PHU2K PHOTOLUMINESCENT PAINT SYSTEM

APPLICATION METHOD AND INFORMATION Version 2013

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1 DESCRIPTION

1.1 Main features

If lighting in a building/tunnel go out, our PHU2K photoluminescent paint can create visual signals by glowing in darkness during long hours.

Operating and reliability:
Phosphorescence is obtained when there is excitation of the component molecules, further to the exposure to any type of natural or artificial light. The phenomenom is not dangerous, non-radioactive and practically unalterable. If properly applied following our instructions, our photoluminescent paint doesn't almost show any transformation in terms of performance, light charging, luminance (intensity) and persistence (duration). Estimated lifetime : minimum 20 years.

Use
PHU2K phosphorescent paint is suitable for permanent applications, highly resistant, inside or outside. It's also suitable when specific requirement regarding a high fire resistance. Phosphorescent paints are not recommended for outdoors application as they need complete darkness to be fully efficient.

Appearance :
PHU2K phosphorescent paint has a bright, colourless, semi-transparent, and slightly green appearance. The colour emitted in a dark area is Green (strong intensity) or Turquoise (medium intensity). It's recommended to apply the paint over a white background for a maximum efficiency; a black background will reduce the glow.

Application :
Application is done in two successive stages: First the white background, then the phosphorescent paint. PHU2K paint is a finish: It doesn't need any clear coat, and is extremely resistant.

Composition :
Two-component polyurethane, very resistant UHS – VOCs <420g/L

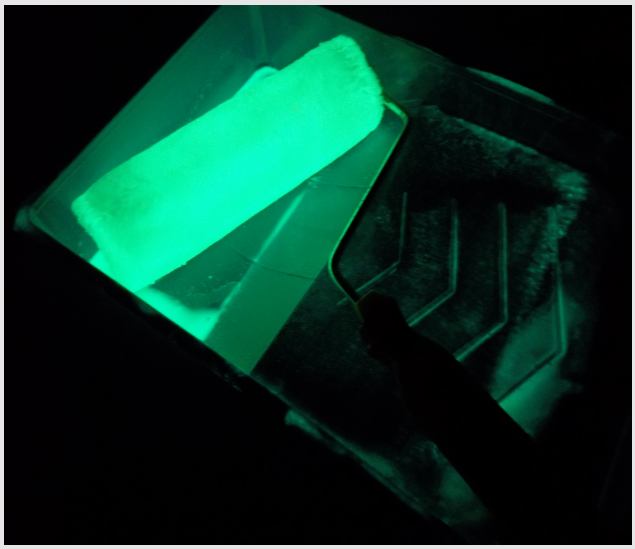
1.2 Substrate: preparation and primer

Depending on the painting supports (pre-lacquered metal, bare metal, concrete, plastic, wood...), the surface must be prepared carefully, and if needed, an adhesion promoter must be applied.

Paints	Slight sanding with P320, degreasing
Plastics	Depending on the type of plastic: Flaming treatment if possible, sanding using abrasive sponge + solvent, plastic primer application (BS230)
Ferrous metals	Degreasing, adhesion promoter and anticorrosive primer (AS801)
Non-ferrous metals	Degreasing, pickling, non-ferrous metal primer (Wash Primer)
Wood	Dusting off the surface, scraping, filler primer (NASA2000)
Concrete	Dusting off the surface, pickling if needed, EPOXY primer
Glass	Degreasing, glass/ceramic primer (POLYGLASS)

1.3 Pros and cons

Easy application	Less problems of sagging, excellent filling power, with roller or spraygun
Quick application	Primer (2 coats) and photoluminescent finish (3 passes) achieved in less than **3 h by 20°C**
Fast drying	Touch dry 1h – Dry to handle 24h
Excellent fire resistance	Application meets the different requirements of standard EN 45545 - 2, according to 3.1 : **See Statement**
High intensity luminance	Long remanence action and quick charging : **Luminance Class C/D (ISO 17398) : See Statement**
Unalterable phosphorescence	Lifetime exceeding 20 years
Compliance with legislation	Product compliant with solvent emission directive : VOCs <420 g/l.
Excellent resistance ***Top coating unnecesssary**	Friction, washing (NFX08-050-1) **See statement** Waterproof finish, anti-graffiti properties
Excellent adhesion	Flaking, bross-cut, stickers (NFX08-050-1) **See statement**
No maintenance needed	Simple Dusting / Washing
Harmfulness	Application to be carried out in the absence of public, in well ventilated areas



2 APPLICATION

The whole application process is divided in two steps (2 coats of primer + 3 coats of photoluminescent finish) and can be achieved in less than 3 hours. The surface painted may be used after 24h.

Note : Paints should be applied following the safety recommendations. Painters should wear special clothing, gloves and respiratory masks. Painting must be done in well ventilated places.

2.1 Surface preparation

Depending on the type of substrate (see 1.1)
Degreaser IP95 - Non-toxic, fast evaporation rate, does not leave residue.
Slight dry sanding with P320 to create adherence
Dusting, cleaning and degreasing with our degreasert IP95
Masked areas to protect

Degreaser IP95	Coverage performance: 4sqm/L

2.2 White background

See technical data sheet

We propose different types of white adhesion promoters or primers for all types of surfaces. Our white Alkyde AG703 primer is suitable for many substrates.
> White Alkyde AG703 primer + W20 synthetic thinner

Mixing: Thin to 10 to 20% if needed - **Paint mixture lifetime:** N/A
Application: pneumatic spray gun, in 2 coats with a 1 to 5 minutes interval
(1 thin pass to create adherence, then a more covering coat)
Drying: Interval before to cover with the phosphorescent finish: 25min «wet on wet». 8H max.

AG703 Primer	Coverage performance: 4sqm/kg
W19 Thinner	

2.3 PHU2K photoluminescent finish

See technical data sheet

Our PHU2K photoluminescent paint kits include :

1,33 L Kit	**4 L Kit**
1L of PHU2K paint	3L of PHU2K paint
0,33L of BS432 thinner	1L of BS432 thinner

Mixing (in volume)**:** **Paint mixture lifetime:** 20min at 20°C
– 100 parts of PHU2K
– 30 parts of thinner
Application: with pneumatic spray gun, directly over non sanded white primer, in 3 to 4 passes, with a 2 to 5mn interval, at 20°C
Drying: Dry to the touch in 1 to 2 h at 20°C - **Dry to handle:** 24h

PHU2K Kit	Coverage performance : 1,5sqm/kit

3 STANDARDS

3.1 Material fire behaviour EN 45545

Dangers caused by flame propagation, smoke opacity and toxicity

Our paint system is compliant with R1 and R3 requirements according to EN 45545
Tests:
(Settings: metal surfaces + 2 coats of primer + 3 passes of PHU2K finish)
Samples of paints applied on a 1mm steel plate, tested in laboratory

Statement* list according to the EN 45545-2 standard (COFRAC Accreditation) :

ISO 5658-2	Radiant panel test (determination of CFE value)
ISO 5659-2	Smoke generation horizontal method (test at 50 kW/sqm without the application of a pilot flame)
EN 45545-2	Appendix C Determination of CIT value, VOF4 and Ds density at 4 minutes
ISO 5660-1	Cone calorimeter at a level of 50 kW/sqm

Details of R1 requirement:

Product N°	Name	Details	Requirement
IN	Indoors		
IN1A	Interior vertical surfaces	Interior components (structure and coating) such as front, end and side walls, partitions, separations between rooms, hatches, panels/boxes, cowls, shutters. Interior doors, fill-in for front/end doors and external doors. Windows (including plastic and pane). Insulating material and inner surface of the frame structure Inside kitchen surfaces (except for kitchen equipments)	R1

Product N°	Name	Details	Requirement
IN1E	Exterior surfaces of speakers containing technical equipments.	Speakers located inside the box structure NOTE: Fire resistance requirements can apply to speakers containing technical equipments - see 4.2 and EN 45545-3	R1

3.2 Photoluminescent safety products and equipments

Luminance measurements, friction and washing resistance, tear resistance

3.2.1 Luminance test — NFX 08-050 - DIN 67510

Photoluminescent paints and systems are classified in terms of durability and luminance.

The minimum requirement in Europe is Class C, as defined by NF X 08-050-1.

Our PHU2K phosphorescent green paint allows to reach class C in 3 passes (3 x 30µm dry), and class D in 5 passes

Tests in laboratories according to Din 67510 :	**Test results**	
Duration	10min	60min
Class C standard measurements (ISO 17398)	140	20
Luminance value expressed in mcd/sqm with our samples	151	22

3.2.2 Adhesion test — NFX08-050-1 Ind. 11/11 §: 7.3.2.

PHOTOLUMINESCENT SAFETY SYSTEMS - PART 1 : GENERAL RULES _ Printing adhesion

Reference : PHU2K GREEN

Resultts	**See Statement**	Performed by SERCOVAM
No deterioration No erase nor significant transfer of signs identified by visual checking **Compliant**		

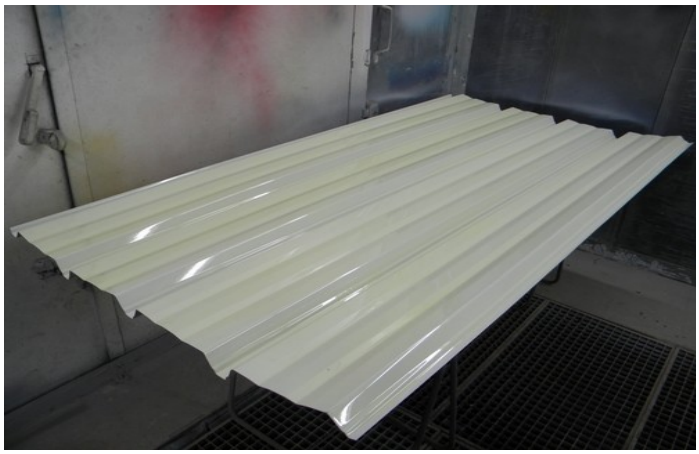
3.2.3 Friction test — CDC NFX08-050-1 (11/2011) §7.3.1

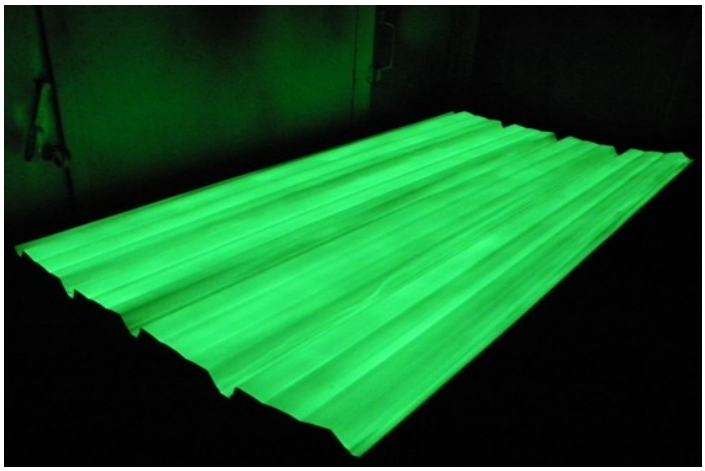
COLOUR RESISTANCE TO FRICTION

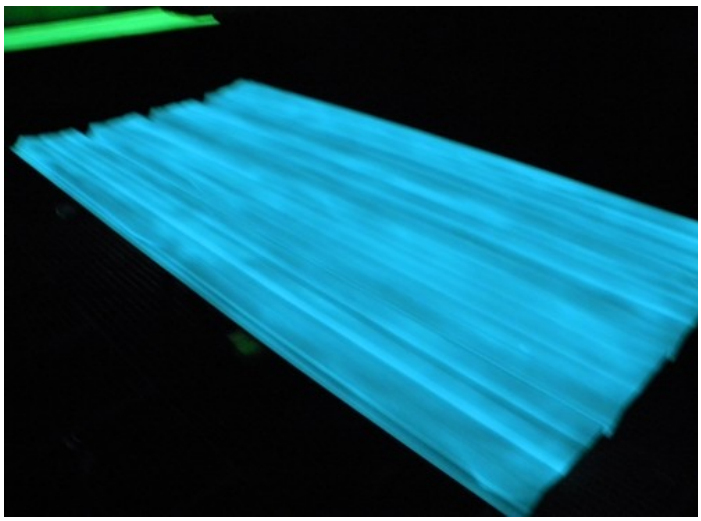
Reference : PHU2K Photoluminescent safety system GREEN 270713

Results	**See Statement**	Performed by SERCOVAM
Friction with isopropyl alcohol (15 cycles) No erase nor significant transfer of signs identified by visual checking No change in structure **Compliant**		

Photoluminescent paint PHU2K over siding – Appearance during the day/night– Green and Turquoise







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