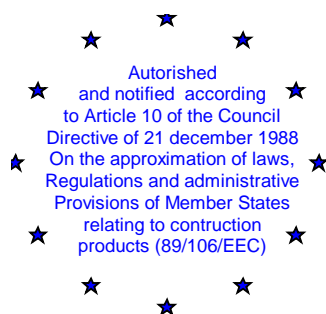


**INSTITUTO DE CIENCIAS DE
LA CONSTRUCCIÓN
EDUARDO TORROJA**

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**MIEMBRO DE LA EOTA
EOTA MEMBER**

EUROPEAN TECHNICAL APPROVAL

ETA – 10/0296

(English language translation, the original version is in Spanish language)

Nombre comercial:

Trade name:

IMPERMAX 2K

Beneficiario del DITE

Holder of approval:

KRYPTON CHEMICAL, S.L.

C/ Martí Franques nº 12. Pol. Ind. Les Tàpies
43890 L'HOSPITALET DE L'INFANT (Tarragona). España.

Área genérica y uso del producto de construcción :

Generic type and use of construction product:

Sistema de Impermeabilización de Cubiertas Aplicado en forma Líquida, basado en Poliuretanos

Liquid Applied Roof Waterproofing Kit, based on Polyurethane

**Validez de :
hasta :**

Validity from / to:

21 August 2010

21 August 2015

Plantas de fabricación:

Manufacturing plant:

C/ Martí Franques nº 12. Pol. Ind. Les Tàpies

43890 L'HOSPITALET DE L'INFANT (Tarragona). España.

El presente Documento de Idoneidad Técnica Europeo contiene:

10 páginas, incluyendo 1 anexo, el cual forma parte del documento

This European Technical Approval contains:

10 pages including 1 annex which form an integral part of the document



Organización Europea para la Idoneidad Técnica
European Organisation for Technical Approvals

I. LEGAL BASES AND GENERAL CONDITIONS

1. This European Technical Approval is issued by the **Instituto de Ciencias de la Construcción Eduardo Torroja** in accordance with:
 - Council Directive (89/106/EEC)¹ of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products, modified by the Council Directive 93/68/EEC of July 1993².
 - *Real Decreto 1630/1992 de 29 de diciembre, por el que se dictan disposiciones para la libre circulación de productos de construcción en aplicación de la Directiva 89/106/CEE³. REAL DECRETO 1328/1995, de 28 de julio, por el que se modifican, en aplicación de la Directiva 93/68/CEE las disposiciones para la libre circulación, aprobadas por el Real Decreto 1630/1992, de 29 de diciembre. (B.O.E. 19.895) y la Orden CTE/2276/2002 de 4 de septiembre.*
 - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC⁴.
 - Guideline for European Technical Approval of Liquid applied roof waterproofing kits, ETAG 005, edition 2000, Part 1 "General" and Part 6 "Specific stipulations for kits based on polyurethane".
2. The **Instituto de Ciencias de la Construcción Eduardo Torroja** is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant(s) (e.g. concerning the fulfilment of assumptions made in this European Technical Approval with regard to manufacturing). Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for intended use remains with the holder of the European Technical Approval.
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¹ Official Journal of the European Communities nº L 40, 11.2.1989, p.12

² Official Journal of the European Communities nº L 220, 30.8.1993, p.1

³ Boletín Oficial del Estado nº 34 de 9 de febrero de 01993.

⁴ Official Journal of the European Communities nº L 17, 20.1.1994, p.34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of product

The liquid applied roof waterproofing kit, based on polyurethane IMPERMAX 2K, manufactured by the company KRYPTON CHEMICAL, S.L., consists of a polyurethane resins, bi-component, elastomeric without internal protection layer; which once polymerised conforms an elastic lining, in form of a layer completely bonded to the support (concrete, mortar, ceramic, wood chipboard DMF and metal).

The minimum layer thickness of the assembled IMPERMAX 2K has to be 1,9 mm and the quantity consumed larger than 2 kg/m².

The kit contents a primer RAYSTON EPOXY 100 with a approximated consume of 0.3- 0,8 kg/m² depending to the support and external coat wit UV protection UV IMPERTRANS 60 (minimum consume 0,25 Kg/m²), when the kit is exposed to UV radiation.

The annex 1 shows the components and the system build-up of the system.

1.2 Intended use

The intended use of this System is the waterproofing of roof against the water, as in liquid as vapour form. This LARWK fulfils the Essential Requirements n° 2 (Safety in case of fire), n° 3 (Hygiene, health and the environment) and n° 4 (Safety in use) of the Construction products directive 89/106/EEC.

The performance levels of this System according to the Guide ETAG 005⁵ Part. 1 and Part. 6 are included in the annex 1. The provisions made in this European Technical Approval (ETA) are based on an assumed intended working life of the system of 25 years (W3).

The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are only to be regarded as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

"Assumed intended working life" means that, when an assessment following the ETAG provisions is made, and when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the Essential Requirements.

2. Characteristics of product and methods of verification

The assessment of the fitness of the liquid waterproofing kit IMPERMAX 2K for the intended use regard to the Essential Requirements n° 2, 3 and 4 was performed in compliance with the "Guideline for European Technical Approval of liquid applied roof waterproofing kits", ETAG 005, edition 2000, Part 1: General and Part 6: Specific stipulations for kits based on polyurethane.

2.1 Characteristics of System IMPERMAX 2K

2.1.1 ER. 2 Safety in case of fire

External fire performance. Classification: B_{roof}(t1) according EN 13501-5 for supports non-combustible with a roof pitches < 20° and NPD for combustible supports.

Reaction to fire. Euroclass F

⁵ ETAG N° 5, "Liquid applied roof waterproofing kits", Official Journal of the European Communities N° C 212/02, 06.09.2002.

2.1.2 ER. 3 Hygiene, health and environment

Resistance to water vapour (EN 1931). $\mu = 2.000$

Watertightness (EOTA TR-003). Watertight

Statement of dangerous substances. According to the manufacture's declaration taking account of the EU database, the product installed does not contain and release any dangerous substance.

Resistance to wind loads (EOTA TR-4). Pass (>50 kPa)

Resistance to dynamic indentation (EOTA TR- 6). Resistance Level: I₄

Resistance to static indentation (EOTA TR-7). Resistance Level : L₄

Resistance to fatigue movement (1.000 cycles) (EOTA TR-8). Pass

Resistance to low temperatures effects (-20°C). Dynamic indentation, Resistance Level: I₄

Resistance to high temperatures effects (90°C). Static indentation

T°C	Support	Load (N)	Resistance level
90° / 80° / 60°	Steel	250	L4
	Chipboard	250	L4

Resistance to heat ageing (EOTA TR-11). The samples are exposed to 80°C during 200 days.

Fatigue movement	pass
Dynamic indentation (-20°C)	I4
Tensile strength (MPa) (EN-ISO 527-3) (initial / ageing)	13 / 11
Tensile elongation (%) (EN-ISO 527-3) (initial / ageing)	184 / 203

Resistance to UV-radiation in the presence of moisture (EOTA TR- 10). The samples are exposed 5000 hours to UV-radiation.

Dynamic indentation (-10°C)	I4
Tensile strength (MPa) (EN-ISO 527-3)	13 / 13
Tensile elongation (%) (EN-ISO 527-3)	184 / 183

Resistance to hot water ageing (EOTA TR-12).The samples are kept in touch with water at 60°C over 60 and 180 days.

T°C	Ageing	Support	Load (N)	Resistance level
60° / 30°	180 d	Steel	250	L4
		Chipboard	250	L4
90° / 80°	60 d	Steel	250	L4
		Chipboard	250	L4

Resistance to wind loads Pass (>50 kPa)

Resistance to plant roots (EN 13948). NPD

2.1.3 ER. 4 Safety in use

Slipperiness. NPD

2.1.4 Related aspects of serviceability

Effect of weather conditions. The system does show changes in its tensile properties, when the system is assembled and cured under two temperature conditions of 0°C and 40°C, but these values obtained complied with the manufacturer's specifications (pass).

Effect of day joints. The delamination strength test performed on a layer assembled over other one, it shows a good delamination strength, being upper to required value of 50 kPa. (pass).

2.2 Identification of components

The characteristics of the components of this System show the following values, which compliance with their respective tolerances stated in the Manufacture Technical Dossier (MTD).

a.- Waterproofing liquid constituted by polioli and isocyanates, with loads and pigments mineral, and additives (anti-air entering, biocides, etc.). The main characteristics of this waterproof liquid are:

Properties	Component A	Component B
Density (g/cm ³) (ISO 1675)	1,07 ± 0,02	1,03 ± 0,02
Dry extract (105°C) (% weight) (EN 1768)	> 95	> 95
Ash content (450°C) (% weight) (EN 1879)	< 10	< 10
Viscosity (cps), (S63, 30 rpm, 25°C) (EN ISO 2555)	1200 ± 200	4000 ± 200

b.- Primer, RAYSTON EPOXY 100,

Properties	Component A	Component B
Density (g/cm ³) (ISO 1675)	1,11 -1,16	1,01-1,09
Dry extract (105°C) (% weight) (EN 1768)	> 90	> 90
Ash content (450°C) (% weight) (EN 1879)	< 10	< 10
Viscosity (cps), (S63, 30 rpm, 25°C) (EN ISO 2555)	500 – 700	280 ± 60

c- IMPERTRANS 60. External protection. Aliphatic Polyurethane resins.

Properties	Component
Density (g/cm ³) (ISO 1675)	0,94- 0,98
Dry extract (105°C) (% weight) (EN 1768)	> 50
Ash content (450°C) (% weight) (EN 1879)	40-45

3 Evaluation of Conformity and CE marking

3.1 Attestation of Conformity System

The European Commission according to her decision (98/599/EC of October 1998, Official Journal of the European Communities N° L 287, 24.10.1998) on the procedure of attestation of conformity has laid down for this type of material

System 3

for the procedure of attestation of conformity (Annex III, clause 2(ii) second possibility of Directive 89/106/EEC) for liquid applied roof waterproofing kits. According to this decision, system 3 of Attestation of Conformity also applies with regard to external fire performance.

The system 3 provides:

- a) *Tasks for the manufacturer:* Factory production control.
- b) *Tasks for the approved body:* Initial type-testing of the product.

3.2 Responsibilities

3.2.1 *Tasks for the manufacturer*

3.2.1.1 Factory production control

The manufacturer exercises a permanent internal control of production and assures that the obtained results fulfil the quality level demanded. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This control production system documentation ensures a common understanding of quality assurance and enables the achievement of the required product characteristics according to the Technical European Approval.

The manufacturer shall only use incoming materials supplied with the relevant inspection documents according to the MTD.

The results of the factory production control shall be recorded and evaluated in accordance with the provisions of the "control plan"⁽⁶⁾. The records shall include at least the following information:

- Name of the product and of the initial materials,
- type of inspection or control,
- date of manufacture of the product, batch N° if needed, and date of inspection or control of the product or of the initial materials,
- result of inspections or controls and, as far as applicable, comparison with the requirements,
- signature of the person responsible for the factory production control.

The records shall be kept for at least five years. Further information concerning test, frequency and tolerance are included in the control plan, which is part of the MTD to this ETA placed at IETcc.

3.2.1.2 Other tasks of the manufacturer

For initial type – testing, the results of the tests performed as part of the assessment for the ETA shall be used unless there are changes in the production line or plant. In such cases the necessary initial type- testing has to be agreed with the IETcc.

The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 3.1 in the field of the product in order to undertake the actions laid down in the clause 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 shall be handed over by the manufacturer to the notified bodies involved.

⁶ The control plan is a confidential part of the European Technical Approval and only handed to the notified body involved in the procedure of attestation of conformity. The control plan has been agreed between the manufacturer and de IETcc and it is laid down in the context of the MTD and deposited at the IETcc

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this ETA.

3.2.2 *Tasks for the Approved Body*

3.2.2.1 Initial type-testing of the product

The initial type-testing have been conducted by the IETcc to issued this ETA in accordance with chapter 5 of the guideline "Liquid applied roof waterproofing kits" (ETAG 005) part 1 and 6.

The verifications underlying this ETA have been furnished on samples from the current production; these will replace the initial type-testing carried out by the manufacturer.

The IETcc has assessed the results of these tests in accordance with chapter 6 of this ETA –Guideline, as part of the ETA issuing procedure.

3.3 **CE marking**

The CE marking⁷ shall be affixed on the pot of the kit of the roof waterproofing IMPERMAX 2K. The different components are marked as belong to the IMPERMAX 2K kit.

In addition to the symbol "CE" the following information shall be given:

- name or identifying mark of the manufacturer and of the factory,
- short definition of the levels of performance (ETAG 005-8), according to annex 1,
- the last two digits of the year in which the CE marking was affixed,
- number of the European technical approval,
- number of the European technical approval Guideline,

4 Assumptions under which the fitness for use of the product for the intended use was favorably assessed

4.1 Manufacture

Further information about the manufacturing of the kit is laid down in the MTD placed at IETcc.

This ETA is issued for the kit IMPERMAX 2K on the basis of the product composition deposited at IETcc. Changes to the components of the kit or in the production process of the components, which could result in the production process and/or the properties of the product deposited being incorrect should be notified to IETcc before the changes are introduced. IETcc will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if further assessment/alterations to the ETA shall be necessary.

This approval may be extended with other requirements applicable to dangerous substances resulting from transposed European legislation or applicable national regulations and administrative provisions.

Besides, this approval may be extended with other requirements applicable to the products resulting from other applicable national regulations and administrative provisions.

These requirements need also to be complied with.

⁷ Notes on the CE marking are stated in Guidance Paper D "CE marking under the Construction Products Directive", Brussels 01 August 2002.

4.2 Design

In the MTD the manufacture gives information on the quantities consumed and the processing, which shall lead to a thickness of the roof waterproofing of at least 1.9 mm.

4.3 Installation

The fitness of use of this kit can only be assumed if this is installed according to the manufacturer's instructions, which are part of the MTD to this ETA placed at IETcc.

Particularly, it is recommended to consider:

- The kit installation has to be carried out by qualified installers,
- it can only be used the components of the kit indicated in this ETA,
- the supervision of the amount of material used (kg/m^2) and the control visual to check that each coat covers totally the one below, can ensure the minimum thickness of the kits,
- inspection of the roof surface (cleanliness and correct preparation) before applying the roof waterproofing,
- IMPERMAX 2K is applied by projection device in heat, with the following characteristics: Pressure 150 bar, Deposit temperature product 70°C , temperature product conduct 65°C .

Before, the installation of IMPERMAX 2K, it is recommended to read its security card.

4.4 Manufacturer's responsibilities

It is the responsibility of the manufacturer of the product to ensure that the information on all provisions is given to those concerned.

5 Information by the manufacture

5.1 Recommendations on packing, transport and storage

This product is considered noxious/ irritating, so it is necessary to follow the security instruction for transport and handle.

The storage must be done at temperatures between 0°C - 45°C , in dry conditions and protected against the sun radiation.

The product must be used 1 year after manufacturing date. Further installation details are laid down in the MTD place at IETcc.

5.2 Recommendations on use, maintenance and repair

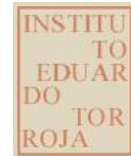
In those roofs with deteriorated areas of the waterproof layers, they will be repaired removing all the deteriorated layers. Afterwards, the new product will be assembled following the installation instruction and the new coats must overlap, at least 3 cm, to the coat not deteriorated.

Further installation details are laid down in the MTD place at IETcc.



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On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja

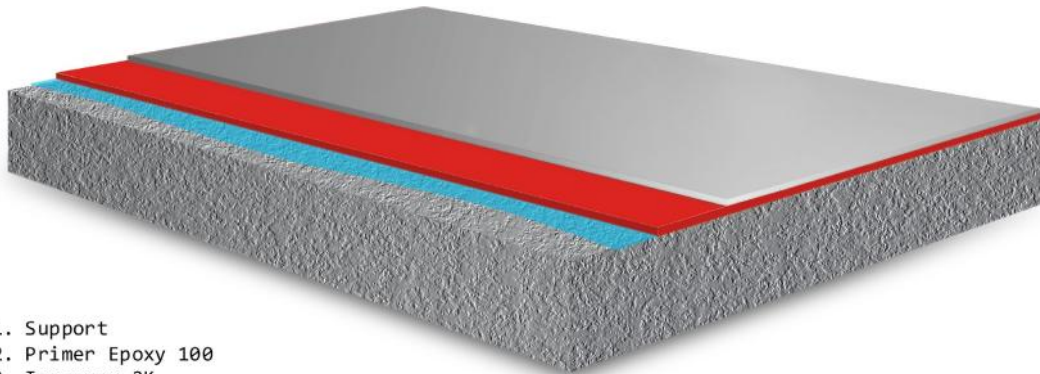
Madrid, 21 August 2010

**EL DIRECTOR DEL INSTITUTO DE CIENCIAS
DE LA CONSTRUCCIÓN EDUARDO TORROJA**

Víctor R. Velasco Rodríguez.

Annex 1. System build-up of the roof waterproofing IMPERMAX 2K

IMPERMAX 2K SYSTEM



1. Support
2. Primer Epoxy 100
3. Impermax 2K
4. Finish:Impertrans

Characteristics of the System IMPERMAX 2K

Minimum thickness	1.9 mm
Water vapour diffusion resistant factor	$\mu \approx 2.000$
Resistance to wind loads	> 50 kPa
Resistance to plant roots	NPD
Statement on dangerous substances	Not contain
Resistance to slipperiness	NPD

Performance levels according to the intended use

External fire performance	Broof (t1) for supports non-combustible with a roof pitches < 20° NPD for combustible support
Fire reaction	F
Expected working life	W3
Climatic zone of use	S
User loads	P4
Roofs slopes	S1 – S4
Minimum surface temperatures	TL3
Maximum surface temperatures	TH4