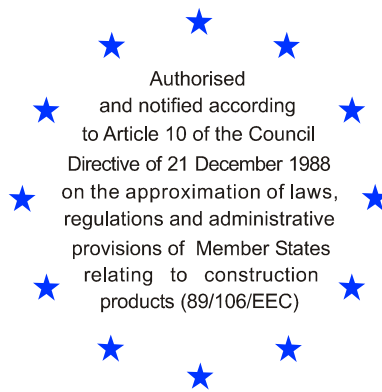


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# DIBt

Mitglied der EOTA  
*Member of EOTA*

## European Technical Approval ETA-10/0072

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung  
*Trade name*

Nikkalite Crystal Grade (CRG) Serie 92000 mit transparentem  
Farbfilm Acryl-Cal Serie 100

*Nikkalite Crystal Grade (CRG) 92000 series with transparent overlay film  
Acryl-Cal 100 series*

Zulassungsinhaber  
*Holder of approval*

Nippon Carbide Industries  
(Netherlands) B.V.  
Eisterweg 5  
6422 PN Heerlen  
NIEDERLANDE

Zulassungsgegenstand  
und Verwendungszweck  
*Generic type and use  
of construction product*

Mikroprismatisches retroreflektierendes Folienmaterial

*Microprismatic Retro-reflective Sheeting*

Geltungsdauer: vom  
*Validity: from*  
bis  
*to*

26 March 2010

26 March 2015

Herstellwerke  
*Manufacturing plants*

Nippon Carbide Industries Co., Inc. (Hayatsuki Factory)  
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Japan

Nikka Polymer Co., Inc. (Sano Factory)  
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Diese Zulassung umfasst  
*This Approval contains*

16 Seiten  
*16 pages*



Europäische Organisation für Technische Zulassungen  
European Organisation for Technical Approvals

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products<sup>1</sup>, modified by Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by law of 31 October 2006<sup>5</sup>;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>.
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1 Official Journal of the European Communities L 40, 11 February 1989, p. 12  
2 Official Journal of the European Communities L 220, 30 August 1993, p. 1  
3 Official Journal of the European Union L 284, 31 October 2003, p. 25  
4 *Bundesgesetzblatt Teil I 1998*, p. 812  
5 *Bundesgesetzblatt Teil I 2006*, p.2407, 2416  
6 Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of the product and of the intended use

#### 1.1 Definition of the construction product

The product consists of a retro-reflective foil on the basis of microprisms, which consist of optical elements, where the retro-reflection is created by total internal reflection on prisms. The microprisms are moulded in a transparent polymer enclosed in air capsules and provided with an adhesive, which can connect the foil with a substrate. The foil has a smooth surface and a regular structure visible on the surface forming the air capsules and, if need be, an orientation mark.

The product is delivered as reflective foil consisting of the components given in Table 1.

Trade name	Component	Colors/Code		Properties
Nikkalite Crystal Grade (CRG) 92000 series	self-adhesive retro-reflective foil on the basis of microprisms	White Yellow	92802 92804	foil thickness: 300 – 600µm  dimension of the roll: 1200 mm x 45.7 m or customized dimensions
Nikkalite Acryl-Cal A-Cal 100 series	transparent self-adhesive colour film	Yellow Red Blue Orange Green Green 2 (dark green) Brown	104 105 106 107 108 128 109	foil thickness: 100 – 300µm  dimension of the roll: 1200 mm x 45.7 m or customized dimensions

Table 1: Components of the reflective foil "Nikkalite Crystal Grade (CRG) 92000 series with transparent colour film Acry-Cal 100 series"

#### 1.2 Intended use

The construction product described here is used to manufacture signal aspects of fixed, vertical traffic signs (see also EN 12899-1). By the same token the retro-reflective foils can be used for traffic bollards according to EN 12899-2 or as reflectors for delineator posts according to EN 12899-3. The further intended applications are all other traffic signs and traffic installations, route guidance with retro-reflective elements and variable message signs.

- However, the intended application does not exclude the manufacture of road marking elements according to EN 1436. The foreseen sign support materials are aluminium or polycarbonate
- With this approval the following product characteristics are assessed in agreement with the manufacturer:

- Standard chromaticity and luminance factors,
- Night Colour,
- Specific Coefficient of luminous intensity Case A,
- Colour contrast factors,
- Impact resistance,
- Durability of the products: temperature resistance and visibility after external weathering.

The provisions made in this European technical approval are based on an assumed intended working life of the reflective foil of 10 years, provided that the conditions laid down in sections 4.1, 4.2, and 5.1 for the manufacture, packaging, transport and storage are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the construction.

## **2 Characteristics of product and methods of verification**

### **2.1 General**

The identification of the product and the judgement of the qualification for the intended use of the reflective foil were performed on the basis of the assessment procedures agreed within EOTA.

The European technical approval for the product was evaluated and issued on the basis of the information/data and test results specifying the product in detail are deposited with Deutsches Institut für Bautechnik. Changes during the production process of the product or its components which could include considerable modifications in the information/data deposited have to be communicated to Deutsches Institut für Bautechnik in advance. The notification has to be made before changes in the properties are made on the product so that Deutsches Institut für Bautechnik can check to what extent the planned modification has effects on the properties tested in this European technical approval and thus, can decide whether further assessment and/or alterations shall be carried out.

The properties of the product, which are not described in the European technical approval shall correspond to the relevant values laid down in the documentation to the European technical approval, examined by Deutsches Institut für Bautechnik.

### **2.2 Properties of the product "Nikkalite Crystal Grade (CRG) 92000 series with transparent colour film Acryl-Cal 100 series"**

#### **2.2.1 Release of dangerous substances**

The product complies with the provisions of Guidance Paper H ("A Harmonized Approach Relating to Dangerous Substances Under the Construction Products Directive", edition 2002) about the dangerous substances. A letter of confirmation by the manufacturer is available.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

#### **2.2.2 Visibility of "Nikkalite Crystal Grade (CRG) of the 92000 series with transparent colour film Acryl-Cal 100 series"**

The properties of the product shown in paragraph 1.2 were tested for the granting of this European technical approval.

Detailed information on the test results are deposited with Deutsches Institut für Bautechnik.

To prepare the test specimens the samples of the reflective foil were placed on an even aluminium plate with a thickness of 2.0 mm ( $\pm 0.05$  mm) by the manufacturer.

#### 2.2.2.1 Standard chromaticity and luminance factors

The determination of the standard chromaticity and the luminance factors (see Table 2) was based on the following conditions:

The chromaticity coordinates (x, y) and the luminance factor  $\beta_v$  were measured according to the CIE publication 15.2 "Colorimetry", edition 1986, using the overall spectral radiance factors measured in 45/0 geometry and calculated for the CIE 1931 (2°) standard colorimetric observer with the values of the CIE illuminant D65.

The position of the sample in the measuring system was shown by an orientation mark. The orientation mark was set at 90° to the plane of incidence. In doing so the plane of incidence was formed from the right angle between the surface of the sample and the incident beam of light.

Colour		Chromaticity coordinates				met / not met	Luminance factor Class
		1	2	3	4		
yellow on white	x	0.494	0.470	0.513	0.545	met	B2 $\geq 0.24$
	y	0.505	0.480	0.437	0.454		
red on white	x	0.735	0.700	0.610	0.660	met	B2 $\geq 0.03$
	y	0.265	0.250	0.340	0.340		
green on white	x	0.110	0.170	0.170	0.110	met	B2 $\geq 0.03$
	y	0.415	0.415	0.500	0.500		
green 2 on white	x	0.313	0.313	0.248	0.127	met	B2 0.01 – 0.07
	y	0.682	0.453	0.409	0.557		
blue on white	x	0.130	0.160	0.160	0.130	met	B2 $\geq 0.01$
	y	0.090	0.090	0.140	0.140		
orange on white	x	0.631	0.560	0.506	0.570	met	B2 $\geq 0.14$
	y	0.369	0.360	0.404	0.429		
brown on white	x	0.455	0.523	0.479	0.558	met	B2 0.03 – 0.09
	y	0.397	0.429	0.373	0.394		
red on yellow	x	0.735	0.700	0.610	0.660	met	B2 $\geq 0.03$
	y	0.265	0.250	0.340	0.340		

Table 2: Chromaticity coordinates and luminance factors

#### 2.2.2.2 Night Colour

The determination of the night colours (see Table 3) was based on the following conditions:

The chromaticity coordinates (x, y) were measured according to the CIE publication 2-19, edition June 1996, using the overall spectral radiance factors as they were calculated for the CIE illuminant D65 and the CIE 1931 standard colorimetric observer 2°.

Colour		Chromaticity coordinates				met / not met
		1	2	3	4	
yellow on white	x	0.513	0.500	0.545	0.572	met
	y	0.487	0.470	0.425	0.425	
red on white	x	0.652	0.620	0.712	0.735	met
	y	0.348	0.348	0.255	0.265	
green on white	x	0.007	0.200	0.322	0.193	met
	y	0.570	0.500	0.590	0.782	
green 2 on white	x	0.007	0.200	0.322	0.193	met
	y	0.570	0.500	0.590	0.782	
blue on white	x	0.033	0.180	0.230	0.091	met
	y	0.370	0.370	0.240	0.133	
orange on white	x	0.645	0.613	0.565	0.595	met
	y	0.355	0.355	0.405	0.405	
brown on white	x	0.643	0.570	0.540	0.595	met
	y	0.355	0.365	0.405	0.405	
red on yellow	x	0.652	0.620	0.712	0.735	met
	y	0.348	0.348	0.255	0.265	

Table 3: Night Colour

### 2.2.2.3 Specific coefficient of luminous intensity (Case A)

The determination of the specific coefficients of luminous intensity  $R_A$  – Case A (see Tables 4 to 9) was based on the following conditions:

The specific coefficient of luminous intensity was measured according to the CIE Publication N° 54.2 "Retro-reflection by using the CIE illuminant A". In doing so each of the apertures available could be applied. The measurements were performed on the specified viewing angle  $\alpha$ , the incidence angle  $\beta$ , the rotation angle  $\epsilon$ , and the orientation angle  $\omega_s$ . In doing so, the viewing angle  $\beta$  was defined by its component  $\beta_1$ , with  $\beta_2 = 0$ . The rotation angle  $\epsilon$  and the orientation angle  $\omega_s$  were also equated with 0.

Geometry of measurements		Colors/Code							
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	green 2 on white	blue on white	orange on white	brown on white	red on yellow
12'	+ 5°	170	45	45	20	20	100	12	22.5
	+30°	100	25	25	15	11	60	8.5	12.5
	+40°	70	15	12	6	8	29	5	7.5
20'	+ 5°	120	25	21	14	14	65	8	12.5
	+30°	70	14	12	11	8	40	5	7
	+40°	60	13	11	5	7	20	3	6.5
2°	+ 5°	3	1	0.5	0.5	0.2	1.5	0.2	0.5
	+30°	1.5	0.4	0.3	0.3	#	1	#	0.2
	+40°	1.0	0.3	0.2	0.2	#	#	#	0.15
met / not met		met	met	met	met	met	met	met	met

Table 4: Minimum specific coefficient of luminous intensity; Class R2 Europe  
 # means value exceeding zero, but not clearly measurable and therefore not applicable for evaluation

Geometry of measurements		Colors/Code					
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	blue on white	orange on white	red on yellow
0.1°	+ 5°	550	170	85	55	425	85
	+20°	390	120	60	40	300	60
	+30°	275	85	40	28	210	42.5
	+40°	175	55	25	18	135	27.5
0.2°	+ 5°	400	125	60	40	310	62.5
	+20°	290	90	45	30	225	45
	+30°	210	65	30	20	160	32.5
	+40°	130	40	20	13	100	20
0.33°	+ 5°	275	85	40	28	210	42.5
	+20°	195	60	30	20	150	30
	+30°	145	45	20	15	110	22.5
	+40°	95	30	15	10	75	15
met / not met		met	met	met	met	not met	met

Table 5: Minimum specific coefficient of luminous intensity; class R3A Germany

Geometry of measurements		Colors/Code					
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	blue on white	orange on white	red on yellow
0.33°	+ 5°	195	60	30	19	150	30
	+20°	155	48	24	16	120	24
	+30°	110	33	17	11	83	16.5
	+40°	20	6	3	2	15	3
1.0°	+ 5°	23	7	3.5	2.5	18	3.5
	+20°	20	6	3	2	15	3
	+30°	13	4	2	1.5	10	2
	+40°	2	1	#	#	2	0.5
1.5°	+ 5°	10	3	1.5	1	7.5	1.5
	+20°	8	2.5	1	#	6.5	1.25
	+30°	6	2	#	#	4.5	1
	+40°	1	#	#	#	1	#
met / not met		met	met	met	met	not met	met

Table 6: Minimum specific coefficient of luminous intensity; class R3B Germany  
 # means value exceeding zero, but not clearly measurable and therefore not applicable for evaluation

Geometry of measurements		Colors/Code					
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	blue on white	orange on white	red on yellow
0.1°	+ 5°	720	250	90	45	450	125
	+30°	405	135	45	22	315	67.5
	+40°	270	85	27	13	180	42.5
0.2°	+ 5°	600	195	75	40	360	97.5
	+30°	310	90	30	18	225	45
	+40°	155	45	15	7	70	22.5
0.5°	+ 5°	140	40	18	9	110	20
	+30°	75	23	9	4	50	11.5
	+40°	55	16	5	2.5	40	8
met / not met		met	met	met	met	not met	met

Table 7: Minimum specific coefficient of luminous intensity; class R3A Greece



Geometry of measurements		Colors/Code				
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	blue on white	red on yellow
0.2°	+ 5°	300	80	45	20	40
	+30°	105	30	24	11	15
	+40°	35	9	7	3	4.5
0.33°	+ 5°	250	75	33	15	37.5
	+30°	90	30	18	7	15
	+40°	25	7	4	1.4	3.5
1.0°	+ 5°	55	13	8	3.5	6.5
	+30°	35	10	4.5	2	5
	+40°	10	4.5	1.8	#	2.25
met / not met		not met	not met	not met	not met	met

Table 8: Minimum specific coefficient of luminous intensity; class R3B Greece  
 # means value exceeding zero, but not clearly measurable and therefore not applicable for evaluation

Geometry of measurements		Colors/Code				
$\alpha$	$\beta_1$ ( $\beta_2 = 0$ )	yellow on white	red on white	green on white	blue on white	red on yellow
0.2°	+ 5°	350	110	45	25	55
	+15°	270	90	35	20	45
	+30°	190	60	24	11	30
	+40°	40	12	7	3	6
0.33°	+ 5°	250	75	35	17	37.5
	+15°	200	65	25	15	32.5
	+30°	130	35	18	7	17.5
	+40°	25	7	4	2	3.5
1.0°	+ 5°	65	20	10	5	10
	+15°	45	16	7	3.5	8
	+30°	40	13	5	2.5	6.5
	+40°	13	5	2	1	2.5
met / not met		not met	not met	not met	not met	not met

Table 9: Minimum specific coefficient of luminous intensity; class R3B Belgium

#### 2.2.2.4 Rotational symmetry

The rotational symmetry of the specific coefficient of luminous intensity which represents an additional requirement of the classes 3A and 3B (see table 10) was determined under the same conditions as the specific coefficient of luminous intensity (Case A, see 2.2.2.1.3). With an observation angle  $\alpha = 0.33^\circ$  and an entrance angle  $\beta_1 = 5^\circ$  ( $\beta_2 = 0^\circ$ ) the ratio between the minimum and the maximum specific coefficient of luminous intensity during rotation of  $\varepsilon$  was determined in  $25^\circ$  steps from  $-75^\circ$  to  $+25^\circ$ . The ratio shall not be greater than 2.5:1. The product satisfies this requirement.

Specific coefficient of luminous intensity ( $\text{cd} \cdot \text{lx}^{-1} \cdot \text{m}^{-2}$ ) - rotational symmetry		
Colour	Ratio	met / not met
yellow on white	1.20	met
red on white	1.26	met
green on white	1.20	met
green 2 on white	1.30	met
blue on white	1.20	met
orange on white	1.30	met
brown on white	1.20	met
red on yellow	1.40	met

Table 10: Rotational symmetry

#### 2.2.2.5 Colour contrast factor (K)

The determination of the colour contrast factor (see table 11) was based on the following conditions:

The colour contrast factors were calculated according to the specific coefficients of luminous intensity with an observation angle  $\alpha = 0.33^\circ$ , an entrance angle  $\beta_1 = 5^\circ$  ( $\beta_2 = 0^\circ$ ) and a rotation angle  $\varepsilon = 0^\circ$  in relation to the colour white ( $K = R_{\text{Acolour}} / R_{\text{AWhite}}$ ).

Colour	$K_{\min} - K_{\max}$	met / not met
yellow on white	0.65 - 0.90	met
red on white	0.20 - 0.35	met
green on white	0.05 - 0.16	not met
green 2 on white	0.06 - 0.14	not met
blue on white	0.05 - 0.10	met
orange on white	0.40 - 0.55	met
brown on white	0.03 - 0.10	met
red on yellow	0.20 - 0.35	met

Table 11: Colour contrast factor

### 2.2.3 Impact resistance

The determination of the impact resistance (see table 12) was based on the following conditions:

Product	Colour of the basic foil	Colour of the overlay film	met / not met
Microprismatic reflective foil  2.2.2 Visibility of "Nikkalite Crystal Grade (CRG) of the 92000 series with transparent colour film Acryl-Cal 100 series"	white 92802	yellow Overlay 104	met: There were no damages.
		red Overlay 105	
		green Overlay 108	
		green 2 Overlay 128	
		blue Overlay 106	
		orange Overlay 107	
		brown Overlay 109	
yellow 92804	red Overlay 105	met: There were no damages.	

Table 12: Impact resistance

The test was performed according to EN 12899-1:2001 by using a hard body impact with a mass of 450 g and a contact radius of 50 mm. The body impact was dropped from its height of 220 mm on a sample which was supported at the edge of a free surface of 100 mm x 100 mm.

### 2.2.4 Durability of "Nikkalite Crystal Grade CRG of the 92000 series with transparent colour film Acryl-Cal 100 series"

For the assessment of the durability a 3 years' natural weathering was carried out.

#### 2.2.4.1 Temperature resistance of "Nikkalite Crystal Grade CRG of the 92000 series with transparent colour film Acryl-Cal 100 series"

The determination of the temperature resistance of "Nikkalite Crystal Grade CRG of the 92000 series with transparent colour film Acryl-Cal 100 series" (see Table 13) was based on the following conditions:

The photometric properties of the reflective foil were determined by measuring the specific coefficient of luminous intensity  $R_A$  (see section 2.2.2.3). The measurements were carried out with an observation angle  $\alpha = 0.33^\circ$  and an entrance angle  $\beta_1 = 5^\circ$  ( $\beta_2 = 0^\circ$ ;  $\varepsilon = 0^\circ$ ).

The test specimens were subsequently stored in a convection oven for a period of 24 hours with one of the temperatures listed in the following:

Class	Temperature
1	80° C (± 2)
2	65° C (± 2)
3	50° C (± 2)

Then the test specimens were conditioned according to ISO 139 "Textiles - Standard atmospheres for conditioning and testing". All test results were determined as mean values from at least three samples.

The photometric properties of the test specimen had then been determined again by a new measurement of the specific coefficient of luminous intensity  $R_A$  according to section 2.2.2.3.

Product	Colour		Class
Microprismatic reflective foil  2.2.2 Visibility of "Nikkalite Crystal Grade (CRG) of the 92000 series with transparent colour film Acryl-Cal 100 series"	white 92802	yellow Overlay 104 red Overlay 105 green Overlay 108 green 2 Overlay 128 blue Overlay 106 orange Overlay 107 brown Overlay 109	1 [80 °C (± 2 °C)]
	yellow 92804	red Overlay 105	1 [80 °C (± 2 °C)]

Table 13: Temperature resistance

2.2.4.2 Standard chromaticity and luminance factors after natural weathering

Colour		Chromaticity coordinates				met / not met	Luminance factor Class
		1	2	3	4		
yellow on white	x	0.545	0.487	0.427	0.465	met	B2 ≥ 0.24
	y	0.454	0.423	0.483	0.534		
red on white	x	0.735	0.674	0.569	0.655	met	B2 ≥ 0.03
	y	0.265	0.236	0.341	0.345		
green on white	x	0.007	0.248	0.177	0.026	met	B2 ≥ 0.03
	y	0.703	0.409	0.362	0.399		
green 2 on white	x	0.313	0.313	0.248	0.127	met	B2 0.01 - 0.07
	y	0.682	0.453	0.409	0.557		
blue on white	x	0.078	0.150	0.210	0.137	met	B2 ≥ 0.01
	y	0.171	0.220	0.160	0.038		
orange on white	x	0.631	0.560	0.506	0.570	met	B2 ≥ 0.14
	y	0.369	0.360	0.404	0.429		
brown on white	x	0.455	0.523	0.479	0.558	not met	B2 0.03 - 0.09
	y	0.397	0.429	0.373	0.394		
red on yellow	x	0.735	0.700	0.610	0.660	not met	B2 ≥ 0.03
	y	0.265	0.250	0.340	0.340		

Table 14: Standard chromaticity and luminance factors after natural weathering

### 2.2.4.3 Specific coefficient of luminous intensity after natural weathering

Colors/Code	met / not met (met: $\geq 80\%$ of the values demanded in mint condition)
yellow on white	met
red on white	met
green on white	met
green 2 on white	met
blue on white	met
orange on white	met
brown on white	met
red on yellow	met

Table 15: Specific coefficient of luminous intensity  
(Case A) after natural weathering

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to the Decision 96/579/EC of 24.06.1996<sup>7</sup>, amended by the Decision 1999/453/EC<sup>8</sup>, system 1 of the attestation of conformity shall apply. This system of attestation of conformity is described in the following:

System 1: Certification of the conformity of the product by a approved certification body on the basis of:

- (a) Tasks for the manufacturer:
  - (1) factory production control;
  - (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;
- (b) Tasks for the notified body:
  - (3) initial type-testing of the product;
  - (4) initial inspection of factory and of factory production control;
  - (5) continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

### 3.2 Responsibilities

#### 3.2.1 Tasks of the manufacturer

##### 3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production (production of the retro-reflective foil on the basis of microprisms, transparent colour laminate, screen printing ink). All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. The factory production control shall ensure that the product conforms with this European technical approval.

<sup>7</sup> Official Journal of the European Communities L 254 of 08.10.1996

<sup>8</sup> Official Journal of the European Communities L 178 of 14.07.1999

The manufacturer may only use components stated in the technical documentation of this European technical approval. A quality control on the incoming materials bought and the material components respectively will be conducted before these can be used. The manufacturer shall only use materials and/or material components which are entered in the relevant documents of the receiving control according to the test plan.

The factory production control shall be in accordance with the "Control plan relating to the European technical approval ETA -10/0072 issued on 26 March 2010" which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.<sup>9</sup>

The results of the production control are recorded and evaluated. The records include, inter alia, the following information:

- Designation of the product, of the basic materials and of the components,
- Type of surveillance and check,
- Information on the production time frame of the products and time for testing the products and the materials and material components,
- Results of the surveillance and of the control and, if necessary, details for comparison with the requirements demanded,
- Signatures of the persons responsible for the factory production control.

The records shall be made available to the responsible inspection bodies during the continuous examination. On demand these shall be made available to Deutsches Institut für Bautechnik.

Details concerning extension, type and frequency of the controls and surveillance which are necessary in the context of factory production control shall be in conformity with the test plan which is part of the technical documentation of this European technical approval.

#### 3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve bodies which are approved for the tasks referred to in section 3.1 in the field of the micro-prismatic retro-reflective foils for traffic signs in order to undertake the actions laid down in section 3.2.2. For this purpose the test and "control" plan according to sections 3.2.1.1 and 3.2.2 shall be handed over to the approved bodies by the manufacturer.

#### 3.2.2 Tasks for the approved bodies

The approved bodies shall perform the following tasks in accordance with the provisions laid down in the control plan:

- Initial type-testing of the product,
- Initial inspection of factory and of factory production control,
- Continuous surveillance, assessment and approval of factory production control.

The approved bodies shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

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<sup>9</sup> The control plan is a confidential part of the European technical approval and only handed over to the approved bodies involved in the procedure of attestation of conformity. See section 3.2.2.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

### **3.3 CE marking**

The CE marking shall be affixed on the packaging or on the papers enclosed when delivering the product. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- The name and address of the producer (legal entity responsible for the manufacture),
- The last two digits of the year in which the CE marking was affixed,
- The number of the EC certificate of conformity for the product,
- The number of the European technical approval,
- Designation of the product "Nikkalite Crystal Grade (CRG) 92000 series with transparent colour film Acryl-Cal 100 series",
- Information on the product characteristics stated in section 1.2.

## **4 Assumptions under which the fitness of the product for the intended use was favourably assessed**

### **4.1 Manufacturing**

The European technical approval is issued for the product on the basis of agreed information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

### **4.2 Installation**

It is the task of the manufacturer to see to it that all persons involved will be informed about the Specific Conditions of this European technical approval.

The sign bases foreseen shall consist of aluminium or polycarbonate.

The use of the products is subject to national provisions.

The choice and the preparation of the sign support materials as well as the generally applicable rules on the bonding of the products "Nikkalite Crystal Grade CRG 92000 series with transparent colour film Acryl-Cal 100 series" which are fully described in the current versions of the publications and the technical documentation by the holder of the European technical approval, shall be observed taking account of the national provisions on the use of the product.

"Nikkalite Crystal Grade CRG 92000 series with transparent colour film Acryl-Cal 100 series" is equipped with a self-adhesive coating so that the foil can be glued on the sign support material which, at a room temperature of  $(20^{\circ}\text{C}\pm 2^{\circ}\text{C})$ , can be done with one of the following methods: mechanically driven roller applicator, manually operated roller applicator, application with a hand roller. If a heater assembly is used the sign support surface should be adjusted to a minimum temperature of  $18^{\circ}\text{C}$ .

The users are instructed to carefully check the qualification of the sign support material used as to its bonding property as well as to the durability qualification. "Nikkalite Crystal Grade CRG 92000 series with transparent colour film Acryl-Cal 100 series" was in particular developed for the bonding on flat surfaces. Processing defects which were caused by the choice of an unsuitable substrate or by an improper preparation, are not the responsibility of the holder of the European technical approval.

## **5 Indications to the manufacturer**

### **5.1 Packaging, transport and storage**

The foil should be stored in a cool, dry room at approximately  $22\text{ °C} \pm 2\text{ °C}$  and  $40\% \pm 10\%$  relative air humidity and should be processed within one year after the delivery. The rolls should be stored horizontally in the packaging carton on the roller supports. Rolls partially used should be replaced in the packaging and continued to be stored horizontally on the roller supports. In order to avoid an independent unwinding of the foil from the roll the foil should be fastened with adhesive tape. Foil sheets already fitted should be flatly stored only. Prepared signs should be stored indoors, standing on the edge. Finished signs should always be kept dry during storage and transport. Should these get wet, it shall be made sure that they will be dried as soon as possible. Colour laminates should be stored in a cool, dry room at approximately  $22\text{ °C} \pm 2\text{ °C}$  and  $40\% \pm 10\%$  relative air humidity and should be processed within one year after the delivery.

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Head of Section European Harmonisation  
of Deutsches Institut für Bautechnik  
Berlin, 26 March 2010

*beglaubigt:*  
Sterling