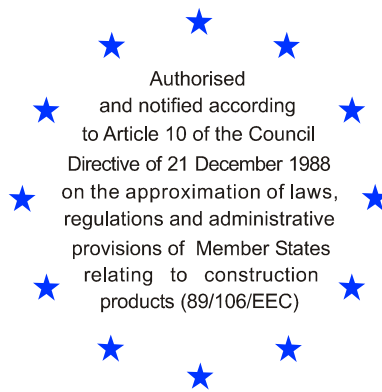


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DIBt

Mitglied der EOTA
Member of EOTA

European Technical Approval ETA-10/0069

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

Nikkalite Crystal Grade (CRG) Serie 92000, original gefärbt
Nikkalite Crystal Grade (CRG) Series 92000, originally dyed

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)
Manufacturing Department, Section V, CRG Manufacturing
Section, 530, Ojima, Namerikawa-shi, Toyama 936-8555,
Japan

Nikka Polymer Co., Inc. (Sano Factory)
Consolidated subsidiary of NCI Co., Inc, Head Office / Factory
17-3 Sakae-cho, Sano-shi, Tochigi 327-0816, Japan

Diese Zulassung umfasst
This Approval contains

15 Seiten
15 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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - 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 1998⁴, as amended by law of 31 October 2006⁵;
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

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 the types of which are stated 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	92802	foil thickness: 300 – 600µm dimension of the roll: 1200 mm x 45.7 m or customized dimensions
		yellow	92804	
		red	92805	
		blue	92806	
		green	92808	
		green 2 (dark green)	92828	

Table 1: Types of the reflective foil "Nikkalite Crystal Grade (CRG) 92000 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 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"

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"

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 β_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		
White	x	0.305	0.335	0.325	0.295	met	B2 ≥ 0.40
	y	0.315	0.345	0.355	0.325		
Yellow	x	0.494	0.470	0.513	0.545	met	B2 ≥ 0.24
	y	0.505	0.48	0.437	0.454		
Red	x	0.735	0.700	0.610	0.660	met	B2 ≥ 0.03
	y	0.265	0.250	0.340	0.340		
Green	x	0.110	0.170	0.170	0.110	met	B2 ≥ 0.03
	y	0.415	0.415	0.500	0.500		
Green 2	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	x	0.130	0.160	0.160	0.130	met	B2 ≥ 0.01
	y	0.090	0.090	0.140	0.140		

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	
White	x	0.475	0.360	0.392	0.515	met
	y	0.452	0.415	0.370	0.409	
Yellow	x	0.513	0.500	0.545	0.572	met
	y	0.487	0.470	0.425	0.425	
Red	x	0.652	0.620	0.712	0.735	met
	y	0.348	0.348	0.255	0.265	
Green	x	0.007	0.200	0.322	0.193	met
	y	0.570	0.500	0.590	0.782	
Green 2	x	0.007	0.200	0.322	0.193	met
	y	0.570	0.500	0.590	0.782	
Blue	x	0.033	0.180	0.230	0.091	met
	y	0.370	0.370	0.240	0.133	

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 Table 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 α , the incidence angle β , the rotation angle ε , and the orientation angle ω_s . In doing so, the viewing angle β was defined by its component β_1 , with $\beta_2 = 0$. The rotation angle ε and the orientation angle ω_s were also equated with 0.

Geometry of measurements		Colors/Code					
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Green 2	Blue
12'	+ 5°	250	170	45	45	20	20
	+30°	150	100	25	25	15	11
	+40°	110	70	15	12	6	8
20'	+ 5°	180	120	25	21	14	14
	+30°	100	70	14	12	11	8
	+40°	95	60	13	11	5	7
2°	+ 5°	5	3	1	0.5	0.5	0.2
	+30°	2.5	1.5	0.4	0.3	0.3	#
	+40°	1.5	1.0	0.3	0.2	0.2	#
met / not 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				
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue
0.1°	+ 5°	850	550	170	85	55
	+20°	600	390	120	60	40
	+30°	425	275	85	40	28
	+40°	275	175	55	25	18
0.2°	+ 5°	625	400	125	60	40
	+20°	450	290	90	45	30
	+30°	325	210	65	30	20
	+40°	200	130	40	20	13
0.33°	+ 5°	425	275	85	40	28
	+20°	300	195	60	30	20
	+30°	225	145	45	20	15
	+40°	150	95	30	15	10
met / not met		met	met	met	met	met

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

Geometry of measurements		Colors/Code				
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue
0.33°	+ 5°	300	195	60	30	19
	+20°	240	155	48	24	16
	+30°	165	110	33	17	11
	+40°	30	20	6	3	2
1.0°	+ 5°	35	23	7	3.5	2.5
	+20°	30	20	6	3	2
	+30°	20	13	4	2	1.5
	+40°	3.5	2	1	#	#
1.5°	+ 5°	15	10	3	1.5	1
	+20°	13	8	2.5	1	#
	+30°	9	6	2	#	#
	+40°	1.5	1	#	#	#
met / not met		met	met	met	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		Colour				
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue
0.1°	+ 5°	900	720	250	90	45
	+30°	495	405	135	45	22
	+40°	340	270	85	27	13
0.2°	+ 5°	720	600	195	75	40
	+30°	360	310	90	30	18
	+40°	180	155	45	15	7
0.5°	+ 5°	180	140	40	18	9
	+30°	90	75	23	9	4
	+40°	70	55	16	5	2.5
met / not met		met	not met	not met	met	met

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

Geometry of measurements		Colour				
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue
0.2°	+ 5°	400	300	80	45	20
	+30°	150	105	30	24	11
	+40°	45	35	9	7	3
0.33°	+ 5°	300	250	75	33	15
	+30°	130	90	30	18	7
	+40°	30	25	7	4	1.4
1.0°	+ 5°	70	55	13	8	3.5
	+30°	45	35	10	4.5	2
	+40°	13	10	4.5	1.8	#
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				
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue
0.2°	+ 5°	430	350	110	45	25
	+15°	350	270	90	35	20
	+30°	235	190	60	24	11
	+40°	55	40	12	7	3
0.33°	+ 5°	300	250	75	35	17
	+15°	250	200	65	25	15
	+30°	150	130	35	18	7
	+40°	30	25	7	4	2
1.0°	+ 5°	80	65	20	10	5
	+15°	60	45	16	7	3.5
	+30°	50	40	13	5	2.5
	+40°	15	13	5	2	1
met / not met		not met	not met	not met	not met	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 ε was determined in 25° steps from -75° 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
White	1.26	met
Yellow	1.35	met
Red	1.28	met
Green	1.77	met
Green 2	1.17	met
Blue	1.36	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	0.65 - 0.90	met
Red	0.20 - 0.35	met
Green	0.05 - 0.16	not met
Green 2	0.06 - 0.14	not met
Blue	0.05 - 0.10	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:

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.

Product	Colour	met / not met
Microprismatic reflective foil Nikkalite Crystal Grade (CRG) 92000 series	White 92802	met: There were no damages.
	Yellow 92804	
	Rred 92805	
	Green 92808	
	Green 2 92828	
	Blue 92806	

Table 12: Impact resistance

2.2.4 Durability of "Nikkalite Crystal Grade of the 92000 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"

The determination of the temperature resistance of "Nikkalite Crystal Grade CRG of the 92000 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 Nikkalite Crystal Grade (CRG) 92000 series	White 92802	1 [80 °C (± 2 °C)]
	Yellow 92804	
	Rred 92805	
	Green 92808	
	Green 2 92828	
	Blue 92806	

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		
White	x	0.355	0.305	0.285	0.335	met	B2
	y	0.355	0.305	0.325	0.375		≥ 0.40
Yellow	x	0.545	0.487	0.427	0.465	not met	B2
	y	0.454	0.423	0.483	0.534		≥ 0.24
Red	x	0.735	0.674	0.569	0.655	met	B2
	y	0.265	0.236	0.341	0.345		≥ 0.03
Green	x	0.007	0.248	0.177	0.026	met	B2
	y	0.703	0.409	0.362	0.399		≥ 0.03
Green 2	x	0.313	0.313	0.248	0.127	not met	B2
	y	0.682	0.453	0.409	0.557		0.01 - 0.07
Blue	x	0.078	0.150	0.210	0.137	met	B2
	y	0.171	0.220	0.160	0.038		≥ 0.01

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)
White	met
Yellow	met
Red	met
Green	met
Green 2	met
Blue	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 24.06.1996⁷, amended by the Decision 1999/453/EC⁸, 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 an 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 approved 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 for 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 is in conformity with this European technical approval.

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-10/0069 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.⁹

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

- Designation of the product, of the raw materials and of the components,
- type of surveillance and check,

⁷ Official Journal of the European Communities L 254 of 08.10.1996

⁸ Official Journal of the European Communities L 178 of 14.07.1999

⁹ 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.

- 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.

The approved bodies shall perform the following tasks in accordance with the provisions of 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.

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,
- 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 was issued for the product on the basis of agreed data/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 data/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 an additional 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" 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" 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 °C ± 2 °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 °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" 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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