystal grade CW complies with the requirements of 4.3.1 Adhesion to the Substrate, 4.3.2 Salt Spray Resistance, 4.3.3 Impact Resistance, 4.3.4 Hermeticity of sheeting cells and 4.3.5 Appearance after Weathering.

When tested in accordance with section 5.2.1 of BS 8408:2005, the chromaticity co-ordinates and the luminance factor of Crystal Grade CW conform to Table 2 and Table 3 of BS 8408:2005.

### Photometric rating to BS 8408

BS 8408; 2005 *Testing and performance of microprismatic retroreflective sheeting materials* differs from the traditional approach of publishing the minimum coefficient of retroreflectivity against which sign face sheetings are tested.

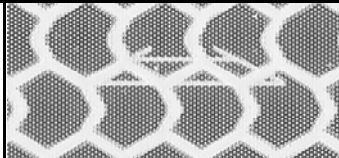
In BS 8408 the characteristics of microprismatic retroreflective sheetings are tested, and their performance rated for specific driving scenarios. Refer to separate information "*How to use BS 8408*"

A luminance index system has been developed to rate the ability of a microprismatic sheeting to provide the luminance and this is shown against rating scenarios. There are 256 recognised scenarios in BS 8408, and a number of example scenarios are shown below for Crystal grade CW microprismatic sheeting.















### Datum axis

Performance index results for CW sheeting are measured with the sheeting as example 2 in Annex A of BS 8408; i.e. in a horizontal axis as per diagram below. The strongest performance / luminance for CW is provided when the sheeting is applied across the sign face left to right as in the vast majority of UK sign manufacturing situations. Market analysis of sign manufacturers confirmed the horizontal application direction occurs in over 97% of signs. If the sheeting is applied in a vertical direction the values may be slightly lower or higher in certain scenarios. Please contact Rennicks UK for further information.

GRADE	DATUM MARK
CW	













BS 8408 typical road scenarios.

### Road type; Motorway

Typical driving speed	Sign "x" height	Sign position	Driving Scenario	Veh' type	CW rating Directional Sign Type A	CW rating Regulatory & Warning Sign Type B
70 mph	300	Left verge	D1 A1 V1 P1		4.20	7.46
			D1 A1 V2 P1		0.91	1.16
			D1 A2 V1 P1		2.07	3.62
			D1 A2 V2 P1		0.44	0.56
70 mph	300	Right verge	D1 A1 V1 P2		3.07	5.45
			D1 A1 V2 P2		0.66	0.83
70 mph	300	Overhead	D1 A1 V1 P3		1.93	3.43
			D1 A1 V2 P3		0.41	0.52
70 mph	300	Low left	D1 A1 V1 P4		11.56	20.52
			D1 A1 V2 P4		2.91	3.69
			D1 A2 V1 P4		5.70	9.94
			D1 A2 V2 P4		1.41	1.79







BS 8408 recommended minimum luminance; Type A Directional Sign unlit 1.0 lit 1.0 Type B Regulatory & Warning Sign unlit 1.0 lit 3.0

### Road type; Trunk road

Typical driving speed	Sign "x" height	Sign position	Driving Scenario	Veh' type	CW rating Directional Sign Type A	CW rating Regulatory & Warning Sign Type B
50-60 mph	200	Left verge	D2 A1 V1 P1		4.62	6.78
			D2 A1 V2 P1		0.45	0.59
			D2 A2 V1 P1		2.30	3.25
			D2 A2 V2 P1		0.23	0.31
50-60 mph	200	Right verge	D2 A1 V1 P2		3.38	4.95
			D2 A1 V2 P2		0.32	0.42
50-60 mph	200	Overhead	D2 A1 V1 P3		2.36	3.46
			D2 A1 V2 P3		0.21	0.28
50-60 mph	200	Low left	D2 A1 V1 P4		36.90	54.11
			D2 A1 V2 P4		4.07	5.32
			D2 A2 V1 P4		18.36	25.91
			D2 A2 V2 P4		2.09	2.76

BS 8408 recommended minimum luminance; Type A Directional Sign unlit 1.0 lit 1.0 Type B Regulatory & Warning Sign unlit 1.0 lit 3.0

### Road type; Urban road

Typical driving speed	Sign "x" height	Sign position	Driving Scenario	Veh' type	CW rating Directional Sign Type A	CW rating Regulatory & Warning Sign Type B
30-40 mph	125	Left verge	D3 A1 V1 P1		3.34	4.29
			D3 A2 V1 P1		1.67	2.18
30-40 mph	125	Right verge	D3 A1 V1 P2		2.13	2.75
30-40 mph	125	Overhead	D3 A1 V1 P3		1.30	1.67
30-40 mph	125	Low left	D3 A1 V1 P4		33.09	42.57
			D3 A2 V1 P4		16.55	21.66

BS 8408 recommended minimum luminance; Type A Directional Sign unlit 1.0 lit 1.0 Type B Regulatory & Warning Sign unlit 1.0 lit 3.0

*Note; The above values have been measured by Nippon Carbide Industries (NCI), in line with BS 8408 procedures.*

Ratings for alternative scenarios are available from Rennicks (UK) Ltd.

## **Processing information**

### **Roll storage**

Refer to separate technical information; Roll Storage, Substrate Preparation & Application of sign face sheetings.

### **Application of Crystal grade CW sheeting**

Nikkalite® 92800 series sheeting must be butt jointed and not overlapped. CW will bond to clean smooth surfaces of tested and approved metal, and coated metal. Refer to detailed separate technical information sheet; Roll Storage, Substrate Preparation & Application of sign face sheetings

### **Coloured overlay films**

Nikkalite® PA100 self-coloured transparent overlay films have a clear acrylic pressure sensitive adhesive and are designed to offer a simplified and efficient system of sign manufacture for various types of Road Traffic Signs manufactured to BS 8408 & ETA's.

Refer to separate detailed technical information; PA100 Coloured overlay films

### **Crystal grade CW 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 please contact Rennicks UK for a COSHH data sheet.

### **Screen printing**

Crystal grade should be screen printed with Nikkalite® N3600 inks which are durable, highly transparent, quick drying screen printing inks, that bond strongly and permanently to the surface of CW Crystal grade sheeting. Refer to separate detailed; Screen printing technical information

### **Colour matching**

When using more than one piece of reflective sheeting together, sheeting from the same roll should be used for uniform colour matching and reflectivity. Every other piece of material should be rotated by 180°, so the same roll edges come together and butted together.

Microprismatic sheetings must not be overlapped.

Colour matching is the responsibility of the sign manufacturer.

### **Graphic cutting**

The material must be allowed to condition, out of its box and correctly supported, ideally in a room with an ambient temperature of 15°C to 25°C (59°F to 77°F) before cutting.

Certain upright friction and flat bed plotters are suitable for cutting Nikkalite® Crystal grade CW sheeting. The sheeting should be tested to determine suitability of equipment. Off cuts of sheeting should be stored flat or tightly wound around the outside of a core diameter of 90mm or greater.

### **Packaging & Storage of finished signs prior to installation**

Finished signs should be adequately packaged to prevent damage during handling and transit. The sheeting liner may be used against the sign face in addition to bubble wrap and the signs should be placed face to face.

The effective performance life and guarantees may be become void by mishandling, or incorrect storage and installation techniques. Refer to separate information; Handling and storage instruction sheet.

### Sign cleaning

Signs covered with DT142-S Dewtect dew resistant sheeting should not require cleaning and the surface properties may be damaged or destroyed by cleaning. Refer to separate information; Sign cleaning.

### Durability

When processed and applied in line with NCI instructions, Nikkalite® 92800 Crystal grade sheeting when 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.

However, actual performance depends greatly on type and treatment of substrate and on weathering conditions.

Type	Effective life UK & Ireland
92802 White	12 years
92804 Yellow	12 years
92805 Red	12 years
92806 Blue	12 years
92808 Green	12 years
92828 Dark Green	12 years

### 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® products are warranted to be free from defects in materials and workmanship at the time of their sale. Subject to paragraph two hereof, Nikkalite® products are sold without any warranty whatsoever, including warranties of merchantability or fitness for a particular purpose. The sole remedy for failure of Nikkalite® 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® 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.

For further information please contact



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