INSTITUTO DE CIENCIAS DE LA CONSTRUCCIÓN EDUARDO TORROJA

C/ Serrano Galvache nº 4
28033 Madrid

Tel.: (34) 91 302 04 40
Fax: (34) 91 302 07 00
director@ietcc.csic.es
www.ietcc.csic.es

Autorished and notified according to Article 10 of the Council Directive of 21 december 1988 On the approximation of laws, Regulations and administrative Provisions of Member States relating to contruction products (89/106/EEC)

MIEMBRO DE LA EOTA
EOTA MEMBER

EUROPEAN TECHNICAL APPROVAL ETA – 06/0263

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

Nombre comercial: Trade name:	**IMPERMAX**
Beneficiario del DITE Holder of approval:	**KRYPTON CHEMICAL, S.L.** **C/ Martí Franques nº 12. Pol. Ind. Les Tápies** **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:	**30 de Septiembre de 2010** **5 de diciembre de 2011**
Plantas de fabricación: Manufacturing plant:	**C/ Martí Franques nº 12. Pol. Ind. Les Tápies** **43890 L´Hospitalet de l´infant. Tarragona, España.**
El presente Documento de Idoneidad Técnica Europeo contiene: This European Technical Approval contains:	**13 paginas, incluyendo 1 anexo, el cual forma parte del documento** 13 pages including 1 annex which form an integral part of the document
Este Documento de Idoneidad Técnica sustituye: This European Technical Approval substitutes	**DITE 06/0263 con validez del 5-12-2006 hasta 5-12-2011** ETA 06/0263 with validity from 5-12-2006 until 5-12-2011

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) of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[(1)], modified by the Council Directive 93/68/EEC of July 1993[(2)] and Regulation (EC) nº 1882/2003 of the European Parliament and of the Council[(3)].

   - *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/CEE[(4)]. 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/EC[(5)].

   - 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). 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.

3. This European Technical Approval is not to be transferred to other manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those laid down in the context of this European Technical Approval.

4. This European Technical Approval may be withdrawn by the ***Instituto de Ciencias de la Construcción Eduardo Torroja*** pursuant to Article 5.1 of the 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 the ***Instituto de Ciencias de la Construcción Eduardo Torroja***. 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 to the version circulated within EOTA. Translations into other languages have to be designated as such.

---

[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] Official Journal of the European Communities nº L 284, 31.10.2003, p.25
[4] Boletín Oficial del Estado nº 34 de 9 de febrero de 01993.
[5] 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”, manufactured by the company KRYPTON CHEMICAL, S.L.., consists of a polyurethane resins, mono-component, elastomeric with or without internal protection layer; which once polymerised conforms an elastic lining, in form of a layer completely bonded to the support (concrete, mortar, ceramic and polyurethane foam).

This kit can be used for different working life depending mainly of this thickness:

- 1,4 mm, quantity consumed of 1,6 kg/m^2 for a 10 years working life. This kit can be finalized with an external layer of COLODUR (minimum consume of 300 g/m^2) for a load category of P3.
- 1,6 mm, quantity consumed larger than 2 kg/m^2 for a 25 years working life.
- 2,2 mm with internal reinforcement (GEOMAX), quantity consumed larger than 3 kg/m^2 for a 25 years working life,

The kit contents a primer RAYSTON EPOXY 100 with a approximated consume of 0.3-0,8 kg/m^2 depending to the support and a accelerant product (SUPER ACELERANTE RAYSTON) which is mixed with IMPERMAX (5% in weight).

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 nº 2 (Safety in case of fire), nº 3 (Hygiene, health and the environment) and nº 4 (Safety in use) of the Construction products directive 89/106/EEC.

The performance levels of this System according to the Guide ETAG 005[6] 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 10 years (W2) and 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 for the intended use regard to the Essential Requirements nº 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.

According to manufacture’s declaration, the components polymerised of the system IMPERMAX does not contain dangerous substances defined in the EU database (Security card, according to national disposition, placed at IETcc).

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

This ETA is issued for the kit “IMPERMAX” 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.

2.1 **Characteristics of System “IMPERMAX”**

2.1.1 *ER. 2 Safety in case of fire*

External fire performance. Broof (t1) for supports according to point 1.1, except for the polyurethane foam support that the classification is NPD.

Reaction to fire. Euroclass F: NPD

2.1.2 *ER. 3 Hygiene, health and environment*

Resistance to water vapour (EN 1931). μ > 1.000

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). I4

Resistance to static indentation (EOTA TR-7)

Consume	Substrate	Level of resistance
≥ 2 kg/m^2	Steel	L4
	Polyurethane foam	L3
1,6 kg/m^2	Steel	L3

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

Resistance to low temperatures effects (-20ºC). Dynamic indentation I_4

Resistance to high temperatures effects. Static indentation

Without Internal reinforcement (2 kg/m²)

Maximun surface temperature	Substrate	Level of resistance
90ºC	Steel	L2
	Polyurethane foam	L1
80ºC	Steel	L3
	Polyurethane foam	L1
60ºC	Steel	L4
	Polyurethane foam	L1

With Internal reinforcement (3 kg/m²)

Maximun surface temperature	Substrate	Level of resistance
90ºC / 80ºC	Steel	L3
60ºC	Steel	L4

1.6 kg/m² with and without COLODUR

Maximun surface temperature	Substrate	Level of resistance With COLODUR	Level of resistance
90ºC	Steel	L2	L1
80ºC / 60ºC	Steel	L3	L3

Resistance to heat ageing (EOTA TR-11). The samples are exposed to 80ºC during 100 (W2) and 200 (W3) days.

Tests	*2 Kg/m²*	*3 kg/m²* + reinforcement	1,6 Kg/m²	1,6 Kg/m² + COLODUR
Working life	W3	W3	W2	W2
Fatigue movement	Pass	Pass	Pass	Pass
Dynamic indentation (-20ºC)	I4	I4	I4	I4
Tensile strength (MPa) (EN-ISO 527-3) (initial/ageing)	2,4 / 3,3	5,8 /5,6	3,5 / --	3,5 / --
Tensile elongation (%) (EN-ISO 527-3) (initial/ageing)	459 / 192	40 / 48	694 / --	512 / --

Resistance to UV-radiation in the presence of moisture (EOTA TR- 10). The samples are exposed 5.000 (W3) hours to UV-radiation.

Tests	*2 Kg/m²*	*3 kg/m²* + malla
Working lifel	W3	W3
Dinamic identation (-20ºC)	I4	I4
Tensile strength (MPa) (EN-ISO 527-3)	2,4 / 3,1	5,8 / 6,6
Tensile elongation (%) (EN-ISO 527-3)	459 / 193	40 / 46

Resistance to hot water ageing (EOTA TR-12). The samples are kept in touch with water at 60ºC over 30 (W2) and 60 (W3) days.

Delamination strength (kPa) (Concrete): Apt (> 50 KPa)
Static indentation :

Without Internal reinforcement (2 kg/m^2)(W3)

Maximun surface temperature	Substrate	Level of resistance
90ºC	Steel	L2
80ºC	Steel	L3
60ºC	Steel	L4

With Internal reinforcement (3 kg/m^2)(W3)

Maximun surface temperature	Substrate	Level of resistance
90ºC / 80ºC	Steel	L3
60ºC	Steel	L4

1.6 kg/m^2 with and without COLODUR

Maximun surface temperature	Substrate	Level of resistance With COLODUR	Level of resistance
90ºC	Steel	L2	L1
80ºC	Steel	L3	L2
60ºC	Steel	L3	L3

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 0ºC and 40ºC, 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 compliance with their respective tolerances stated in the Manufacture Technical Dossier (MTD).

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

Density (g/cm³), (ISO 1675)	1,3 –1.4 g/cm^3
Dry extract (105ºC), (% weight) (EN 1768)	> 82 %.
Ash content (450°C), (% weight) (EN 1879)	29-35 %.
Viscosity (cps), (EN ISO 2555)	2.000 –4.000 cps

- Accelerant agent (SUPER ACELERANTE RAYSTON). Concentrate of amines and dissolvent.

Density (g/cm³), (ISO 1675)	0,8 –1 g/cm^3
Viscosity (cps), (EN-UNE ISO 2555)	< 100 cps

- Geotextil non-woven (Geomax), with the following characteristics.

Weight per surface unit (gr/ m^2) EN 29073-1	≥ 80
Thickness (mm) EN 29073-2	0,65
Tensile strength Longitudinal (kN) EN ISO 10319	≥ 1,5
Tensile strength Transversal (kN) EN ISO 10319	≥ 4
Elongation Longitudinal (%) EN ISO 10320	≥ 90
Elongation Transversal (%) EN ISO 10321	≥ 90
Identation Resistance (kN) EN ISO 12236	≥ 0,50

- External Protection *COLODUR*. Aliphatic Polyurethane resins mono-component.

Propiedades	**Componente**
Density (g/cm³) (ISO 1675)	0,92 – 0,98
Dry extract (105ºC) (% weight) (EN 1768)	58 - 70
Ash content (450°C) (% weight) (EN 1879)	< 1

- Primer RAYSTON EPOXY 100.

Properties	**Component A**	**Component B**
Density (g/cm³) (ISO 1675)	1,11 -1,16	1,01-1,09
Dry extract (105ºC) (% weight) (EN 1768)	> 90	> 90
Ash content (450°C) (% weight) (EN 1879)	< 10	< 10
Viscosity (cps), (S63, 30 rpm, 25ºC) (EN ISO 2555)	500 – 700	220 - 340

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. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this Technical European Approval.

The manufacturer shall only use incoming raw materials stated in the MTD. He shall inspect and control the raw material on acceptance with the MTD.

The results of the factory production control shall be recorded and evaluated in accordance with the provisions of the "control plan"[7]. The records shall include at least the following information:

- Designation of the product, the basic materials and components,
- 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 basic materials and components,
- 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.

[7] 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 1and 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 marking[8] shall be affixed on the pot of the kit of the roof waterproofing "IMPERMAX".

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 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 Guideline for the European Technical Approval,

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

4.1 **Manufacturing**

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

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 the indicated in point 1.1.

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 carried out by qualified installers,
- it can only be used the components of the kit indicated in this ETA,

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

- the supervision of the amount of material used (kg/m^2) and the control visual to check that each coat cover 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,
- the recommended temperature of the product to be assembled will be between 0ºC and 40ºC and it will be not admitted support temperatures upper to 45ºC. In other conditions it will need to follow the manufacturer's instructions.

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

4.4 **Manufacturer's responsibilities**

It is 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 inflammable, so it is necessary to follow the security instruction for transport and handle.

The storage must be done at temperatures between 15ºC - 30ºC, in dry conditions and protected against the sun radiation.

The product must be used 1 year after manufacturing date. Once the pot is opened, the product cannot be maintained in the original recipient. It is recommended to change the rest in a new pot of less size, with an hermetic top, and placing in a inverted position.

Further installation details are laid down in the MTD placed 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 no deteriorated.

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

Instituto de Ciencias de la Construcción Eduardo Torroja
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS
c/ Serrano Galvache nº4. 28033 Madrid. Tel: (34) 91 302 04 40 Fax. (34) 91 302 07 00
www.ietcc.csic.es

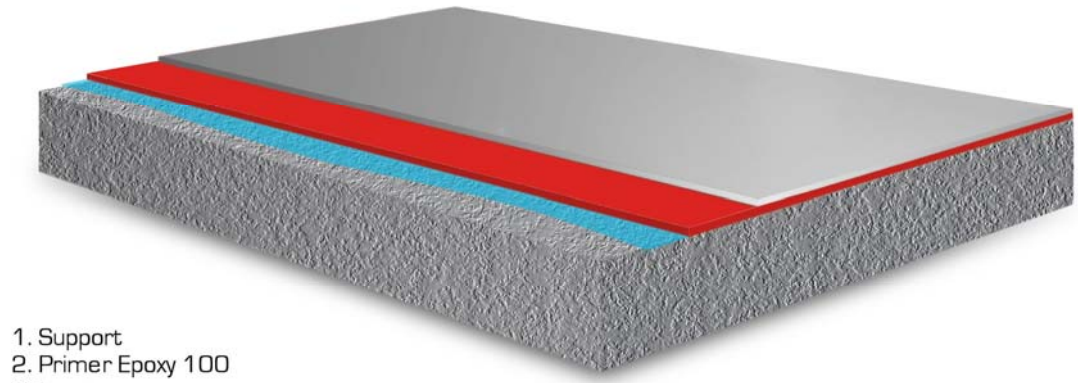
On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja

Madrid, 30 September 2010

EL DIRECTOR DEL INSTITUTO DE CIENCIAS
DE LA CONSTRUCCIÓN EDUARDO TORROJA

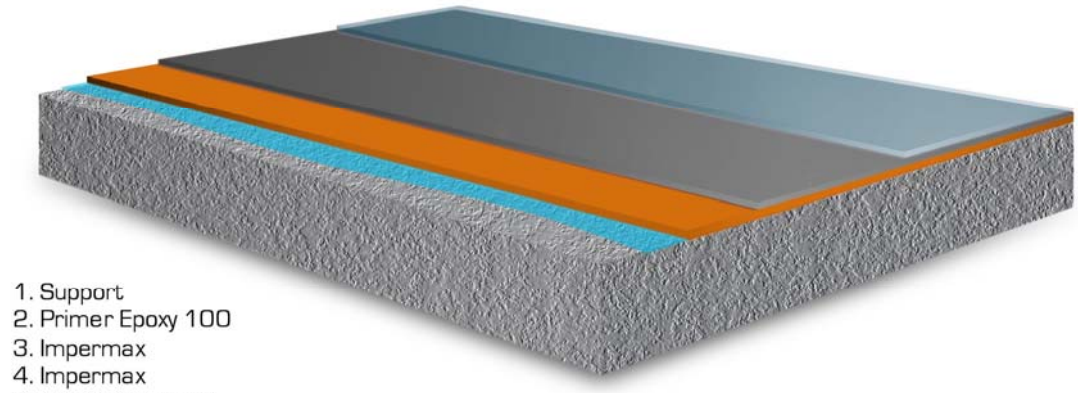
Víctor R. Velasco Rodríguez

Annex 1. *System build-up of the roof waterproofing "IMPERMAX"*



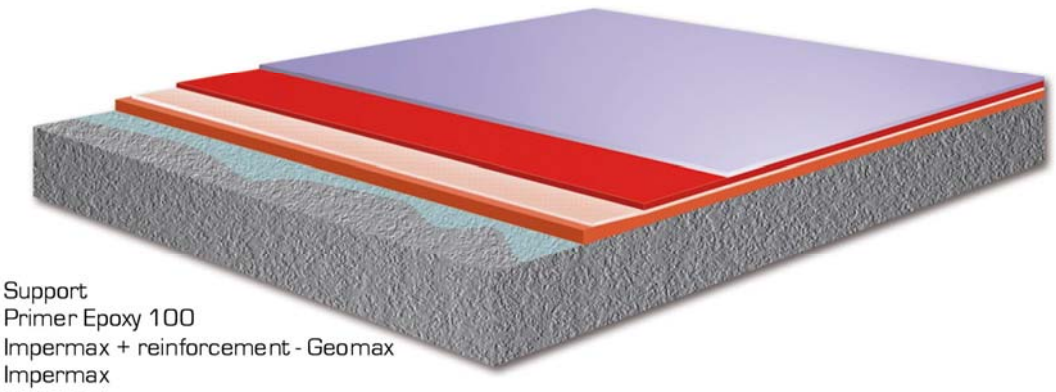
1. Support
2. Primer Epoxy 100
3. Impermax
4. Impermax

Impermax System 1,6 kg/m2 + finish topcoat



1. Support
2. Primer Epoxy 100
3. Impermax
4. Impermax
5. Topcoat Colodur

IMPERMAX System 3kg/m2 + Reinforcement Geotextil



1. Support
2. Primer Epoxy 100
3. Impermax + reinforcement - Geomax
4. Impermax
5. Impermax

Characteristics of the System “IMPERMAX"

Minimum thickness	1,4 mm (W2) 1.6 mm (W3) 2.2 mm (W3) with reinforcement
Water vapour diffusion resistant factor	μ = 1.485
Resistance to wind loads	> 50 KPa
Resistance to plant roots	NPD
Statement on dangerous substances	No contiene
Resistance to slipperiness	NPD

Performance levels according to the intended use

	1,6 kg/m^2 (1,4 mm)	**1,6 kg/m^2 + COLODUR**	**2 kg/m^2**	**3 kg/m^2 + malla**
External fire performance	Broof (t1)	Broof (t1)	Broof (t1)	Broof (t1)
Reaction to fire	F	F	F	F
Working life	W2 (10 years)	W2 (10 years)	W3 (25 years)	W3 (25 years)
Climatic zone	S (Severe)	S (Severe)	S (Severe)	S (Severe)
User load	P3: TH2 P2: TH3 P1:TH4	P3: TH2 P3: TH3 P2:TH4	P3: TH2 P3: TH3 P2:TH4	P3: TH2 P3: TH3 P3:TH4
Roof slope	S1 – S4	S1 – S4	S1 – S4	S1 – S4
Minimun surface temperature	TL3 (- 20 ^{0}C)	TL3 (- 20 ^{0}C)	TL3 (- 20 ^{0}C)	TL3 (- 20 ^{0}C)
Maximun surface temperature	TH4 (90ºC) TH3 (80ºC) TH2 (60ºC)	TH4 (90ºC) TH3 (80ºC) TH2 (60ºC)	TH4 (90ºC) TH3 (80ºC) TH2 (60ºC)	TH4 (90ºC) TH3 (80ºC) TH2 (60ºC)

NOTE: The user load levels and the External fire performance classification in this table are for support of concrete and steel. For a polyurethane foam support, the system has been only test for a working life of 10 years (W2) and 2 2kg/m^2 of IMPERMAX, with a User load of P1.

HBP HIGH BUILDING PROTECTION
DIRECTION GÉNÉRALE
Jonquet Face MTN Internet
Tél.: (+229) 21 33 33 48
95 96 00 08
04 B P : 0526 Cotonou
contact@hbpbenin.com
www.hbpbenin.com
DIRECTION COMMERCIALE
HBP New City
Maro Militaire à coté de Toxi Lobo
Tél.: (+229) 21 32 48 48
95 02 72 72 - 94 00 61 61