Max Perlès

advanced industrial coatings

technical manual
waste water & desalination

BIOPERL systems

Max Perlès

Waterproof , Watertight and Protective coatings

WASTE WATER & DESALINATION
and *max perlès* ***BIOPERL®***
coatings for treatment and storage works

Why waste water and desalination works should be protected :

Optimized Asset Management :

To prevent or to stop the degradation of infrastructure, hence significantly increasing its life expectancy and operating period, therefore generating a *positive return on the investment in the coating.*

Functionally :

- on a concrete substrate : to obtain a *waterproof* or *watertight* surface that can furthermore *resist certain degrees of cracking in a concrete substrate* as well as *counter-pressure* through the concrete . The coating is either single-coat , « watertight « , resisting future cracking in the substrate of up to 2/10ths of a mm , or is a waterproof composite of epoxy resin reinforced with glass tissue or mat , that will resist future cracking in the substrate of up to 20/10ths of a mm , depending on the weight of the glass reinforcement used .
- on a steel substrate : to apply an anti-corrosion and protective film to the steel surface.

Technically :

- To *protect municipal and industrial waste water treatment plants and installations from premature degradation* due to the various agressive gases waste water emits , and notably hydrogen sulphide (H2S) .
- To *protect desalination plants from premature degradation* due to the detrimental impact on concrete and steel of prolonged contact with salt water .
- To greatly *facilitate and accelerate cleaning and maintenance operations* due to the smooth finish of the coating .
- To conform with toxicological and sanitary regulations applicable in most countries

Advantages of max perlès coatings :

Health and Safety :

They are ***solvent-free*** and made of ***non-toxic and non-polluting substances*** . This ***protects the environment*** and allows them to be applied under *health and safety conditions* vital for both the personnel involved and the quality of the implementation. In particular , they ***contain no carcinogenic or mutagenic substances or substances that are toxic to reproduction (CMRs) (except for CHEMPERL).***

Experience and references :

They are the result of unmatched expertise and experience : our solvent-free epoxy *coatings* for the protection of waste water treatment plants have been implemented by qualified applicators on worksites worldwide *since 1965*.

Quality Assurance :

Our Research & Development and Technical Assistance Departments work in collaboration to develop our products' reliability, as well as to fine-tune new products, for a quality that we strive to always improve – *a must for ISO 9001-2015 certification* – to better meet the users' expectations and those of an *environment* more and more strictly governed by *regulations*.

Technical Assistance :

Our Technical Assistance department offers upon request training or advice to application companies by assisting them before and/or during their work. It also operates post-application visits upon request by the Applicator or the end customer to detect possible defects.

Independent Testing :

Our coatings are tested by certified laboratories . Test results are available on request .

Guaranteed reliability :

Max Perlès coating systems are guaranteed for the duration indicated on the specification supplied for each project . This guarantee is based on a specific *Insurance Policy* issued by a world-class Insurance Company . Our Application partners , once trained by us , should supply a similar guarantee on their workmanship . The end customer can then request from the manufacturer/applicator partnership a *Joint Guarantee* indicating that any failure of the coating during the warranty period resulting from bad product quality or its incorrect application will be corrected free of charge for the client.

UPWARDS OF 10 MILLION SQM OF CAPACITIES HAVE BEEN PROTECTED WITH OUR PRODUCTS OVER THE LAST 60 YEARS.

Max Perlès

Waterproof , Watertight and Protective coatings

Foreword : Applicable Norms , Rules and Regulations

Summary

Appendix 1

CEBTP test report

CE marking and Performance Declaration

Origin of the products

Appendix 2

Product data sheets

Appendix 3

Technical advices n°1, 2, 3, 4, 5, 7, 14 and 21

Appendix 4

Reference list

Max Perlès

Waterproof , Watertight and Protective coatings

Foreword : Applicable Norms , Rules and Regulations

Concrete substrates

Fascicule 74
NF EN 1992-1 Chapter 7.3.1
NF EN 1992-3 Chapter 7.3.1 (EUROCODE N°2 – silos and reservoirs)
NF EN 206
DTU 65
DTU 14.1
DTU 56
NF EN 1504-2

Steel substrates

AFNOR ICS 82 Paints and Varnishes

NF T 36-001: Technical Dictionnary of Paints and Paintwork
ISO 12944 : applicable to new work only
NF EN ISO 3450
ISO -8501-1-2& 3
ISO 8502 -1-2-3-4 & 5

Bibliography

ITBTP Publications : « Recommandations professionnelles Mai 1990 « (how to calculate and implement waterproofing to reservoirs , basins and tanks , whether overground or underground , open or closed)

OHGPI : Circulars G32 & G37

Laboratoire de Recherche des Monuments Historiques : visible alterations in concrete , diagnosis

SETRA /LCPC : Choice and implementation of products for the repair and protection of concrete

French Civil Works Association : November 2003 - Rehabilitation of degraded concrete

GESIP –UIC-UFIP : Catalog and classification of Civil Works disorders (SEVESO III retentions)

It is the application company's responsibility to respect all the rules and regulations applicable in the country where the work is carried out .

1. Uses of BIOPERL® systems

BIOPERL® systems are epoxy coatings based on thermo-hardening polymers , containing no solvents , presented in pre-dosed kits of two separate components (a base and a hardener) , to be applied *in situ* , in one or more coats , inside the different parts of Municipal and Industrial Waste Water Treatment Plants and Desalination Plants , on B & C class concrete or steel substrates . The standard topcoat finish of BIOPERL® T will be replaced by a vinylester CHEMPERL VE-T topcoat or by a novolac-epoxy GELCOAT SV101 topcoat in certain chemical environments .

Main Uses :

BIOPERL® systems supply an interior , watertight protective coating to the different components of Municipal and Industrial Waste Water Treatment Plants and Desalination Plants - reservoirs , storage and clarification basins , retention pits , gutters , vats , vessels , digesters , thickeners , desanding pools , settling and flocculation tanks etc.… – whether they contain municipal waste water , industrial waste water , salt water , brackish water or other aggressive waters , industrial liquids up to 95 °C , agressive gases such as H2S and methane , base or acid reagents etc.…

They therefore apply to both concrete and steel works , whether new or being rehabilitated or repaired :

- For new concrete coating work : single-layer watertight epoxy systems , capable of resisting future cracking in the concrete substrate of up to 2/10 ths of a mm – see system sheet 301.

- For both new and remedial coating work on concrete : multi-layer waterproof epoxy systems , reinforced with a multi-axial glass tissue that provides the capability of absorbing without damage existing and future cracking in the concrete substrate of 10/10 ths, 15/10 ths and 20/10 ths of a mm , depending on the weight of the glass tissue reinforcement chosen - see system sheets 101, 102, 103, 201, 104, 105, 106, 114, 115 and 116 .

- For both new and remedial protective coating work on steel : single-layer anti-corrosion epoxy systems as per the French OHGPI G32 and G37 regulation – see system sheets 411 and 412 .

Limits of use :

- These types of coatings are not applicable to “D” type structures (prefabricated elements) , as mentioned in 3.3.4. of the Professional Recommendations of the ITBTP Publications (DTU 56/ Fascicule 74 and NF EN 1992-3) .
- BIOPERL® systems are not applicable to situations where the operating temperature of the content is above 95 °C .
- The degree of agressiveness of certain *industrial effluents* may be higher than the chemical tolerance of our BIOPERL® systems . *Please consult us systematically to obtain a tailor-made specification to suit the case you are working on .*

2. Description of BIOPERL® functionalities

The distinction between waterproofing and watertightening refers to current european normalisation - NF EN 1504-2 – as well as to the ITBTP publications mentioned above .

Adherent waterproofing, applicable to class C new or existing concrete buildings :

Consists of a coating capable of absorbing without damage mechanical stresses generated in particular by quantified substrate crackings and some counterpressures, while ensuring perfect inertia with respect to the chemical environment (cf. 4.1.2.1. of the ITBTP Publication) with which it is in contact.

This system consists of a jointless , reinforced coating based on BIOPERL® R solvent-free epoxy resin reinforced with glass tissue and with either a BIOPERL® T , a CHEMPERL VE-T or a GELCOAT SV101 topcoat , depending on the liquid or gas involved .

Semi-independent waterproofing, applicable to class C existing concrete buildings , whether currently coated or not :

Consists of a coating mechanically fixed to the concrete substrate , potentially through an existing coating , capable of bridging all existing and future cracks in the concrete substrate, within the limits fixed beforehand and depending on the weight to the chosen glass tissue reinforcement; while ensuring perfect inertia with respect to the chemical environnement (cf. 4.1.2.1. of the ITBTP Publication) with which it is in contact.

This system is identical to the previous system, except it is mechanically fixed to the substrate .

Adherent watertightness, applicable to class B new or existing concrete buildings :

Consists of a coating that brings watertightness to a concrete capacity as long as this remains stable as per NF EN 1992-3 : no cracking above 2/10 ths of a mm and no un-drained counter-pressure . Ensures perfect inertia with respect to the chemical environment (cf. 4.1.2.1. of the ITBTP Publications) with which it is in contact.

This system consists of a continuous BIOPERL® T single-layer coating, non-reinforced and adherent to the substrate except on existing cracks which must be bridged over with a reinforcement.

Anticorrosion protection, applicable to new or existing steel buildings :

Consists of a coating that will remain inert in contact with its chemical environment (cf. 4.1.2.1 of the ITBTP Publication), while providing anti-corrosion protection to the steel on which it is applied.

This system consists of a a continuous BIOPERL® T single-layer coating , non-reinforced and adherent , of varying thickness depending on the aggressiveness of the content .

3. Nature and quality of acceptable substrates.

Whether new or old , substrates should be the object of a written assessment carried out jointly by the civil works contractor and the application contractor before proceeding with the coating works , describing the condition of the surface , quantifying and qualifying any existing disorders and determining who is responsible to carry out the necessary corrections .

- *New concrete must be left to dry for at least 28 days before coating and old concrete must be in good condition* , designed, calculated and constructed in conformity with the prescriptions of the regulatory texts mentioned in the reference documents.

This applies in particular to the state of the surface : are deemed acceptable surface conditions obtained and/or restored using solutions proposed in our system sheets – see Chapter 4 below - and in our *Technical Advice Nr. 1 "Specification for preparation of concrete"* - see Appendix 3.

The state of the surface must be of a good quality as indicated in the NFP 18-201 Standard – Technical Specification – ref. DTU 23.1 and in chapters 7-3-1 of Norm NF EN 1992-1 & 1992-3 (EUROCODE N°2).

Any products used for the repair of the concrete must be validated prior to application by the application contractor to make sure they are compatible with our coatings and that no risk exists of them creating a difference in potential between old and new concrete parts that could cause degradation in the concrete and corrosion of the steel reinforcement .

- *New or old steel* structures must be within the limits defined in ISO 8501-1 standard (1988) – page 15, and referred to in the OHGPI circular G32 and G37.

4. Specifications :

♦ Coatings by function and type of structure:

Waterproofing and protection in contact with liquids (agressive waters) or gases (H2S, methane) at t° < 60°C

On new concrete or good quality existing concrete

Sheets 101 : **Reinforced coating 450g BIOPERL® R** with **BIOPERL® T** topcoat – 2.0 mm
102 : **Reinforced coating 800g BIOPERL® R** with **BIOPERL® T** topcoat – 2,5 mm
103 : **Reinforced coating1200g BIOPERL® R** with **BIOPERL® T** topcoat – 3.0 mm

Semi-independent (mechanically anchored) waterproofing and protection in contact with liquids (agressive waters) or gases (H2S, methane) at t° < 60°C

On existing concrete, pre-coated or not, without significant surface degradation

Sheet 201 : **Reinforced coating 800g BIOPERL® R** with **BIOPERL® T** topcoat – 2.5 mm

Waterproofing and protection in contact with agressive liquids (to be defined) at t° ≤ 95°C

On new concrete or good quality existing concrete

Sheets 104 : **Reinforced coating450g BIOPERL® R** with **CHEMPERL VE-T** topcoat – 2.0 mm
105 : **Reinforced coating800g BIOPERL® R** with **CHEMPERL VE-T** topcoat – 2.5 mm
106 : **Reinforced coating1200g BIOPERL® R** with **CHEMPERL VE-T** topcoat – 3.0 mm
114 : **Reinforced coating450g BIOPERL® R** with **GELCOAT SV101** topcoat – 2.0 mm
115 : **Reinforced coating800g BIOPERL® R** with **GELCOAT SV101** topcoat – 2.5 mm
116 : **Reinforced coating1200g BIOPERL® R** with **GELCOAT SV101** topcoat – 3.0 mm

Watertightness and protection in contact with liquids (agressive waters) or gases (H2S, methane) at t° < 60°C

On new concrete

Sheet 301 : **Single coat BIOPERL® T** – 0.8 mm

Watertightness and anti-corrosion protection of immersed , emerged or marling areas in contact with liquids (agressive waters) or gases (H2S , methane) at t° ≤ 50°C

On new or existing steel substrates

Sheets 411 : **Single coat BIOPERL® T** – 0.6 mm
412 : **Single coat BIOPERL® T** – 1 mm

♦ Treatment of singular points:

Each structure and/or specification with one or more of these points should be treated according to the corresponding drawing(s).

Max Perlès

sheet nr.101
Bioperl® / P45

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 450 g/sqm of fiberglass

for: the waterproofing and protection of wastewater and desalination structures, such as digesters, thickeners, storage & clarifying basins, desanding pools, settling & flocculation tanks.

in contact with: domestic and industrial wastewaters, seawater *and* agressive waters or gases (H_2S, methane) at t° < 60°C

substrate: new concrete or existing concrete in good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (***except if there exists a risk of un-drained counter-pressure)***
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P45 *– thickness* 2 mm**:*

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  Bioperl® R coat for **impregnation**, using a roller, **550 microns**, **750 g/sqm**
  Glassfabric P45 to be unrolled, and debubblized using a special roller, **450 g/sqm**
  Bioperl® R coat for **saturation**, using a roller, **400 microns**, **550 g/sqm**
  Silica SBO to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of **Bioperl® T**, using airless spray or roller, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee:10 years

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 10/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

This proposal is based on our n° FA0095300 , products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.102
Bioperl® / P80

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 800 g/sqm of fiberglass

for: the waterproofing and protection of wastewater and desalination structures, such as digesters, thickeners, storage & clarifying basins, desanding pools, settling & flocculation tanks.

in contact with: domestic and industrial wastewaters, seawater and agressive waters or gases (H_2S, methane) at t° < 60°C

substrate: new concrete or existing concrete in reasonably good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (***except if there exists a risk of un-drained counter-pressure)***
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P80 *– thickness* 2.5 mm**:*

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **700 microns**, **950 g/sqm**
  - **Glassfabric P80** to be unrolled, and debubblized using a special roller, **800 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **500 microns**, **700 g/sqm**
  - **Silica SBO** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of **Bioperl® T**, using airless spray or roller, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee:10 years

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 15/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations

To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.103
Bioperl® / P120

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 1200 g/sqm of fiberglass

for: the waterproofing and protection of wastewater and desalination structures, such as digesters, thickeners, storage & clarifying basins, desanding pools, settling & flocculation tanks.

in contact with: domestic and industrial wastewaters, seawater and agressive waters or gases (H_2S, methane) at t° < 60°C

substrate: new or existing concrete

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P120 *– thickness* 3 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **800 microns**, **1100 g/sqm**
  - **Glassfabric P120** to be unrolled, and debubblized using a special roller, **1200 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **600 microns**, **800 g/sqm**
  - **Silica SBO** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of **Bioperl® T**, using airless spray or roller, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee:10 years

Including **the resistance to to substrate cracks, existing or to come of up to 20/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

♦♦♦♦♦♦

Max Perlès

sheet nr.201
Bioperl® / P80, plugged

Mechanically-fixed Waterproof fiberglass-reinforced epoxy protective lining

made of: solvent-free epoxy reinforced with 800 g/sqm of fiberglass

for: the waterproofing and protection of wastewater and desalination structures, such as digesters, thickeners, storage & clarifying basins, desanding pools, settling & flocculation tanks.

in contact with: domestic and industrial wastewaters, seawater and agressive waters or gases (H_2S, methane) at t° < 60°C

substrate: previously coated concrete

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Removal** of all bad or non adhesive particules of the previous coating by any suitable means
- **Levelling** of the blistered or projecting zones by grinding, until obtaining an even, plane surface
- **Cleaning** by any suitable means until total depollution, removal of dust with industrial vacuum cleaner
- **Rendering** of surface defects with epoxy **Render AR100**

The existing coating can be preserved in whole or part on condition that its adherence to the substrate is minimum 1 MPa according to NF EN 24624. The naked concrete zones must be prepared identically to those receiving an adherent coating.

Advice: the application under the laminate of our conductive primer **SCREENPERL (200µ)** allows homogeneous dielectric testing despite the potentially insulating presence of the previous coating.

System Bioperl® / P80 plugged – *thickness* 2.5 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  Bioperl® R coat for **impregnation**, using a roller, **700 microns**, **950 g/sqm**
  Glassfabric P80 to be unrolled, and debubblized using a special roller, **800 g/sqm**
  Bioperl® R coat for **saturation**, using a roller, **500 microns**, **700 g/sqm**
  Silica SB0 to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Fixed** mechanically every 50 cm with **Exco plugs**/PP 8/50 ∅ 32 mm, as per *Technical Advice nr 21* "Mechanical fixing in one piece of laminates"
- **Reinforcement** with mat washers **RM 60** ∅ 12 cm, 5 u/sqm, saturated of **Bioperl R**, **10 g/u**, and sprinkled with **Silica SB0** while progressing
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of **Bioperl® T**, using airless spray or roller, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee:10 years

Including **the resistance to all substrate cracks, existing or to come .**
Exclusion : any defects resulting from **the counter-pressure exercised at the back of the coating by un-drained water**
This proposal is based on n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.104
Bioperl® / P45, topcoat Chemperl® VE-T

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 450 g/sqm of fiberglass + specific vinylester topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels (except deodorization towers – see sheet nr.106)

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new concrete or existing concrete in good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (*except if there exists a risk of un-drained counter-pressure)*
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P45 *with* Chemperl® VE-T *topcat – thickness* 2 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **550 microns**, **750 g/sqm**
  - **Glassfabric P45** to be unrolled, and debubblized using a special roller, **450 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **400 microns**, **550 g/sqm**
  - **Silica SBO** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of vinylester **Chemperl® VE-T** divided in 2 passes, using a flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 10/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

Reservations *:* surface colour may change, cleaning after contact with reagents within a period to be defined

This proposal is based on our n° FA0095300 , products civil liability insurance policy "after delivery", within its terms and limitations

To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.105
Bioperl® / P80, topcoat Chemperl® VE-T

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 800 g/sqm of fiberglass + specific vinylester topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels (except deodorization towers – see sheet nr.106)

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new concrete or existing concrete in reasonably good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (*except if there exists a risk of un-drained counter-pressure)*
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P80 *with* Chemperl® VE-T *topcat – thickness* 2.5 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **700 microns**, **950 g/sqm**
  - **Glassfabric P80** to be unrolled, and debubblized using a special roller, **800 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **500 microns**, **700 g/sqm**
  - **Silica SB0** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of vinylester **Chemperl® VE-T** divided in 2 passes, using a flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 15/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).
Reservations *:* surface colour may change, cleaning after contact with reagents within a period to be defined
This proposal is based on n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.106
Bioperl® / P120, topcoat Chemperl® VE-T

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 1200 g/sqm of fiberglass + specific vinylester topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels, deodorization towers

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new or existing concrete

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (***except if there exists a risk of un-drained counter-pressure)***
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P120 *with* Chemperl® VE-T *topcat – thickness* 3 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **800 microns**, **1100 g/sqm**
  - **Glassfabric P120** to be unrolled, and debubblized using a special roller, **1200 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **600 microns**, **800 g/sqm**
  - **Silica SB0** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** one coat of vinylester **Chemperl® VE-T** divided in 2 passes, using a flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **the resistance to to substrate cracks, existing or to come of up to 20/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

Reservations *:* surface colour may change, cleaning after contact with reagents within a period to be defined

This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations

To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.114
Bioperl® / P45, topcoat Gelcoat SV101

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 450 g/sqm of fiberglass + specific novolac topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels (except deodorization towers – see sheet nr.106)

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new concrete or existing concrete in good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (***except if there exists a risk of un-drained counter-pressure)***
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P45 *with* Gelcoat SV101 *topcat – thickness* 2 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  Bioperl® R coat for **impregnation**, using a roller, **550 microns**, **750 g/sqm**
  Glassfabric P45 to be unrolled, and debubblized using a special roller, **450 g/sqm**
  Bioperl® R coat for **saturation**, using a roller, **400 microns**, **550 g/sqm**
  Silica SBO to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** novolac-epoxy **Gelcoat SV101** divided in 2 passes, using a medium bristle roller/flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 10/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).
Reservations : surface colour may change, cleaning after contact with reagents within a period to be defined
This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.115
Bioperl® / P80, topcoat Gelcoat SV101

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 800 g/sqm of fiberglass + specific novolac topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels (except deodorization towers – see sheet nr.106)

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new concrete or existing concrete in reasonably good condition

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (***except if there exists a risk of un-drained counter-pressure)***
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P80 *with* Gelcoat SV101 *topcat – thickness* 2.5 mm**:*

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **700 microns**, **950 g/sqm**
  - **Glassfabric P80** to be unrolled, and debubblized using a special roller, **800 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **500 microns**, **700 g/sqm**
  - **Silica SBO** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** novolac-epoxy **Gelcoat SV101** divided in 2 passes, using a medium bristle roller/flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **resistance to existing and bridged substrate cracks of up to 20/10th mm, resistance to new cracks of up to 15/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).
Reservations *:* surface colour may change, cleaning after contact with reagents within a period to be defined
This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.116
Bioperl® / P120, topcoat Gelcoat SV101

Waterproof fiberglass-reinforced epoxy protective coating

made of: solvent-free epoxy reinforced with 1200 g/sqm of fiberglass + specific novolac topcoat

for: the waterproofing and protection of wastewater and desalination structures, such as retention pits, gutters, vats, storage vessels, deodorization towers

in contact with: agressive liquids (to be defined), at t° ≤ 95°C

substrate: new or existing concrete

Preparation as per Technical Advice nr 1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** of concrete with waterborne epoxy **Primer EDO** or **Screenperl®** solvent free conductive epoxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape (*except if there exists a risk of un-drained counter-pressure)*
- **Rendering** of surface defects with epoxy **Render AR100**

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

System Bioperl® / P120 *with* Gelcoat SV101 *topcat – thickness* 3 mm*:

- **Uninterrupted laminate** of fiberglass/epoxy as per *Technical Advice nr 14*, comprising:
  - **Bioperl® R** coat for **impregnation**, using a roller, **800 microns**, **1100 g/sqm**
  - **Glassfabric P120** to be unrolled, and debubblized using a special roller, **1200 g/sqm**
  - **Bioperl® R** coat for **saturation**, using a roller, **600 microns**, **800 g/sqm**
  - **Silica SB0** to be sprinkled while progressing by mechanical projection, **400 g/sqm**
- **Checking** as per *Technical Advice nr 3* "Performance testing" and *nr 4* "Dielectric testing"
- **Repair** of defects as per *Technical Advice nr 5* "Retouching"
- **Topcoat** novolac-epoxy **Gelcoat SV101** divided in 2 passes, using a medium bristle roller/flat brush, **600 microns**, **800 g/sqm**

* When only partially coating a vertical surface (such as walls), we recommend that the top of the coating be stopped in an engraving (see TA nr. 7 and sketch nr. 8)

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: up to 10 years, depending on liquid's aggressiveness

Including **the resistance to to substrate cracks, existing or to come, up to 20/10th mm** and **resistance to counter-pressure through the substrate of up to 1 bar** (10 meters of water).

Reservations *:* surface colour may change, cleaning after contact with reagents within a period to be defined

This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations

To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

Max Perlès

sheet nr.301
Bioperl® – 0.8 mm

Watertight coating

made of: single-layer solvent-free epoxy

for: the interior watertightness of wastewater and desalination structures, such as storage & clarifying basins, desanding pools, settling & flocculation tanks, gutters, glances, foul air ducts.

in contact with: domestic and industrial wastewaters, seawater and agressive waters or gases (H_2S, methane) at t° < 60°C

substrate: new concrete

Preparation as per Technical Advice nr.1 "Specification for preparation of concrete", and as a minimum:

- **Obtaining** a healthy and homogeneous [2] substrate, free from laitance, loose particles and dust, over 100 microns surface roughness, using appropriate mechanical means
- **Removal** of dust with industrial vacuum cleaner
- **Impregnation** .of concrete with **Screenperl,** solvent free conductive époxy, using a roller, **250 g/sqm**
- **Bridging** of existing cracks with a 10 cm wide plasticized adhesive tape overlaid with a 20 cm wide strip of glassfabric tissue **R45**, **450 g/sqm**, **impregnated** and **saturated** with **Bioperl® R** at **250g/lm**, and sprinkled with **Silica SBO** while progressing
- **Complete rendering of the concrete surface** using our epoxy **Render AR100,** 600-800 g/sqm, depending on state of surface

Proper adherence of a coating depends on the quality of the substrate and on its surface preparation. **Surface cohesion must be 1,5 MPa minimum** in the case of new concrete and **1 MPa minimum** in the case of rehabilitation of existing concrete.

Bioperl® *coating – thickness* 0.8 mm:

- **Application** of **Bioperl® T**: in 1 layer using airless spray gun 45/1 minimum
  Theoretical consumption: **1100 g/sqm** for **800 microns**
  or by roller in 2 coats of 400µ - 550g/sqm each, between 3 to 5 hours interval
  or by roller in a 1st coat, 400µ - 550g/sqm, sprinkled mechanically with **silica SBO**
  by progressing and after drying, application of a 2nd coat, 400µ - 550g/sqm
- **Checking** as per Technical Advice nr.3 "Performance testing" and nr.4 "Dielectric testing"
- **Repair** of defects as per Technical Advice nr.5 "Retouching"

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Reference documents :

Civil Works Fascicule 74. ITBTP – May 1990, for C Class Structures.

Guarantee: 10 years

Excluding **any defects resulting from :**

- an existing, un-bridged and/or un-reinforced crack, as per treatment specified above ("bridging")

- a crack of more than 2/10th mm appearing after coating

- the counter-pressure exercised at the back of the coating by un-drained water.

This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

♦♦♦♦♦♦

Max Perlès

sheet nr.411
Bioperl® 600µ, on Sa2.5 Steel

Anti-corrosion protective coating

made of: single-layer solvent-free epoxy

for: the interior protection of structures such as reservors, gasometers, industrial water tanks, screen cleaners, raising screws

in contact with: domestic and industrial wastewaters, seawater *or* brackish waters at t° ≤ 50°C

substrate: new steel or steel in good surface state (1)

Preparation as per Technical Advice nr.2 "Specification for steel preparation", and as a minimum:

- **Grinding** — of barbs and welding projections until elimination, and of the weld beads and sharp angles for softening
- **Blasting** (2) — by any appropriate means to obtain equivalent to Sa 2.5 standard, with a Medium G or a Rt 50-75 microns profile
- **Removal** — of dust with industrial vacuum cleaner
- **Application** — while progressing and before any flash-rusting of one stand-by coat of **ED1 Varnish,** solvent borne epoxy, 30 µm dry film, **100 sqm**.

Bioperl® *coating – thickness* 0.6 mm:

- **Application** — of **Bioperl® T**: In 1 layer using airless spray 45/1 minimum, Theoretical consumption: **800 g/sqm** for **600 microns**, except extra thickness along the weldings
- **Checking** — as per *Technical Advice nr.3* "Performance testing" and *nr.4* "Dielectric testing"
- **Repair** — of defects as per *Technical Advice nr.5* "Retouching"

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Guarantee: 5 years.

In accordance with Circular G37 of the OHGPI.
This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

♦♦♦♦♦♦

(1) **This specification is for structures corroded to a maximum of state C as per ISO 8501-1988 - page 15**:
- On the assumption of an important corrosion where state D is reached without however being exceeded, a rendering of the corrosion cankers is necessary with **Render AR100**, solventfree epoxy charged with Silica.
- If corrosion exceeds state D, the implementation of an **Bioperl® R system reinforced with glassfiber** is necessary before the application of the topcoat **Bioperl® T**.

(2) **In case of sweating of steel plates loaded with oily products, observe a 48 h delay after blasting before application.**
If brown stains appear within the 48h, a new blasting of the affected areas must be done until they disappear.

Max Perlès

sheet nr.412
Bioperl® 1000µ, on Sa2.5 Steel

Anti-corrosion protective coating

made of: single-layer solvent-free epoxy

for: the interior protection of structures such as reservors, gasometers, industrial water tanks, screen cleaners, raising screws

in contact with: domestic and industrial wastewaters, seawater or brackish waters at t° ≤ 50°C

substrate: new steel or steel in good surface state (1)

Preparation as per Technical Advice nr.2 "Specification for steel preparation", and as a minimum:

- **Grinding** — of barbs and welding projections until elimination, and of the weld beads and sharp angles for softening
- **Blasting** (2) — by any appropriate means to obtain equivalent to Sa 2.5 standard, with a Medium G or a Rt 50-75 microns profile
- **Removal** — of dust with industrial vacuum cleaner
- **Application** — while progressing and before any flash-rusting of one stand-by coat of **ED1 Varnish,** solvent borne epoxy, 30 µm dry film, **100 sqm**.

Bioperl® *coating – thickness* 1 mm:

- **Application** — of **Bioperl® T**: In 1 layer using airless spray 45/1 minimum, Theoretical consumption: **1350 g/sqm** for **1000 microns**, except extra thickness along the weldings
- **Checking** — as per *Technical Advice nr.3* "Performance testing" and *nr.4* "Dielectric testing"
- **Repair** — of defects as per *Technical Advice nr.5* "Retouching"

Application conditions:

A loss factor has to be added for practical consumption, **about 15%**, according to means and methods used.

Guarantee: 10 years.

In accordance with Circular G37 of the OHGPI.
This proposal is based on our n° FA0095300, products civil liability insurance policy "after delivery", within its terms and limitations
To become effective, it must have been formalised in a duly signed guarantee commitment certificate.

♦♦♦♦♦♦

(1) **This specification is for structures corroded to a maximum of state C as per ISO 8501-1988 - page 15**:
- On the assumption of an important corrosion where state D is reached without however being exceeded, a rendering of the corrosion cankers is necessary with **Render AR100**, solventfree epoxy charged with Silica.
- If corrosion exceeds state D, the implementation of an **Bioperl® R system reinforced with glassfiber** is necessary before the application of the topcoat **Bioperl® T**.

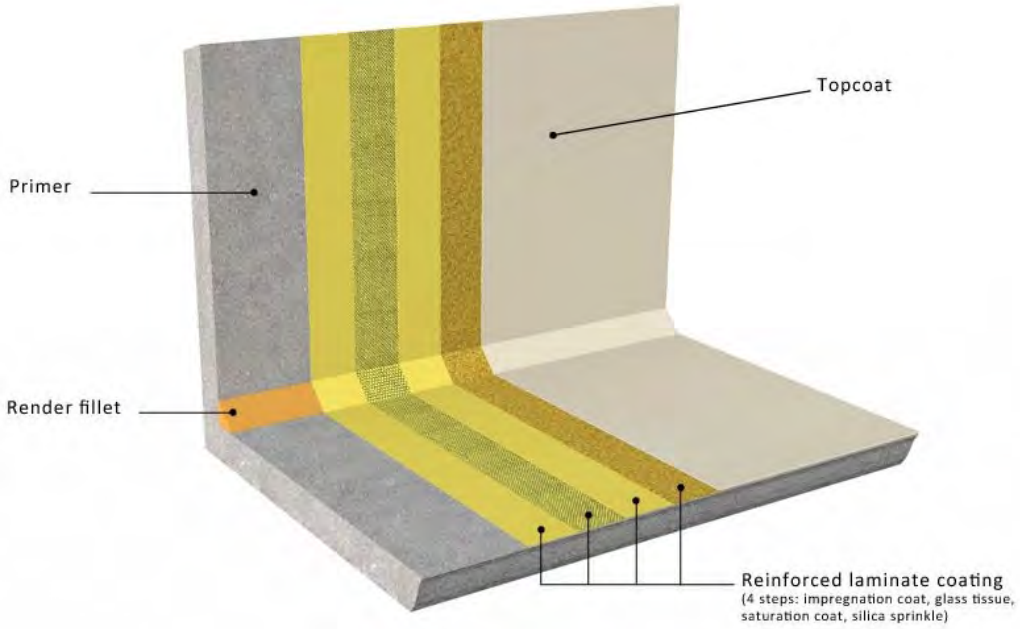
(2) **In case of sweating of steel plates loaded with oily products, observe a 48 h delay after blasting before application.**
If brown stains appear within the 48h, a new blasting of the affected areas must be done until they disappear.

Max Perlès
advanced industrial coatings

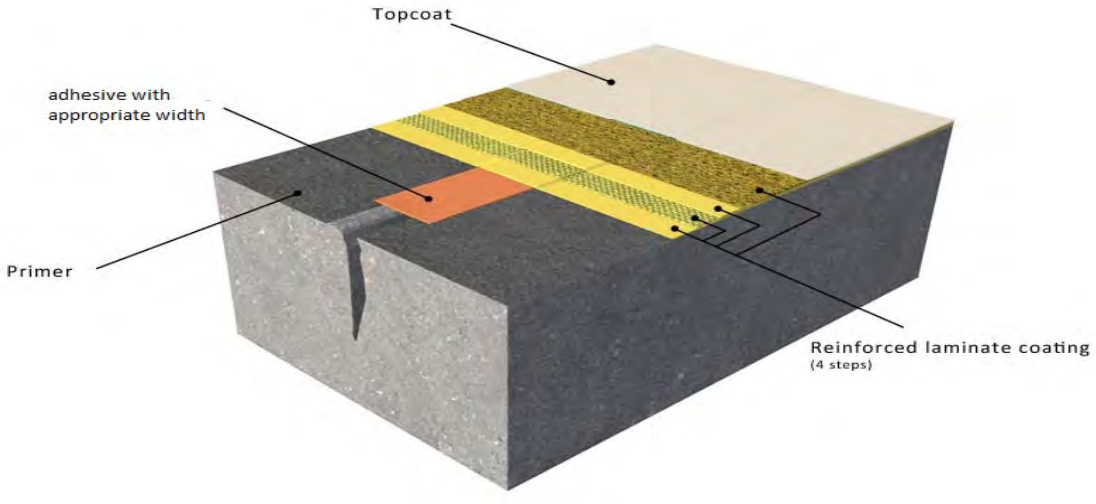
Coating of concrete structures
August 2019

Dealing with singular points: Sketch Book

Layered presentation of a laminate coating

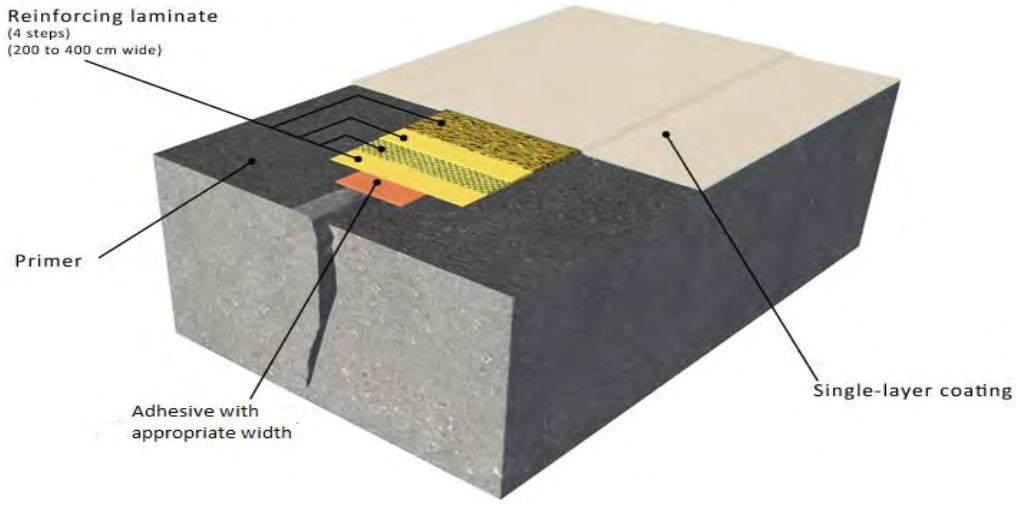


Sketch no.1: Treating a non active and non penetrating crack when applying a laminate coating

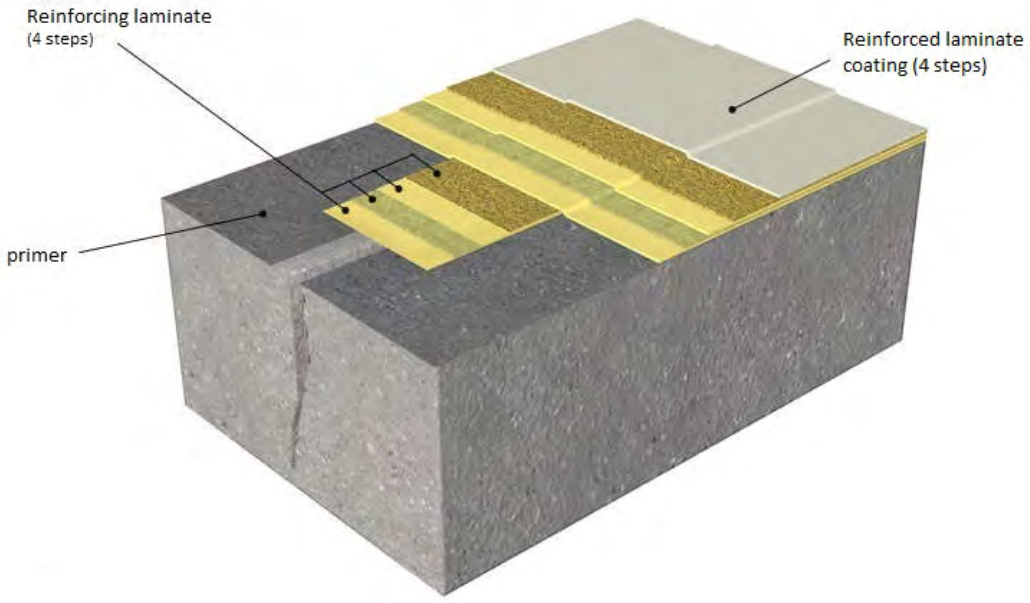


ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

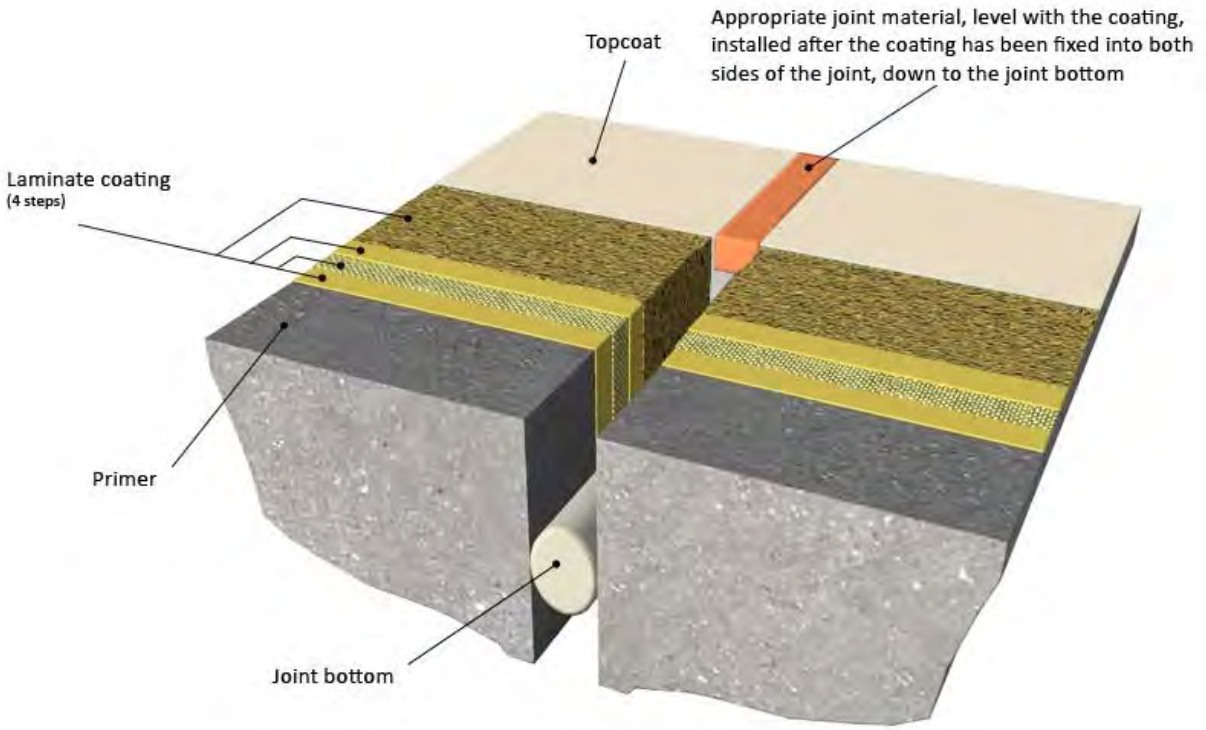
Sketch no.2: Treating a crack when applying a single-layer coating



Skectch no.3: Treating a crack when applying a laminate coating

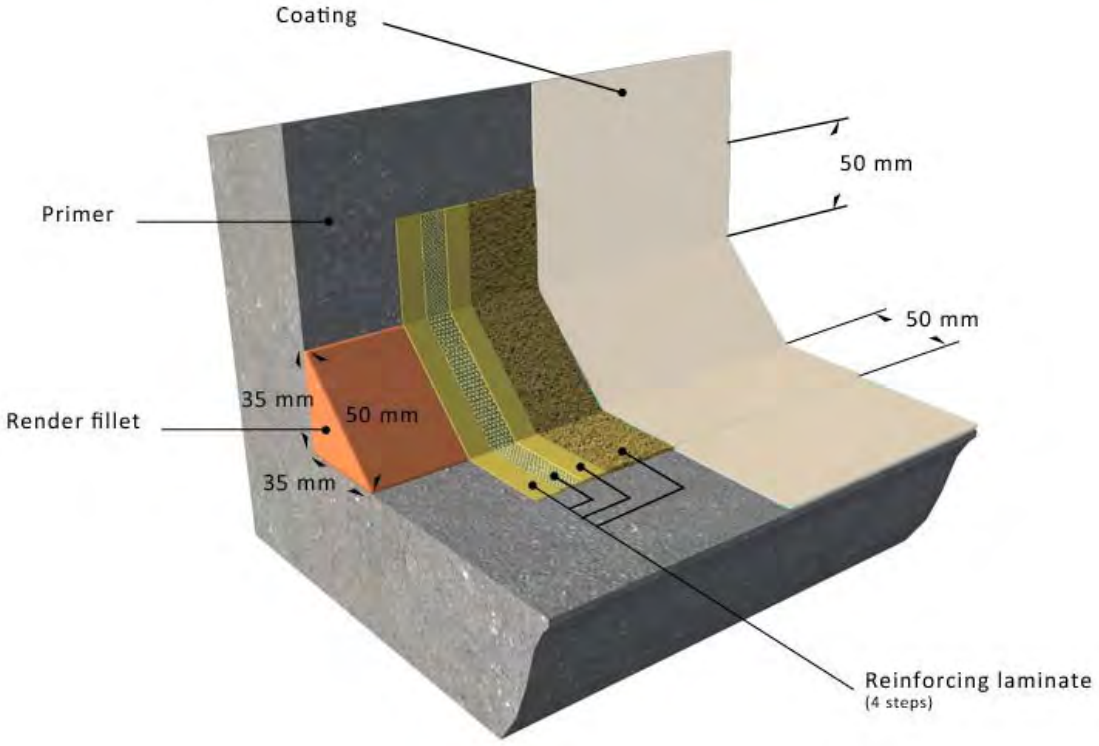


Sketch no.4: Treating an expansion joint or an active and penetrating crack when applying a laminate coating

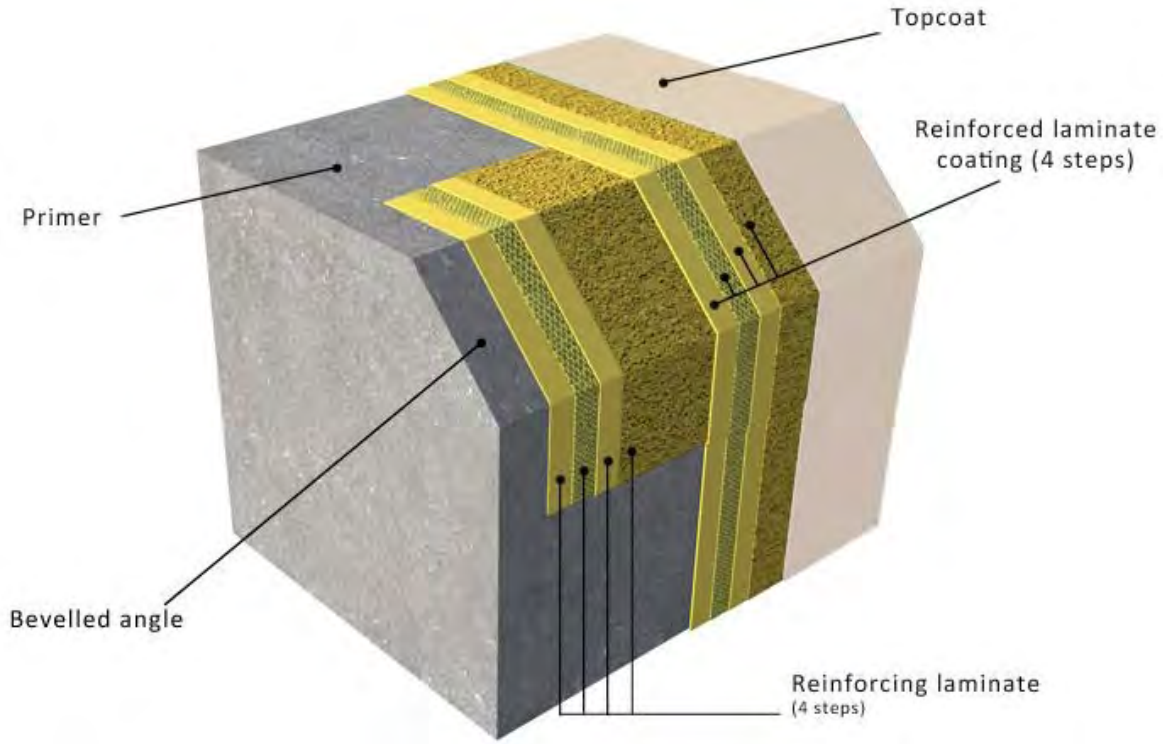


Treatment is the same when applying a single-layer coating

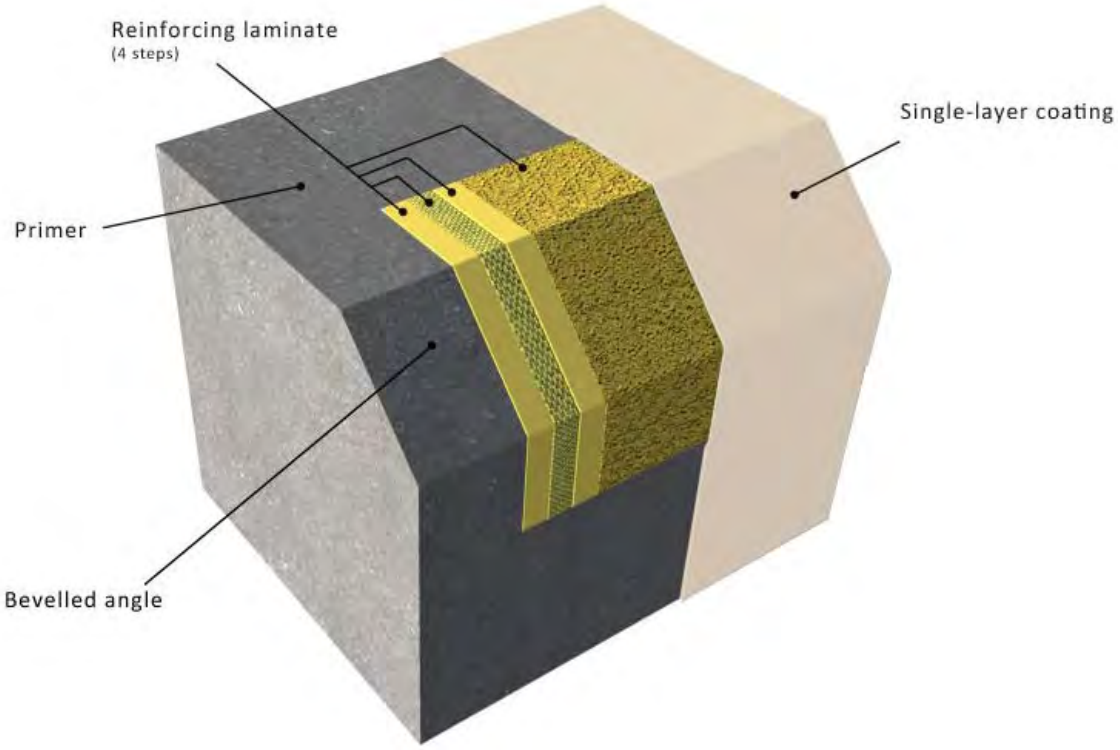
Sketch no.5: Treating a closed angle corner



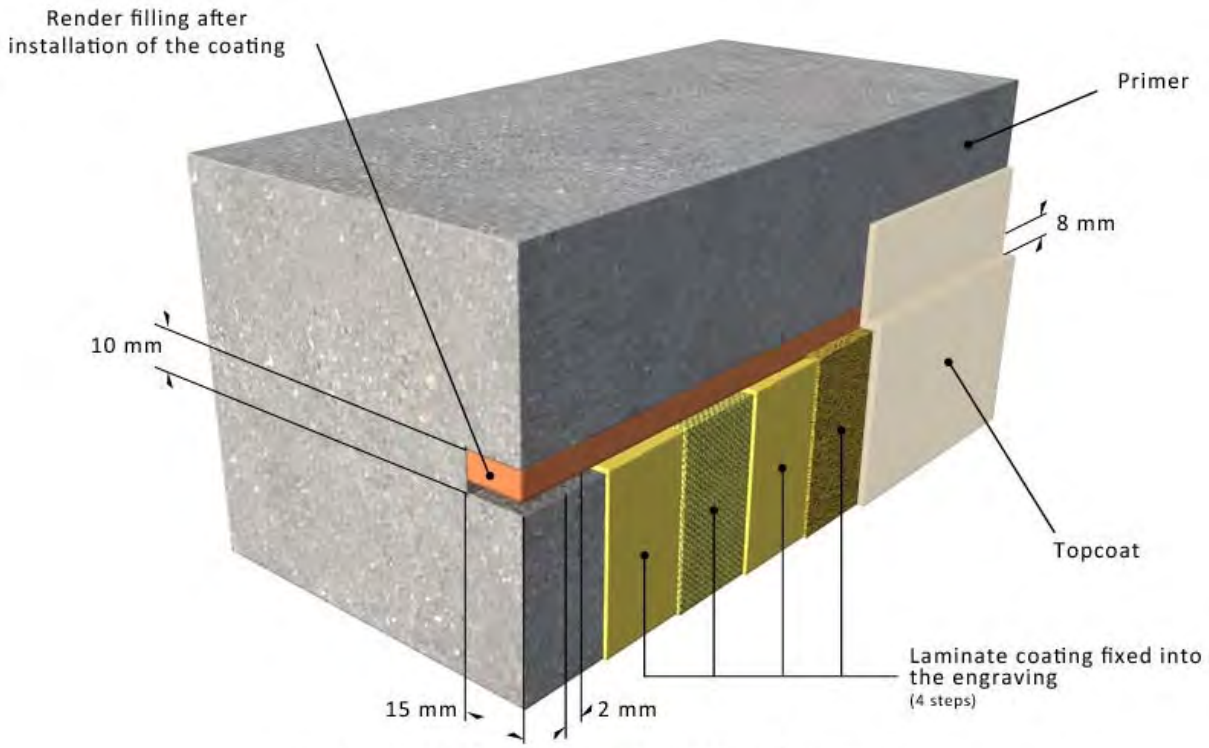
Sketch no.6: Treating an open angle when applying a laminate coating



Sketch no.7: Treating an open angle when applying a single-layer coating

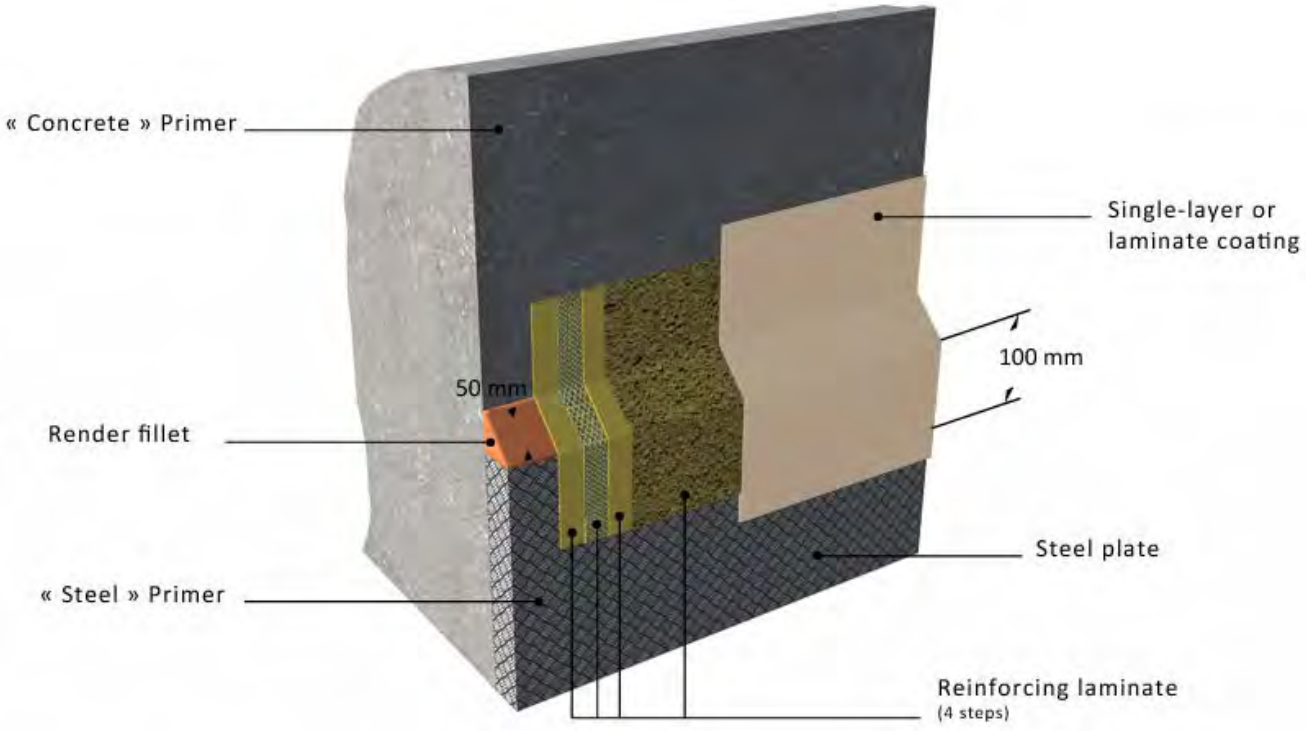


Sketch no.8: Treating an engraving when applying a laminate coating

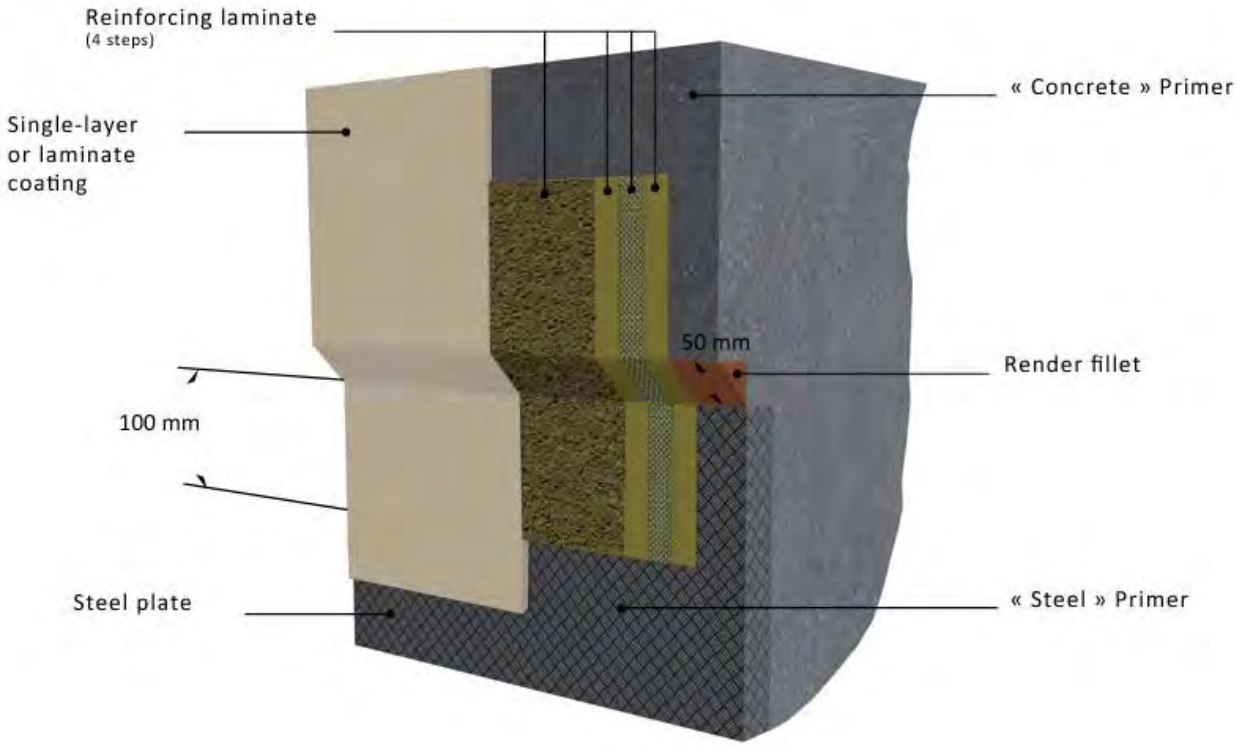


Treatment is the same when applying a single-layer coating

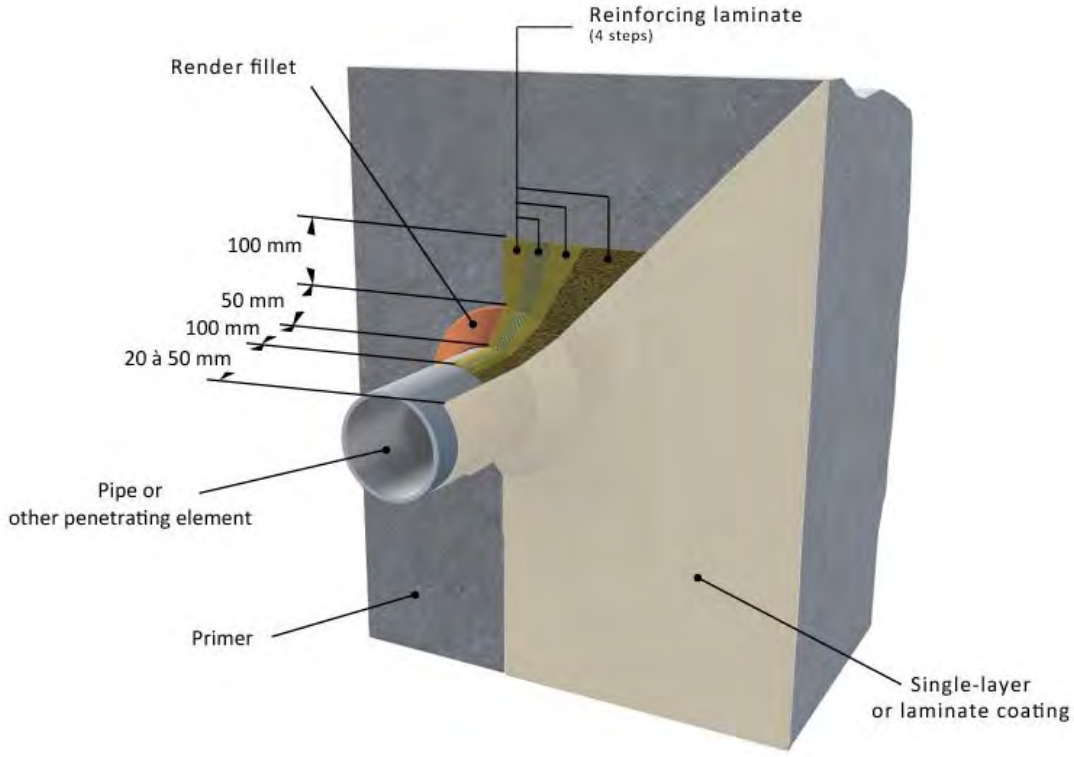
Sketch no.9: Treating an outgoing steel plate



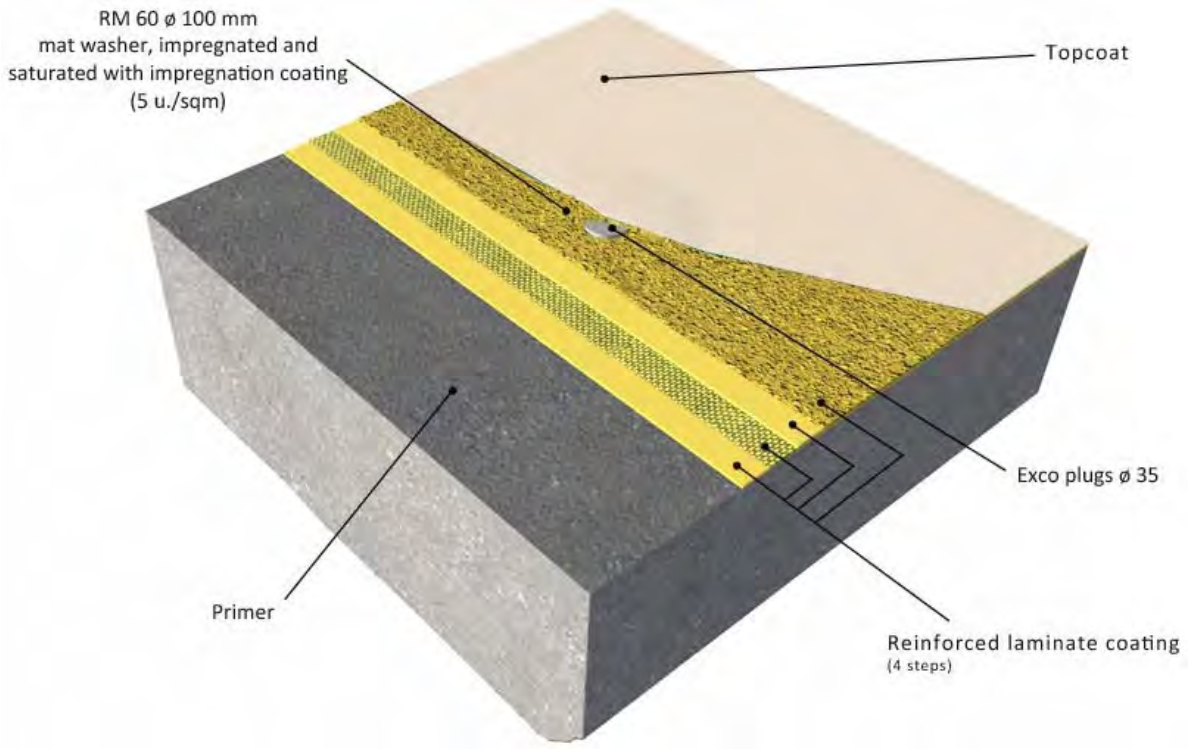
Sketch no.10: Treating an ingoing steel plate



Sketch no.11: Treating an incoming pipe or other penetrating element



Sketch no.12: Treating a mechanically-fixed (or anchored) coating



5. Performance testing and retouching

Testing is performed by the application contractor to check the reliability of its work.

Tests take place:

- during the application
- after the application.

They are carried out in conformity with the processes described in our *Technical Advice Nr. 3 "Performance Testing"* and *Technical Advice Nr. 4 "Dielectric Testing"* - see appendix 3.

They may lead to repairs or retouches using the *Technical Advice Nr. 5 "Retouching"* – see appendix 3.

6. Technical assistance

It is provided by our **Technical Assistance Department** upon request from the application contractor.

It comprises :

- theoretical and practical training
- recapitulating the main implementation phases
- performing jointly with the application contractor a **"reference zone"** on a representative area.

7. Commissioning

It can take place after a certain waiting time which varies according to the curing time of the coating at different temperatures:

- 10°C: 10 days
- 20°C: 7 days
- 30°C: 4 days
- 40°C: 3 days

8. Servicing / maintenance / repairs

They must be ensured in compliance with the principles described in Chapter 10 of the ITBTP Publication .
Refer also to the appropriate specific details in the *Technical Advice Nr. 5 "Retouching"* - see appendix 3.

9. Qualification of application companies

They must:

- either give proof of successful and equivalent experience under similar conditions
- or have received from us significant training specific to the products to be applied , borne out by the certification of the operators by one of our Technician-trainers .

10. Warranty - modalities and operation :

- Principle of operation:

It operates on the principle described in Chapter 11 of the ITBTP Publication.

- Definition:

This is a **performance guarantee** meaning that the coating implemented is capable of fulfilling the functions of:

- waterproofing or watertightness of the interior surfaces of a concrete structure
- protection of the interior surfaces of a steel structure
- non pollution of the contents, where appropriate, under specified conditions and for a specified time.

- Criteria:

They are studied according to the structure's specific operating parameters.
These criteria are notably:

- the degree of allowable cracking for the waterproofing or watertightness function
- possible nature, concentration, pH and temperature of the cleaning/disinfection products.

- Operating mode :

The warranty is jointly agreed to by ***max perlès et cie*** and the application contractor .

It is materialized in a **Joint guarantee** co-signed by the two parties and handed over to the beneficiary client / building owner.

It stipulates that , in case of a problem , the costs for removing the defective coating and supplying and applying a new coating are covered.

It is covered by an insurance policy taken out by each of the joint parties for its own liability according to the model hereafter .

SCOR
The Art & Science of Risk

Insurance Certificate – General Liability

We **SCOR Europe SE**, located 5 Avenue Kléber - 75 116 Paris - France, hereby certifies that the company:

MAX PERLES et Cie
4 rue du Professeur René Dubos
60119 HENONVILLE

is insured under the policy n° **FA0095300** underwritten with our Company in respect of pecuniary consequences of general liability risks that may result from the Insured's Premises and due to Insured activities as mentioned in the policy.

Activity: Sale of products for the execution of covering work for storage and transport capacities in the field of water and sanitation.

The guarantees of the Contract are exercised up to the amounts indicated below:

Combined Insurance limit:

PUBLIC LIABILITY / PRODUCT LIABILITY

ALL COVERED DAMAGES COMBINED (Bodily injuries, Property damages and Financial losses):**10 M€** per year

Including:

- Pure Financial Losses ("D.I.N.C.") with the amount of **5 M€** per year
- "Faute inexcusable de l'employeur" with the amount of **5 M€** per year
- Dismantling/Reinstalling costs with the amount of **5 M€** per year
- Professional liability with the amount of **2.5 M€** per year
- Pollution Sudden and Accidental (classified locations excluded) with the amount of **3 M€** per year
- Damages resulting from exports to the USA/Canada, all damages aggregate (Bodily injuries, Property damages and Financial losses): with the amount of **5 M€** per year
- Including: Pure financial losses ("D.I.N.C.") on "Loss of use" basis with the amount of **1 M€** per year

DEFENSE AND RECOURSE: EUR 30'000 per claim and per year

The present certificate is certificate is valid for the period from 01/01/2022 to 31/12/2022 inclusive. It is addressed to whom it may concern and cannot bind the insurer beyond the limits of the clauses and conditions of the policy that it refers to and notably with respect to the activities covered by this policy.

This certificate is evidence the insurance as identified is in force and conveys all rights and privileges afforded under the policy, limits shown may have been reduced by paid claims.

Issued in Paris, 11/01/2022

SCOR
The Art and Science of Risk
Europe SE
11 Jan 2022

Digitally signed by
Ana Vázquez Ballestín
Date: 2022.01.11
14:50:38 +01'00'

SCOR Europe SE
5 avenue Kléber - 75116 Paris - France
Tél. : +33 (0) 1 58 44 70 00 - Fax : +33 (0) 1 58 85 00
RCS Paris 840 025 509 - Siret 840 024 509 00019
Société Européenne au capital de 14 700 000 euros

Max Perlès

Waterproof , Watertight and Protective coatings

Appendix 1

Test report

CE marking and Performance Declaration

Origin of the products

Max Perlès

Waterproof , Watertight and Protective coatings

Tests

- *CEBTP Test Report :*

CEBTP SOLEN – Rapport n° BPI8-6-065/1 : available on request
GINGER CEBTP – Rapport n°BEB6.K.3058-2/1 : available on request

- *Performances:*
    - *Water pressure*
    - *Water counterpressure*
    - *Continuous condensation*
    - *Adhesion to concrete before and after ageing*
    - *Adhesion to wet concrete*
    - *Adhesion to steel*
    - *Cracking before and after ageing*

- *Chemical:*
    - *Permeability to oxygen*

LNE – Publication P137771

- *Resistance to impact and indentation:*

GINGER CEBTP – Publication n° BEB6.H.3036.

- *CE marking and declaration of performances BIOPERL® system 1 current version*

LABORATOIRE DE TRAPPES
29 avenue Roger Hennequin – 78197 Trappes Cedex
Tél. : 01 30 69 10 00 – Fax : 01 30 69 12 34

RAPPORT D'ESSAI

Le présent rapport d'essai a été modifié comme suit :

- **Page 2 paragraphe 1 : Modification de la référence et date de réception**

Demandeur :	MAX PERLES ET CIE SA 4 rue du Professeur Dubos BP 2 60119 HENONVILLE France
Date de la demande :	V/accord du 28/01/2015 - Référence DEVIS 2015/1273
Objet :	Perméabilité à l'oxygène
Document de référence :	Norme ASTM D 3985 (2005) et ISO 15105-2 Annexe A (02/2003)
Identification des échantillons :	Plaque en composites

1. DESCRIPTION DES ECHANTILLONS

Le demandeur a adressé au Laboratoire national de métrologie et d'essais un échantillon en composite référencé :

Stratifié BIOPERL P45 : revêtement stratifié Bioperl avec tissu de verre de 450 g/m² : épaisseur 2 mm.

Date de réception : 9 février 2015.

2. CONDITIONS D'ESSAIS

Mesure du coefficient de transmission de l'oxygène selon les normes ASTM D 3985 et ISO 15105-2 Annexe A dans les conditions particulières suivantes :

Conditionnement préalable : 48 heures à 23°C et 50 %HR

Conditions de mesure :

- Température : 23°C
- Humidité : 90 %HR
- Mesures avec 100 % d'oxygène sur 2 éprouvettes de 0,5 dm² (une par plaque)
- Temps de stabilisation : de 48 à 180 heures (environ)
- Appareil de mesure : Oxtran 2/20
- La surface des échantillons n'étant pas suffisament plane pour être placée directement sur l'appareil de mesure, et avoir une étanchéité satisfaisante, les épouvettes ont été collées sur un masque métallique,
- Réalisation des mesures avec une cellule déportée placée dans une enceinte thermique.

3. RESULTATS

Période de réalisation des essais : de juillet à décembre 2015.

Les résultats de mesures obtenus à 10 °C, 25 °C et 40 °C sont regroupés dans le tableau ci-dessous.

Perméabilité à l'oxygène ($cm^3/m^2.24h.bar$)			
Eprouvette	Température		
	10 °C	25 °C	40 °C
1	0.27	1.47	5.70
2	0.51	3.05	7.76
Moyenne	0.39	2.26	6.73

En appliquant la loi d'Arrhenius aux données expérimentales il est possible d'en déduire par extrapolation les valeurs de perméabilité à 5 °C et 60 °C.

$$P = P_0 e^{-\frac{E}{RT}}$$

P : perméabilité à la température T,
R : constante des gaz parfaits
P_0 et E, valeurs calculées à partir des données expérimentales

La courbe établie à partir des valeurs moyennes est présentée en Annexe 1 (ln(P) = f (1/T)).

Les valeurs estimées par ce moyen sont alors de :

- 0,25 cm3/m².24h.bar pour 5 °C,
- 37 cm3/m².24h.bar à 60 °C.

Trappes, le 18 décembre 2015

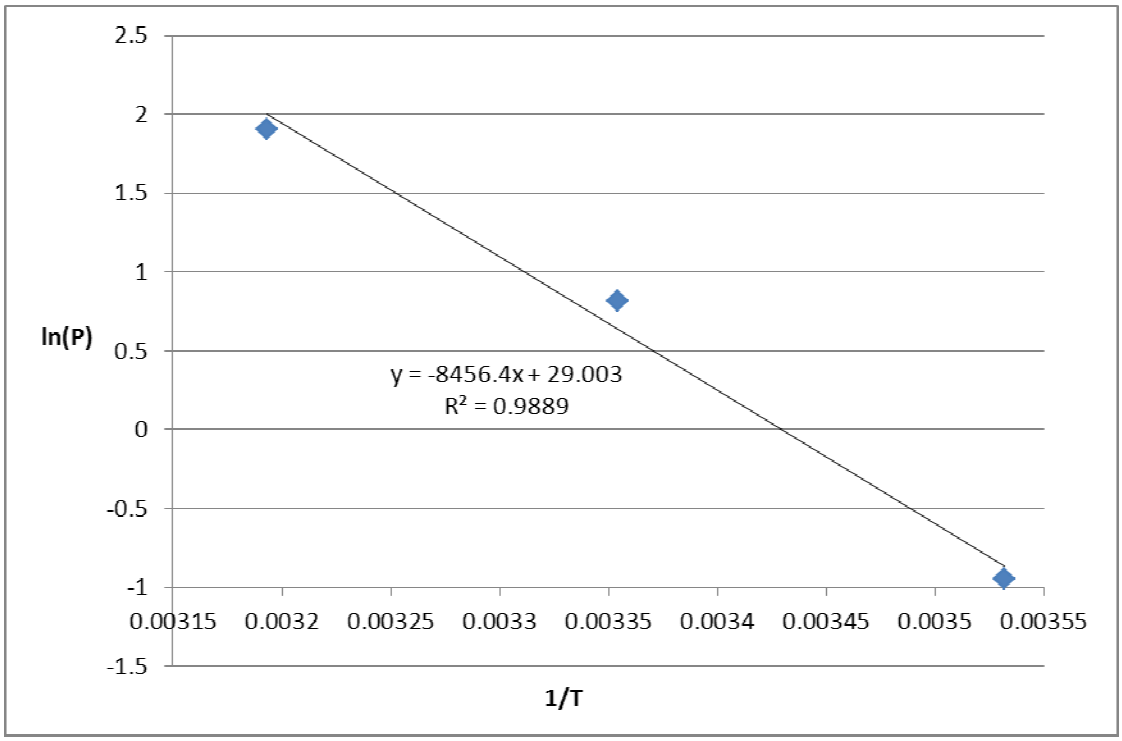
Le Responsable de l'essai

Laboratoire national de métrologie et d'essais • LNE

Pascal LAUNAY

Les résultats mentionnés ne sont applicables qu'aux échantillons, aux produits ou aux matériels soumis au LNE et tels qu'ils sont définis dans le présent document.

ANNEXE 1


2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
ln(P)
y = -8456.4x + 29.003
R² = 0.9889
0.00315
0.0032
0.00325
0.0033
0.00335
0.0034
0.00345
0.0035
0.00355
1/T

GINGER CEBTP

MAX PERLES ET CIE
4, rue du Professeur Dubos
60119 Henonville
A l'attention de M. François TAILLIBERT

Rapport n° BEB6.H.3036

Système BIOPERL

Essais de résistance au choc et poinçonnement

30 novembre 2017

Ce rapport d'essais ne vaut que pour l'objet soumis aux essais et ne préjuge pas des caractéristiques de produits similaires. Il ne constitue pas une certification de produits au sens de l'article L 115-27 du code de la consommation et de la loi du 3 juin 1994.

Sauf autorisation préalable, le présent rapport n'est utilisable, à des fins commerciales ou publicitaires, qu'en reproduction intégrale. Les résultats obtenus ne sont pas généralisables sans justification de la représentativité des échantillons et/ou corps d'épreuves et des essais.

Département Enveloppe du Bâtiment

Laboratoire Mastics Colles et Revêtements

ELANCOURT

Votre interlocuteur :

Marie LESAGE

Tel : 01 30 85 41 16

Fax : 01 30 85 23 20

m.lesage@groupe-cebtp.com

Le présent rapport comprend 8 pages.

GINGER CEBTP

SOMMAIRE

1. IDENTIFICATION DE L'ECHANTILLON

1.1. Procédés

Le procédé BIOPERL armé est un revêtement à base de résine époxydique sans solvant pour étanchéité, imperméabilisation ou anticorrosion de capacités d'eaux usées et industrielles, boues et environnements gazeux.

Le système testé est constitué des produits suivants :

- Primaire : IMPRESSION W
- Stratification : BIOPERL R + Mat 450
- Finition : PEINTURE ACRS-HV

1.2. Essais

Lieu des essais : Ginger CEBTP - 78990 Elancourt
Date des essais : du 18 septembre 2017 au 28 septembre 2017.

1.3. Corps d'épreuve

Maquettes mises en œuvre par le client dans ses locaux du 25 au 28 juillet 2017.
Les maquettes d'essais, réceptionnées, prêtes à être testées, ont été enregistrées sous le numéro : 132172 en date du 04 août 2017.

1.4. Mise en œuvre

Réalisée par M. Vincent PIERRE (Max Perlès et Cie).

1.5. Nature des essais

Résistance au poinçonnement statique selon une adaptation de la norme XP P 84-373
Détermination de la résistance au choc selon NF EN ISO 6272-1

2. TEXTES DE REFERENCE

- **Norme XP P 84-373** (Septembre 1999) « Produits d'étanchéité liquide (SEL) – Essai de poinçonnement statique après épreuves d'abrasion et cycles climatiques ».
- **Norme NF EN ISO 6272-1** (Octobre 2011) « Peintures et vernis – Essais de déformation rapide (résistance au choc) ».

3. CONTEXTE

La société **MAX PERLES ET CIE**, représentée par François TAILLIBERT, a sollicité le service Mastics, Colles et Revêtements de **Ginger CEBTP** pour caractériser et évaluer les performances de son revêtement BIOPERL armé de 3 mats de 450 g/m², en terme de résistance au poinçonnement statique et de résistance à la déformation rapide (choc).

Les essais ont été réalisés après acceptation du devis n°BEB6.H.0091 du 06 juin 2017.

4. OBJET

Le présent rapport a pour objet la synthèse des résultats constatés lors des essais cités ci-dessus.

5. INTERVENANTS

5.1. Personnes effectuant les essais

- Stéphane OLLIER GINGER CEBTP

6. DESCRIPTION DES PRODUITS TESTES

La confection des maquettes a été réalisée par le client dans ses locaux, du 25 au 28 juillet 2017, à partir des produits suivants :

	Produit		
Désignation commerciale	**Impression W**	**BIOPERL R**	**ACRS-HV**
Fonction	Primaire	Revêtement eau usées	Peinture
N° lot	Base n°17062801	Base n°16120505	16092906
	Durcisseur n°17062006	Durcisseur n°16120204	
Date de fabrication	n.c.	n.c.	n.c.
Date de péremption	n.c.	n.c.	n.c.
Ration de mélange (en poids)	Base 82 / durcisseur 18	Base 75 / durcisseur 25	Sans objet
Durée pratique d'utilisation	1h à 20°C	70 min à 20°C	Sans objet
Durée de séchage	24h	24h	2h
Nature chimique	Epoxy solvantée	Epoxy polyamine	Acrylique phase aqueuse
Conditionnement	Système bi-composant	Système bi-composant	Système mono-composant

- Armature MAT 450 (n° de lot : nc) : fibres de verre, de masse surfacique 450 g/m².
- Silice F15 (n° lot non communiqué)

Mise en œuvre :

- Selon les informations communiquées par le client, les conditions de température et d'hygrométrie pendant les applications étaient comprises entre T° = 20,0°C et 23,9 °C et entre 60,0 et 63,0 % HR. A réception des maquettes, ces dernières ont été reconditionnées pendant une durée minimale de 7 jours dans des conditions normalisées T° (23 +/- 5) °C et (50 +/- 5) % HR.

- Le support utilisé est un support acier, fourni et préparé par le client, de rugosité Rt 50-80 µm - Sa 3.

PRIMAIRE IMPRESSION W :
le produit est mis en œuvre par mélange de la base (B) et du durcisseur (D) avec un ratio pondéral B/D = 82/18 et appliqué à la brosse.

REVÊTEMENT BIOPERL R :
le produit est mis en œuvre par mélange de la base (B) et du durcisseur (D) avec un ratio pondéral B/D = 75/25 et appliqué au rouleau en 3 couches en alternance avec des armatures MAT 450.

ARMATURE MAT 450 :
le produit est appliqué au rouleau débouleur.

FINITION PEINTURE ACRS-HV :
le produit est appliqué au rouleau en 2 couches.

Consommations, délais de recouvrement, conditions

Selon les informations du client, les produits Primaire EDO et BIOPERL ont été appliqués selon les consommations réelles suivantes :

- **<u>Résistance au poinçonnement statique</u>**

Couche	Date application	Rendement pratique	Consommation pratique				
			ép. 1	ép. 2	ép. 3	ép. 4	ép. 5
Primaire Impression W	25 juillet 2017	75 g/m²	1,69 g **75 g/m²**	1,69 g **75 g/m²**	1,69 g **75 g/m²**	1,69 g **75 g/m²**	1,69 g **75 g/m²**
Revêtement Bioperl R x 3 couches	26 juillet 2017	792 g/m² x 3	17,82 g **792 g/m²**	17,82 g **792 g/m²**	17,82 g **792 g/m²**	17,82 g **792 g/m²**	17,82 g **792 g/m²**
Armature MAT 450 x 3 couches							
Revêtement Bioperl R		660 g/m²	14,85 g **660 g/m²**	14,85 g **660 g/m²**	14,85 g **660 g/m²**	14,85 g **660 g/m²**	14,85 g **660 g/m²**
1e couche de finition ACRS-HV	27 juillet 2017	275 g/m²	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**
Silice F15	n.c.						
2e couche de finition ACRS-HV	28 juillet 2017	275 g/m²	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**	6,18 g **275 g/m²**

- **Résistance au choc**

Couche	Date application	Rendement pratique	Consommation pratique				
			ép. 1	ép. 2	ép. 3	ép. 4	ép. 5
Primaire Impression W	25 juillet 2017	75 g/m²	6,75 g **75 g/m²**	6,75 g **75 g/m²**	6,75 g **75 g/m²**	6,75 g **75 g/m²**	6,75 g **75 g/m²**
Revêtement Bioperl R x 3 couches	26 juillet 2017	792 g/m² x 3	71,28 g **792 g/m²**	71,28 g **792 g/m²**	71,28 g **792 g/m²**	71,28 g **792 g/m²**	71,28 g **792 g/m²**
Armature MAT 450 x 3 couches							
Revêtement Bioperl R		660 g/m²	59,4 g **660 g/m²**	59,4 g **660 g/m²**	59,4 g **660 g/m²**	59,4 g **660 g/m²**	59,4 g **660 g/m²**
1e couche de finition ACRS-HV	27 juillet 2017	275 g/m²	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**
Silice F15	n.c.						
2e couche de finition ACRS-HV	28 juillet 2017	275 g/m²	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**	24,75 g **275 g/m²**

- Un délai de séchage minimum de 7 jours a été respecté avant essais.

7. PRINCIPE DES ESSAIS

7.1. Résistance au poinçonnement statique selon une adaptation de la norme XP P 84-373

Le principe de cet essai est d'appliquer une charge constante sur un revêtement, par l'intermédiaire d'une bille de 10 mm de diamètre, pendant 24 heures.

A l'issue de l'essai, les points suivants sont relevés :

- la profondeur d'enfoncement, à 0,01 mm près
- Observations visuelles de tout phénomène (faïençage, fissure, etc.)

La charge appliquée, retenue par le client est de 250 N.

Les essais ont été réalisés sur 3 maquettes (support métallique + revêtement armé), de dimensions 150 mm x 150 mm.

7.2. Détermination de la résistance au choc selon NF EN ISO 6272-1

Le principe de cet essai est d'évaluer la résistance du revêtement au craquelage ou au décollement de son support, quand il est soumis à une déformation provoquée par une masse tombante (percuteur).

La masse du percuteur est de 2000 g et son diamètre est de 23 mm. Les essais de chute sont réalisés selon la méthode de l'essai de classement décrit dans la norme NF EN ISO 6272-1, pour déterminer la hauteur de chute et la masse minimales provoquant un craquelage ou un décollement du subjectile. Pour chaque essai réalisé, le résultat est classé « résiste » ou « ne résiste pas » en fonction d'un examen à l'œil nu et à la loupe.

On note comme point de « fin d'essai », la combinaison masse/hauteur pour laquelle les résultats obtenus passent de « plutôt résistant » à « plutôt non résistant ».

Les essais ont été réalisés sur 3 maquettes (support métallique + revêtement armé), de dimensions 300 mm x 300 mm.

8. RESULTATS DES ESSAIS

8.1. Résistance au poinçonnement statique selon une adaptation de la norme XP P 84-373

Les essais sont réalisés dans les conditions de température et d'hygrométrie normalisées : à (23 ± 2) °C et (50 ± 5) % HR.

Maquette	Enfoncement (mm)	Moyenne enfoncement (mm)	Observations
N° 1	0,47	**0,42**	Aucun défaut n'a été constaté sur les 3 éprouvettes
N° 2	0,43		
N° 3	0,36		

8.2. Détermination de la résistance au choc selon NF EN ISO 6272-1

Les essais sont réalisés dans les conditions de température et d'hygrométrie normalisées : à (23 ± 2) °C et (50 ± 5) % HR.

RESISTANCE AU CHOC		
Hauteur de chute maximale testée (cm)	**Résiste**	**Ne résiste pas**
100	X	
	X	
	X	
	X	
	X	
	X	

Les essais ont été réalisés jusqu'aux capacités maximales de l'appareil (100 cm en hauteur et 2000 g en masse). En condition maximale, le revêtement est marqué par un poinçon, sans aucune fissure, ni éclat, ni décollement. La résistance du revêtement est donc supérieure à la capacité maximale de l'appareil.

Le Technicien en charge des essais du service Mastics, Colles et Revêtements	La chef du service Mastics, Colles et Revêtements
Stéphane OLLIER	**Marie LESAGE**

Max Perlès
revêtements techniques industriels

DECLARATION DES PERFORMANCES

1	7	1	2	0	0	1

Mise à jour

Révision	*Date*	*Rédaction*	*Approbation*
A	14/12/17	F. TAILLIBERT	F. MUTEAU
B	17/12/18	F. TAILLIBERT	F. MUTEAU
C	17/12/20	F. TAILLIBERT	F. MUTEAU
E	10/01/2022	V.DOUVRIN	F. MUTEAU

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

EN 1504-2

1. Code d'identification unique du produit type :	**BIOPERL – Système 1**
2. Usage(s) prévu(s) :	Produit de protection de surface du béton. Revêtement à base de résine époxy **Norme EN 1504-2 : 2005** **Principes : 1, 2, 8** **Méthodes : 1.3, 2.2, 8.2**
3. Fabricant :	**Max Perlès et Cie** 4 rue du Professeur Dubos 60119 Hénonville
4. Mandataire :	Non applicable
5. Système d'Evaluation et de Vérification de la Constance des Performances :	Système 2+
6. a) Norme harmonisée **Organisme notifié :**	NF EN 1504-2 Avril 2005 1164 CERIB
6. b) Document d'évaluation européen : **Evaluation technique européenne :**	Non applicable Non applicable

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

7. Performances déclarées

Caractéristiques essentielles	Performances	Spécifications techniques harmonisées
Résistance à l'abrasion NF EN ISO 5470-1	PND	EN 1504-2 Avril 2005
Perméabilité au CO_2 : NF EN 1062-6	S_D > 50 m	
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2	Classe II	
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3	W < 0,1 kg/ (m^2 x $h^{0,5}$)	
Résistance aux chocs : NF EN ISO 6272-1	PND	
Adhérence par traction : NF EN 1542	≥ 2.0 MPa	

8. Déclaration

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées conformément au règlement (U.E) n° 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

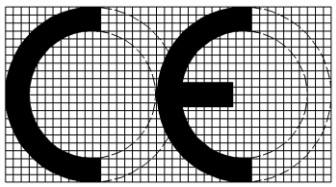
Signé pour le fabricant et en son nom par :

Vanessa Douvrin
Responsable QHSE

Environnement, Santé et Sécurité (REACH)

Une fiche de donnée de sécurité est établie pour ce produit conformément à l'article 31 du règlement REACH. Elle est disponible sur le site www.quickfds.fr.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com


Primaire EDO – Bioperl T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
17
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 17.12.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg / (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Origin of the products

Design and manufacture :

They are designed and manufactured in our plant at Hénonville, Oise, France, under a Quality System conforming to ISO 9001 version 2015 and certified by Bureau Veritas Certification France under nr. FR067169-1.

Labelling/packaging/storage :

Packaging includes in particular the following indications:

- risk and safety phrases and logos:
- manufacture date
- shelf life
- storage conditions
- mixing proportions

Max Perlès

Waterproof , Watertight and Protective coatings

Appendix 2

Product Technical Data Sheets

ED1 VARNISH
EDO PRIMER
SCREENPERL®

AR100 RENDER

BIOPERL®
CHEMPERL® VE
GELCOAT SV101

FIBERGLASS FABRICS P45, P80, P120

Max Perlès
advanced industrial coatings

data sheet
august 2019

Varnish

ED1

Solvent borne epoxy

scope:
steel preparation

CHARACTERISTICS

Description / purpose
Undercoat for our epoxy coatings, used :
- either as a stand-by primer for :

1 to 3 months in outside exposure, depending on climatic conditions, and up to 6 months when not directly exposed to weathering.
- or as a sealer on zinc rich primed surfaces.

Color / finish
Clear / satin

Packaging
In 2 separate cans, pre-adjusted for 3 or 8 kg.
Proportions, by weight: base 65 / hardener 35

Storage conditions
- 18 months max, , in the original cans, never opened,
- Under shelter.
- At temperatures of between 0°C/32°F et 35°C/95°F[(1)].

[(1)] *which might increase or decrease by 10°C/50°F, once only, during a 5 days max transport time to destination.*

V.O.C. content
478.1 g/l, according to ISO 11890-1 (statistical average).

Composition
Resin	:	epoxide
Hardener	:	polyamide
Pigments	:	none
Solvent	:	mixture of hydrocarbons/alcohols

Specific gravity (mix) at 20°C/68°F
0.95 ± 0.05 g/ml as per ISO 2811.

Solids content (mix)
By weight	:	48 % ± 2 as per ISO 3251.
By volume	:	40 % per calculation.

Viscosity (mix) at 20°C/68°F
25 to 35 seconds, Afnor cup nr 4.

IMPLEMENTATION

For all use :
Refer to relevant material safety data sheets as to risk sentences and safety recommendations

Surface preparation
- On abrasive blasted steel surfaces to Sa 2,5 mini, average profile : Medium G or Rt 50-75 µ.
- Compatible shop primer, after suitable treatment.

Instructions for use
- *Air temperature for application :*
  - Substrate : 3°C/37°F mini above dewpoint, with 5°C/41°F at least ♦ 45°C/113°F at most.
  - Product : 5°C/41°F mini ♦ 35°C/95°F maxi.
- *Mix* : Stir the base to an even consistency with a power mixer. Then add hardener and continue stirring until a perfectly homogeneous mixture is obtained.
- *Maturing* : 30 to 60 mn – Stir again before use.
- *Potlife mixture* at 20°C/68°F: 10 hours.
- *Application* with airless or conventional spray, even by brush on small surfaces, *without dilution*.

Coverage for a 30 micron – 1.2 mil dry film
Theoretical	: 14 sqm/kg	♦ 71 g/sqm
Practical	: 10 sqm /kg	♦ 100 g/ sqm

Curing at 10/30°C // 50/86°F
Temperature	*Dust free*	*Recoatable mini*	*Recoatable maxi*
10°C/50°F	30 mn	8 hours	18 hours
30°C/86°F	10 mn	4 hours	6 hours

Precautions and safety
Flammable product. Flash point (cc) : 25°C/77°F

Cleaning of application equipement
Flammable ED Thinner – Flash point (cc) : 25°C/77°F.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Fax: 33 (0) 3 44 49 85 00 – Web: www.maxperles.com

Max Perlès
advanced industrial coatings

data sheet
April 2022

Primer
EDO
waterborne epoxy

scope:
concrete preparation

CHARACTERISTICS

Description / purpose

Where: On concrete or under our epoxy systems.

What: Improving adhesion and wetting ability for our epoxy systems.

Reducing or even stopping of water infiltrations before coating.

Primer EDO is a component of two systems that carry a **CE Marking** and are adapted for the following protection situations : principle 1 , method 1.3 ; principle 2 , method 2.2 and principle 8 , method 8.2 of Norm NF EN 1504-2.

Colour / finish

Clear / satin.

Packaging

In 2 separate cans, pre-adjusted for 8 kg.

Proportions, *by weight*: base 385 / hardener 615.

Storage conditions

- 18 months max, in the original cans, never opened,
- Under shelter,
- At temperatures of between 1°C/34°F and 35°C/95°F [(1)].

V.O.C. content

0 g/l according to ISO 11890-1 (statistic average).

Composition

Resin:	epoxide	Pigments:	none
Hardener:	polyamide	Vehicle:	water

Specific gravity (mix) at 20°C/68°F

1.20 ± 0.05 g/ml as per ISO 2811

Solids content (mix)

By weight : 47 % ± 2 as per ISO 3251

By volumer : 36 % per calculation

Viscosity (mix) at 20°C/68°F

Fluid.

[(1)] *which might increase or decrease by 10°C/50°F, once only, during a 5 days max transport time to destination.*

IMPLEMENTATION

For all use:
refer to relevant material safety data sheets indicating risk sentences and safety recommendations

Surface preparation

Concrete free from oil, laitance and dust.

Possible application on damp but non sweating surface.

Instructions for use

- *Air temperature for application:*
  Substrate: 3°C/37°F above dewpoint, *with* 5°C/41°F at least ♦ 45°C/113°F at most.
  Product: 5°C/41°F mini ♦ 35°C/95°F maxi.
- *Reducing viscosity when temp.°<15°C/60°F:* add 10% water to the hardener *prior to mixing with the base.*
- *Mix:* Pour *the base into hardener* while carefully stirring mechanically until a perfectly homogeneous mixture is obtained.
- *Maturing*: none.
- *Potlife mixture* at 20°C/68°F: 2 hours [(2)]
- *Application*: roller or brush, exclusively.

[(2)] *The limit shows when a separation of phases becomes visible on the surface, producing a "turned" mix effect.*

Consumption / thickness

- 250 g/sqm in a single coat. EDO being an impregnation material, no specific thickness is required.
- 2, even 3 coats should be applied when lasting dampness on the substrate or in case of infiltration risks.

Curing at 10°C/50°F – 30°C/86°F

- Dust free: ..... 6 and 3 hours
- Recoatable: ..... mini: 6 and 3 hours ♦ maxi : none

Make sure of absence of humidity before recoating.

Precautions and safety

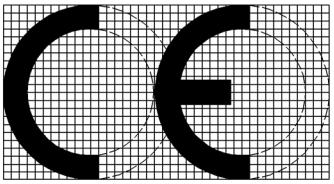
Waterborne product. Flash point (cc) : >100°C/212°F

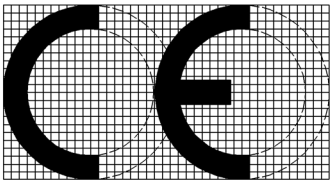
Cleaning of application equipment

- Immediately after use : water
- Afterwards and up to 3 hours standby :

Flammable ED Thinner – Flash point (cc) : 25°C/77°F.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Fax: 33 (0) 3 44 49 85 00 – Web: www.maxperles.com


Primaire EDO – Aquaperl T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
16
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 16.08.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg/ (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa


Primaire EDO – Bioperl T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
17
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 17.12.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg / (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa

Max Perlès
advanced industrial coatings

data sheet
April 2022

SCREENPERL®

conductive epoxy primer, solvent-free

scope:
concrete surface treatment

CHARACTERISTICS

Description / purpose

Where: On concrete or under our epoxy coatings.

What: Conductive layer guaranteeing homogeneous holiday (porosity) testing of the watertightness of the coating above.

Colour / finish

Black / glossy.

Packaging

In 2 separate cans, pre-adjusted for 8 kg.

Proportions, *by weight*: base 60 / hardener 40.

Storage conditions

- 18 months max, in the original cans, never opened,
- Under shelter,
- At temperatures of between 0°C/32°F and 35°C/95°F.

V.O.C. content

42 g/l (maximum), according to ISO 11890-1 (P1-M2).

Composition

Resin: epoxide Pigments: carbonated
Hardener: polyamine

Specific gravity (mix) at 20°C/68°F

1.05 ± 0.05 g/ml as per ISO 2811

Solids content (mix)

By weight : 96-100% after 6 hrs maturation - ISO 3251
By volume : 100 % per calculation

Viscosity (mix) at 20°C/68°F

36 Poises ± 4 poises.

Electrical resistivity (by volume) :

10^6 – 10^9 Ω.cm as per ASTM D257.

.

IMPLEMENTATION

For all use:
refer to relevant material safety data sheets indicating risk sentences and safety recommendations

Surface preparation

Concrete free from oil, laitance and dust.

If above an existing epoxy coating, sand-sprinkle first.

Instructions for use

- *Air temperature for application:*
  Substrate: 3°C/37°F above dewpoint, *with* 5°C/41°F at least ♦ 45°C/113°F at most.
  Product: 5°C/41°F mini ♦ 35°C/95°F maxi.
- *Mix:* Pour *the hardener into the base* while carefully stirring mechanically until a perfectly homogeneous mixture is obtained.
- *Maturing*: none.
- *Potlife mixture* at 20°C/68°F: 45mn
- *Application*: roller brush or airless spray.

Practical consumption

- 250 g/sqm

Curing

t°	*Dust Free*	*Overcoatable (minimum)*	*Overcoatable (maxium)*
10°C	10 h 00	12 h 00	30 days
20°C	5 h 00	6 h 00	15 days

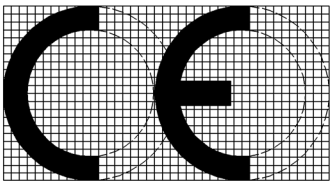
Precautions and safety

Solvent-free. Flash point (cf) : >100°C/212°F

Cleaning of application equipment

Flammable ED Thinner – Flash point (cf) : 25°C/77°F.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Web: www.maxperles.com


SCREENPERL – BIOPERL T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
20
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 20.11.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg/ (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa

Max Perlès
advanced industrial coatings

data sheet
March 2022

Render
AR100
solventfree epoxy

scope:
concrete and steel preparation

OVERVIEW

Purpose

Where: Under our epoxy systems or other compatible.

What: Surfacing, rendering, plugging, patching cavities, filling fixed joints, chamfers.

Which: Steel or concrete structures.

Description

Product : Solventfree epoxy, CMR's free, in the form of a pasty gel, after mixing of the 2 components.

Use : It can be used both for racking and for heavy filling, up to 15/20, or even 30 mm, vertically without recharging.

Properties and benefits

Mechanical properties :

Exceptional adhesion and sticking properties, with a very high mechanical cohesion.

Use properties :

Render AR100 is easy to use and polyvalent.
It requires neither powdering, nor grinding, except in case of binder raising at the surface: see page 2/2 « Recoating ».

Compliance with safety and regulatory requirements:
Render AR100 is ***solventfree***, flash point (cc): > 90°C/194°F for optimal safety and minimized application constraints.
It is ***aromatic amines or phtalates free*** for compliance with current regulations.

CHARACTERISTICS

Packaging

- In 2 separate cans, pre-adjusted for 4 or 12 kg.
- Proportions, *in weight:* base 85 / hardener 15

Storage conditions

- 18 months max, in the original cans, never opened,
- Under shelter,
- At temperatures of between 0°C/32°F and 35°C/95°F[(1)],

[(1)] *which might increase or decrease by 10°C/50°F, once only during a 5 days max transport time to destination.*

Colours

Yellow ochre, approaching RAL 8001.

Finish

Semi-flat.

V.O.C. content

17.7 g/l, according to ISO 11890-1 (statistic average).

Composition

Resin	:	epoxide
Hardener	:	non aromatic polyamine
Pigments	:	synthetic oxides
Filler	:	silicates/silica
Solvent	:	none

Specific gravity (mix) at 20°C/68°F

1.90 ± 0,05 g/ml as per ISO 2811

Solids content (mix)

By weight	:	96–100% after 6 hrs maturation - ISO 3251
By volume	:	100% per calculation

Viscosity (mix) at 20°C/68°F

Pasty.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 — Web: www.maxperles.com

IMPLEMENTATION

Conform and controlled conditions during application and hardening periods are necessary to obtain required quality

For all use: Refer to relevant material safety data sheets as to risk sentences and safety recommendations

♦ Before:

Surface preparation

Concrete impregnated with Primer EDO, Primer EDA or Screenperl® :
see relevant data sheets and *Technical Advice nr 1* : « Specification for preparation of concrete ».

Steel after smoothing sharp edges, on abrasive blasted surfaces to Sa 2,5 minimum.

Average profile :

- Case of prior application of Primer EDA (see data sheet) :

Medium G or Rt 50-75µ.

- Case of direct application :

Rough G or Rt 100µ.

Always apply on clean and dry substrates

Products preparation

24 hours minimum before application, place the drums in a temperate place at 10°C/50°F min and 30°C/86°F max.

Application temperatures:

Substrate:

3°C/37°F mini above dew point,
with 5°C/41°F at least ♦ 45°C/113°F at most.

Product:

While mixing : 10°C/50°F ♦ 30°C/86°F max
Use: at mixing temperature

Mixing

- *Never make up partial mixtures*, in order to avoid the risks of incorrect proportions.
- Pour the hardener on the base while carefully stirring mechanically until a perfectly homogeneous mixture is obtained.

Conditions for use

- Maturing : none.
- Apply immediately as far as mixing has been done.
- *Never dilute,* before nor during application.

Application conditions

- Manual :

Palette knife, spatula or trowel.

- Mechanically :

Pump for past-like product, or pneumatic double cartridge caulking gun with a static mixer

♦ During:

Potlife of mixture

10°C/50°F	20°C/68°F	30°C/86°F
4 h 00	2 h 00	1 h 00

Consumption / thickness per mm

1,9 kg/sqm.
This theoretical value should be *10±5% increased* to get it practical, according to nature of substrate and implementation method.

Note:

Consumption will increase when surface temperature is < 20°C, making the product viscous with its contact.

Overcoating

No minimum neither maximum after application, and no particular prior conditions, except in the following case :
Application with a thickness > 5 mm, as well as a strong smoothing, may result in a binder rise on the surface :
In that case it is necessary :
- either to sprinkle Silica SB0 or F15 on the fresh application, while progressing,
- either to sand down the coated surface, after at least 12/24 hours drying *according to temperature in order to get a Rough G.*

Cleaning of application equipment

Flammable ED Thinner. Flash point (cc): 25°C/77°F.

♦ After:

Curing

t°	*Dust free*	*Tack free*
10°C	8 to 9 h 00	24 h 00
20°C	5 to 6 h 00	15 to 18 h 00
30°C	2 to 2 h 30	5 to to 6 h 00

August 2019 : Replaces and cancels any former issue.

Max Perlès
advanced industrial coatings

data sheet
April 2022

BIOPERL®

« cold applied » solventfree epoxy

scope:
waste water treatment

OVERVIEW

Purpose

Where: Internal protection of digesters, decanters, reservoirs, muds storage tanks, flocculation vessels, gutters and sewage pipes.

What: contact with waste water, industrial water or gas.

Which: Steel or concrete structures.

Description

Product: solventfree epoxy, C.M.R.'s free.

As laminate lining, it is designed for tightness in cement works, or for reinforcement of steel works in which corrosion resulted in significant damage to the substrate.

As single thick coat, it is suitable for watertightness of concrete and/or anticorrosion of steel.

Use:

Bioperl® R: Impregnation/saturation of reinforcements
Bioperl® T: Top or single coat, from 500 to 1000µ

They can be applied with all the devices commonly used on job sites, see below Application.

Properties and benefits

Chemical performance:

• Oxygen permeation and resistance to H_2S:
LNE « oxygen transmission coefficient measurement » test report nr P137771 – Document DE/2

• Very good inertia to waste waters, greases, detergents, and to many of diluted bases and acids.

Mechanical resistance and proofing of laminate:

Especially high, as shown in CEBTP SOLEN tests report nr BP I8-6-065/1.

Surface properties:

Aspect : uniform and seamless glossy surface.
Result : very easy to clean, no weak areas.

Compliance with safety and regulatory requirements:

Bioperl® is *solventfree*, flash point (cc): > 90°C/194°F for optimal safety and minimized application constraints.
It is *aromatic amines or phtalates free* for compliance with current regulations.

Bioperl® conforms to European Norm NF EN 1504-2 « Systems for the surface protection of concrete »

A copy of the declaration of performances 1712001 of Bioperl® – system 1 made up EDO Primer and Bioperl® T topcoat is available on request.
A copy of the declaration of performances 2011001 of Bioperl® – system 2 made up Screenperl® and Bioperl ®T topcoat is available on request.

CHARACTERISTICS

Packaging

• In 2 separate cans, pre-adjusted: R: for 12 kg
T: 12 or 20 kg.
• Proportion, *by weight*: base 3 / hardener 1

Storage conditions

• 18 months max, in the original cans, never opened,
• Under shelter,
• At temperatures between 0°C/32°F and 35°C/95°F(1),

(1) *which might increase or decrease by 10°C/50°F, once only during a 5 days max transport time to destination.*

Colours

R/T: Light ochre.

Finish

Glossy with limited chalking and yellowing in operation *especially if implementation requirements are respected.*

Reinforcements

Please consult us.

V.O.C. content

R : 7.7 g/l, according to ISO 11890-1 (statistical average)
T : 12.7 g/l, according to ISO 11890-1 (statistical average)

Composition

Resin : epoxy
Hardener : non-aromatic polyamine
Pigments : synthetic oxides
Solvent : none

Specific gravity (mix) at 20°C/68°F

R/T : 1.32 ± 0.05 g/ml as per ISO 2811

Solids content (mix)

By weight : 96–100% after 6 hrs maturation - ISO 3251
By volume : 100% per calculation

Viscosity (mix) at 20°C/68°F

R : 4 500 mPa.s ± 1 000 ♦ 45 poises ± 10
T : 6 000 mPa.s ± 1 000 ♦ 60 poises ± 10

A slight evolution may happen during the storage period, with no effect on the application conditions.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Web: www.maxperles.com

IMPLEMENTATION

Conform and controlled conditions
During application and hardening periods
Are necessary to obtain required quality

For all use:
Refer to relevant material safety data sheets as to risk sentences and safety recommendations

♦ Before:

Surface preparation

Concrete impregnated with Primer EDO or EDA:
Refer to relevant data sheet and *Technical Advice nr1* « Specification for preparation of concrete ».

Steel after smoothing sharp edges, on abrasive blasted surfaces to Sa 2.5 degree. Average profile:

- In case of prior application of Primer EDA (see data sheet): Medium G or Rt 50-75µ.
- In case of direct application: Rough G or Rt 100µ.

Our expoxy laminates, according to specification.

Always apply on clean and dry substrates

Products preparation

24 hours minimum before application, place the drums in a temperate area at 10°C/50°F min and 30°C/86°F max.

Application temperatures

Substrate:
3°C/37°F mini above dew point,
with 5°C/41°F at least ♦ 45°C/113°F at most.

Product:

While mixing:	10°C /50°F mini ♦ 30°C/86°C maxi
Spraying:	at 30/35°C // 86/95°F at hose exit
Manual use:	at mixing temperature

Mixing

- *Never make up partial mixtures*, in order to avoid the risks of incorrect proportions.
- Stir the base with a power mixer to an even consistency. Then, add hardener and continue stirring until a perfectly homogeneous mixture is obtained.

Conditions for use

- No maturing before use.
- Start the application immediately after mixing.
- Bioperl® *should never be diluted*.

Application

Laminate – grade R:

- Medium bristle roller, or airless pump for the binder,
- Debubblizer roller for the glass fiber,
- Mechanical sprinkling of Silica SB 0 before drying.

Detailed procedure is described in our *Technical Advice nr 14* available on request.

singlecoat and/or topcoat – grade T:

- Airless spraying unit, with a 45/1 min pump ratio.
- Medium bristle roller, for small or difficult to access areas, on condition to *pay particular attention to the thickness and regularity of applied coat: this shall be followed by smoothing the surface with a flat brush*.

♦ During:

Pot life of mixture

Grades	10°C/50°F	20°C/68°F	30°C/86°F
R	3 h 15	1 h 10	0 h 30
T	2 h 15	0 h 40	0 h 10

In case of long lasting spraying application, the hose should be cleaned once per hour with ED Thinner.

Number of coats

2 per layer, except in case of multi-layer continuous application, plus 1 for topcoating or for a singlecoat.

Thicknesses

Laminate – grade R:
They are given upon specification, and vary with nature of the reinforcement: they are generally comprised between 2.0 and 3.0 mm, *including* a 600µ *topcoat*.

Top or Singlecoat – grade T:
Min 500 microns – max 1000 microns, according to spec.

Consumptions

Laminate – grade R:

- 1,4 kg/m² of binder for a P45 fabric-450 g/m² : 1,5 mm
- 1,8 kg/m² of binder for a P80 fabric-800 g/m² : 2,0 mm
- 2,2 kg/m² of binder for a P120 fabric-1200 g/m² : 2,5 mm

Top or singlecoat – grade T:
132 g/sqm per 100 microns thickness.
This theoretical value should be *20±5% increased* to get it practical, according to nature of substrate and implementation method.

Note:
Consumption will increase of 100 to 300 g/m² when surface temperature is < 20°C, making the product viscous with its contact.

Cleaning of application equipment

Flammable ED Thinner. Flash point (cc): 25°C/77°F.

♦ After:

Curing

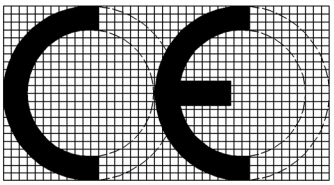
t°	Dust free	Tack free
10°C	R: 10 h 00 – T: 4 h 00	R: 26 h 00 – T: 12 h 00
20°C	R: 6 h 00 – T: 3 h 00	R: 16 h 00 – T: 10 h 00
30°C	R: 2 h 30 – T: 1 h 30	R: 7 h 00 – T: 4 h 00

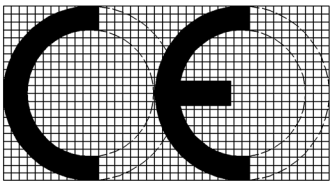
Delay before use: 10, 7 or 4 days, depending on temperature.

Repairs

Report to our *Technical Advice nr 5*.

august 2019: Replaces and cancels any former issue.


Primaire EDO – Bioperl T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
17
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 17.12.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg / (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa


SCREENPERL – BIOPERL T Max Perlès – 4 rue du professeur Dubos – BP 80439 – 60119 Hénonville
20
1164-CPR-PPR008 EN 1504-2 : 2005 DOP : 20.11.001
Produits de protection de surface Revêtement
Perméabilité au CO_2 : NF EN 1062-6 : S_D > 50 m
Perméabilité à la vapeur d'eau : NF EN ISO 7783-2 : Classe II
Absorption capillaire et perméabilité à l'eau : NF EN 1062-3 : W < 0,1 kg/ (m^2 x $h^{0,5}$)
Adhérence NF EN 1542 Pour système rigide avec trafic ≥ 2,0 MPa

Max Perlès
advanced industrial coatings

data sheet
February 2022

CHEMPERL® VE

Vinylester

scope:
chemistry and chemical stresses

OVERVIEW

Purpose

Where : Interior of tanks, reservoirs, retention pits.

What : Contact with liquids or gases particularly aggressive as alkaline and especially acids with high concentration.

Which : Steel or concrete structures.

Description

Product : vinylesters, C.M.R.'s free.

As laminate lining, it is designed for tightness in cement works, or for reinforcement of steel works in which corrosion resulted in significant damage to the substrate.

As single thick coat, it is suitable for anticorrosion of steel.

Use :

Chemperl® VE-S: Impregnation/saturation of reinforcements
Chemperl® VE-T: Top or single coat, from 600 to 1500µ
Please consult us.

Properties and benefits

Chemical performance:

A very low styrene content can guarantee the best resistance quality and minimize the risks of migration of unfixed styrene, liable to produce porosities and premature ageing.

S: Inferior to 33 % in weight

T: Inferior to 25 % in weight.

Mechanical cohesion and sealing:

Especially high, thanks to its behavior with cracking, shearing, tensile strength and counterpressure.

Surface properties:

Aspect : uniform and seamless glossy surface.
Result : very easy to clean, no weak areas.

Compliance with safety and regulatory requirements:

Chemperl® VE contains, at the delivery, styrene in small quantity. It is thus flammable and it is necessary to proscribe all sources of flame or sparks. Flash point: +32°Cf.

CHARACTERISTICS

Packaging

In 2 separate cans pre-adjusted for 10 kg

Proportions, by weight: S: base 98 / catalyst 2.
T: base 98.5 / catalyst, 1.5

Shipping/Invoicing tolerance : **± 10% of the quantity ordered**, due to the shelf life.

Storage conditions

6 weeks for the base and 12 months for the catalyst, under shelter, at temperatures of between 4°C - 39°F and 25°C - 77°F,

(1) *which might increase or decrease by 10°C/50°F, once only during a 5 days max transport time to destination.*

Colours / Finish

S: Amber coloured – semi glossy
T: Beige / satin

Fiber glass reinforcement quality

Please consult us.

V.O.C. content

S: 65 g/l (maximum)according to ISO 11890-1 (P1-M2)
T: 84 g/l (maximum)according to ISO 11890-1 (P1-M2)

Composition

Binder : vinylester-epoxy with low level of styrene monomer
Pigments : stable synthetic oxides
Solvent : present in forme of reactive styrene

Specific gravity (mix) at 20°C/68°F

S: 1.08 ♦ T: 1.20 ± 0,05 g/ml as per ISO 2811

Solids content (mix)

By weight : as per ISO 3251, 6 h after maturation
S: 94 – 98% T: 93 – 97%
By volume : 100% per calculation

Viscosity (mix) at 20°C/68°F

S: 1000 mPa.s ± 250 ♦ 10 poises ± 2.5
T: 2000 mPa.s ± 500 ♦ 20 poises ± 5.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Fax: 33 (0) 3 44 49 85 00 – Web: www.maxperles.com

IMPLEMENTATION

Conform and controlled conditions during application and hardening periods are necessary to obtain required quality

For all use: Refer to relevant material safety data sheets as to risk sentences and safety recommendations

♦ Before:

Surface preparation

Concrete impregnated with Primer SV100/B: Refer to relevant data sheets and Technical Advice nr1: 'Specification for preparation of concrete'.

Steel after smoothing sharp edges, on abrasive blasted surfaces to Sa 3 degree, average profile Medium G or Rt75µ, treated with Primer SV100/M: same data sheet than SV100/B.

Always apply on clean and dry substrates

Products preparation

24 hours minimum before application, place the drums in a sheltered place at 15°C // 59°F min and 25°C // 77°F max

Avoid contact between Chemperl® VE and copper, bronze and zinc.

Application temperatures

Substrate:

3°C/37°F mini above dew point,

with: 10°C // 50°F at least ♦ 35°C // 95°F at most.

Product :

While mixing: 15°C // 59°F min ♦ 25°C // 77° F max
Spraying use: at 25/30°C // 77/86°F at hose exit
Manual use: at mixing temperature

Instructions for use

- *Never make up partial mixtures*, in order to avoid the risks of incorrect proportions.
- Stir the base with a power mixer to an even consistency. Then, add catalyst and continue stirring until a perfectly homogeneous mixture is obtained.
- No maturing before use.

Application

Laminate – grade S:

With medium bristle roller or airless pump 45/l min for the binder and with air bubble releasing roller for the glassfiber or polyester tissue.

Detailed procedure is described in our *Technical Advice nr14* available on request.

Singlecoat and/or topcoat – grade T:

- Medium bristle roller *in 2 coats with surface smoothing using a flat brush, in only one direction, by respecting a minimum of 3 hours between coats, on condition to pay particular attention to the regularity of applied coat.*

♦ During:

Pot life of mixture at 15°C//59°F – 20°C//77F

S: 30 mn ♦ T: 45 mn

Number of coats

2 per layer, except in case of multi-layer continuous application, plus 1 for topcoating or for a singlecoat.

Thicknesses

Laminate – grade S:

They are given with particular specification, and vary with nature of the reinforcement: they are generally comprised between 2.0 and 5.0 mm, including topcoat.

Singlecoat or top coat (grade T):

Min 600 microns – max 1500 microns, according to spec.

Consumption

In laminate – *ex. with a 450 g/sqm reinforcement:*

- 1,1 kg/sqm of VE/S for a glassfiber tissue P45 – 1.5 mm
- 1,5 kg/sqm of VE/S for a glass matt M4 – 2.0 mm
- 3,0 kg/sqm of VE/S for 3 glass matts M4 – 3,5 mm

Single and/or topcoat:

133 g/sqm of Chemperl® VE/T per 100 microns thickness. This theoretical value should be *20±5% increased* to get it practical, according to nature of substrate and implementation method.

Note:

Consumption will increase by 100 to 300 g/sqm when surface temperature is < 20°C, making the product viscous with its contact.

Cleaning of application equipment

Thinner ED. Flammable product. Flash point (cf): 25°C.

♦ After:

Curing on a substrate at 20°C // 68°F

- Dust free ..... 3 hours
- Tack free ..... 6 hours

Delay before use: 2 to 7 days, according to forecasted use [(1)].

(1) It is in particular advised, each time possible, to improve hardening by a temperature rise: please consult us

Repairs

Report to our *Technical Advice nr 5*.

Max Perlès
advanced industrial coatings

data sheet
March 2022

Gelcoat

SV101

solventfree novolac epoxy

scopes:
chemical industry and energy

OVERVIEW

Purpose

Where: Internal protection of tanks, retention pits, gutters.

What: Occasional or permanent contact with effluents, which may be radioactive or not, acid or basic, in energy production sites or chemical industries.

Which: Steel or concrete structures.

Description

Product: solventfree epoxy-novolac, C.M.R.'s free.

Use:

- either as a direct single coat,
- either as a topcoat of an epoxy-fibre reinforced structure such as one of the « perl » range.

Typical thickness: according to specification: from 500 to 800 microns.

Application in one vertical coat: up to 500µ with an airless pump, or 300µ with a roller.

Properties and benefits

Chemical and nuclear performance:

Exceptional inertia to a very large number of mineral and organic acids at ambient temperature: please consult us.
Decontamination test: report nr 06/07 by CEA Saclay.

Application properties:

To take advantage of a simple and cost effective standard spraying machine.

Surface properties:

Aspect : uniform and seamless glossy surface.
Result : very easy to clean, no weak areas.

Compliance with safety and regulatory requirements:

SV101 *is solventfree,* flash point (cc): > 90°C/194°F for optimal safety and minimized application constraints.
It is *aromatic amines, phtalates and styrene free* for compliance with current regulations.

CHARACTERISTICS

Packaging

• In 2 separate cans, pre-adjusted for 12 kg.
Proportions, *by weight*: base 1 / hardener 1

Storage conditions

• 18 months max, in the original cans, never opened,
• Under shelter,
• At temperatures of between 0°C/32°F and 35°C/95°F[(1)],

[(1)] *which might increase or decrease by 10°C/50°F, once only during a 5 days max transport time to destination.*

Colours

Beige, approaching RAL 1015.

Finish

Glossy with limited chalking and yellowing in operation, *especially if implementation requirements are respected.*

Reinforcements

Please consult us.

V.O.C. content

52 g/l (maximum), according to ISO 11890-1 (P1-M2)

Composition

Resin	:	novolac-epoxy
Hardener	:	non-aromatic polyamine
Pigments	:	synthetic oxides
Solvent	:	none

Specific gravity (mix) at 20°C/68°F

1.30 ± 0.05 g/ml as per ISO 2811

Solids content (mix)

By weight	:	96–100% after 6 hrs maturation - ISO 3251
By volume	:	100% per calculation

Viscosity (mix) at 20°C/68°F

6 000 mPa.s ±1 000 ♦ 60 poises ±10

A slight evolution may happen during the storage period, without any effect on the application conditions.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tel : 33 (0) 3 44 49 86 22 – Web: www.maxperles.com

IMPLEMENTATION

Conform and controlled conditions
During application and hardening periods
Are necessary to obtain required quality

For all use:
Refer to relevant material safety data sheets as to risk sentences and safety recommendations

♦ Before:

Surface preparation

Steel after sharp edges have been smoothed, on abrasive blasted surfaces to Sa3 degree.
Average profile:
• In case of prior application of Varnish ED1 or Primer EDA (see data sheet):
Medium G or Rt 50-75µ.
• In case of direct application:
Rough G or Rt 100µ.
Our epoxy laminates, according to specification.
On specific recommendation: concrete impregnated with EDO, EDA Primer or Screenperl®: please consult us.
Always apply on clean and dry substrates

Products preparation

24 hours minimum before application, place the cans in a temperate area at 10°C/50°F min and 30°C/86°F max.

Application temperatures

Substrate:
3°C/37°F minimum above dew point,
With: 5°C/41°F at least ♦ 45°C/113°F at most.
Product:

While mixing:	10°C/50°F min ♦ 30°C/86° F max
Spraying at:	25°C/77°F min at hose exit
Manual use:	at mixing temperature

Mixing

• *Never make up partial mixtures*, in order to avoid the risks of incorrect proportions.
• Stir the base with a power mixer to an even consistency. Then, add hardener and continue stirring until a perfectly homogeneous mixture is obtained.

Conditions for use

• No maturing before use.
• Start the application immediately after mixing.
• Gelcoat SV101 *should never be diluted.*

Application

• Airless spraying unit, with a 45/l min pump ratio, fitted with heating hose.
• Or medium bristle roller, *in 2 passes*, with an interval of 2 to 6 hours between both at 20°C, *each one to be followed by smoothing the surface with a flat brush.*

During:

Pot-life of mixture

10°C/50°F	20°C/68°F	30°C/86°F
2 h 00	0 h 30	0 h 10

In case of long lasting spraying application, the hose should be cleaned once per hour with ED Thinner.

Number of coats

Horizontal application: 1
Vertical application: 2, *within the acceptable recoating interval*: see below.

Recommended thickness

500 to 800 microns, according to specification.
Thicknesses are proposed in agreement with the method of the International standard ISO 19840:
Do not exceed 30% above the maximum value, except for pre-touchups and local overcoatings.

Theoretical consumption

130 g/sqm per 100 microns thickness.
This theoretical value should be *20±5 % increased* to get it practical, according to nature of substrate and implementation method.
Note:
Consumption will increase of 100 to 300 g/sqm when surface temperature is < 20°C, making the product viscous with its contact.

Cleaning of application equipment

Thinner ED. Flammable product. Flash point (cf): 25°C.

♦ After:

Curing

t°	*Dustfree*	*Recoatable*
10°C	5 h 00	min 5 h 00 – max 8 h 00
20°C	2 h 00	min 2 h 00 – max 6 h 00
30°C	1 h 00	min 1 h 00 – max 3 h 00

Delay before use: 10, 7 or 4 days, depending on temperature.

Repairs

Report to our *Technical Advice nr 5*.

Max Perlès
advanced industrial coatings

data sheet
March 2022

fiberglass fabric

P45

Bi-axial E-glass fabric – 450 g/sqm

scope:
sealing

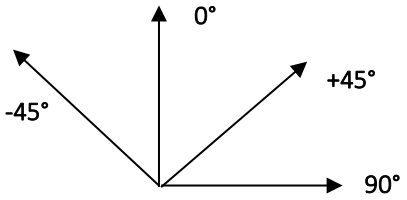
OVERVIEW

Description

Technical glass cloth, made of a sewed glass filaments complex, oriented + and – 45° and setted on a matt, with a *black* tracer wire to facilitate the breadth covering.
Exists in 20 cm large ribbon, 40 ml, under the ref. **R45.**

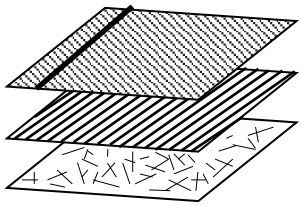
Purpose

Homogeneous reinforcement of epoxy coatings.



Properties and benefits

- Reinforcement to be drowned in an epoxy or vinylester matrix, ensuring the sealing.
- High mechanical performance.
- Excellent drapability.
- No longitudinal deflection.
- Easy implementation.



CHARACTERISTICS

Specifications

Axis angle	*Weight (g/sqm)*	*Tolerance*	*Fiber*	*Filament diameter*	*Finish*
Fabric +45°	187	± 5%	E-glass	12 - 14 µ	Silane
Fabric –45°	187	± 5%	E-glass	12 - 14 µ	Silane
Matt	100	± 5%	E-glass	-	-
Sewing	<10	± 5%	PE	78 dTex	-

Measurements (roller)

Length: about 40 ml
Width: 127 cm
Weight: about 25 kg
Surface: about 51 sqm

Thickness (breadth)

500µ, measured with a Palmer device.

Delivery

Rolled up: matt on external side on chuck.
Packing: in a polyethylene bag, each one in a box.

Storage conditions

Fears moisture.
Store in dry atmosphere, under shelter, in the original packing, at a temperature of between 0°C/32°F and 35°C/95°F[(1)].
Hydrometry while in storage :

- In the original packaging, never opened : < 90%
- After opening : < 50%

[(1)] *which might increase or decrease by 10°C/50°F, once only, during a 5 days max transport time to destination.*

Use conditions

Use in a non-condensing atmosphere and support, according to operating methods described in the *Technical Advice nr14.*

Replaces and cancels any former issue
The above mentioned information is given with objectiveness but cannot involve our companybeyond our manufacturer's responsibility.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

data sheet
March 2022

fiberglass fabric

P80

Bi-axial E-glass fabric – 800 g/sqm

scope:
sealing

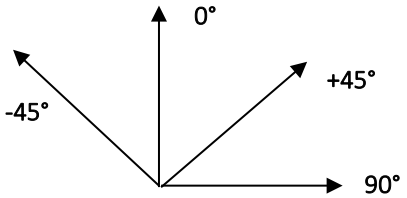
OVERVIEW

Description

Technical glass cloth, made of a sewed glass filaments complex, oriented + and – 45° and setted on a matt, with a *green* tracer wire to facilitate the breadth covering.

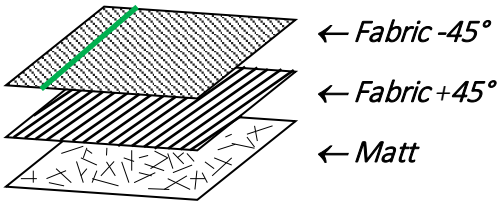
Purpose

Homogeneous reinforcement of epoxy coatings.



Properties and benefits

- Reinforcement to be drowned in an epoxy or vinylester matrix, ensuring the sealing.
- High mechanical performance.
- Excellent drapability.
- No longitudinal deflection.
- Easy implementation.



CHARACTERISTICS

Specifications

Axis angle	*Weight (g/sqm)*	*Tolerance*	*Fiber*	*Filament diameter*	*Finish*
Fabric +45°	350	± 5%	E-glass	12 - 16 µ	Silane
Fabric –45°	350	± 5%	E-glass	12 - 16 µ	Silane
Matt	100	± 5%	E-glass	-	-
Sewing	<10	± 5%	PE	78 dTex	-

Measurements (roller)

Length: about 24 ml
Width: 127 cm
Weight: about 25 kg
Surface: about 31 sqm

Thickness (breadth)

800µ, measured with a Palmer device.

Delivery

Rolled up: matt on external side on chuck.
Packing: in a polyethylene bag, each one in a box.

Storage conditions

Fears moisture.

Store in dry atmosphere, under shelter, in the original packing, at a temperature of between 0°C/32°F and 35°C/95°F[(1)].
Hydrometry while in storage :

- In the original packaging, never opened : < 90%
- After opening : < 50%

[(1)] *which might increase or decrease by 10°C/50°F, once only, during a 5 days max transport time to destination.*

Use conditions

Use in a non-condensing atmosphere and support, according to operating methods described in the *Technical Advice nr14.*

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

data sheet
March 2022

fiberglass fabric

P120

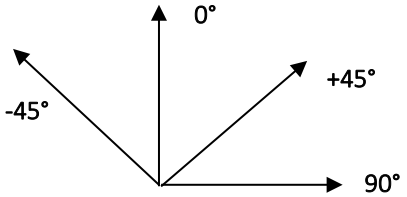
Bi-axial E-glass fabric – 1200 g/sqm

scope:
sealing

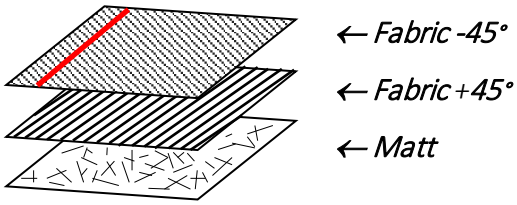
OVERVIEW

Description
Technical glass cloth, made of a sewed glass filaments complex, oriented + and – 45° and setted on a matt, with a *red* tracer wire to facilitate the breadth covering.

Purpose
Homogeneous reinforcement of epoxy coatings.



Properties and benefits
- Reinforcement to be drowned in an epoxy or vinylester matrix, ensuring the sealing.
- High mechanical performance.
- Excellent drapability.
- No longitudinal deflection.
- Easy implementation.



CHARACTERISTICS

Specifications

Axis angle	*Weight (g/sqm)*	*Tolerance*	*Fiber*	*Filament diameter*	*Finish*
Fabric +45°	550	± 5%	E-glass	12 - 17 µ	Silane
Fabric –45°	550	± 5%	E-glass	12 - 17 µ	Silane
Matt	100	± 5%	E-glass	-	-
Sewing	<10	± 5%	PE	78 dTex	-

Measurements (roller)
Length: about 16 ml
Width: 127 cm
Weight: about 25 kg
Surface: about 21 sqm

Thickness (breadth)
1000/1200 µ, measured with a Palmer device.

Delivery
Rolled up: matt on external side on chuck.
Packing: in a polyethylene bag, each one in a box.

Storage conditions
Fears moisture.
Store in dry atmosphere, under shelter, in the original packing, at a temperature of between 0°C/32°F and 35°C/95°F[(1)].
Hydrometry while in storage :
- In the original packaging, never opened : < 90%
- After opening : < 50%

[(1)] *which might increase or decrease by 10°C/50°F, once only, during a 5 days max transport time to destination.*

Use conditions
Use in a non-condensing atmosphere and support, according to operating methods described in the *Technical Advice nr14.*

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Web : www.maxperles.com

Appendix 3
Technical Advices

Technical Advice No. 1
"Specification for preparation of concrete"

Technical Advice No. 2
"Specification for preparation of steel substates"

Technical Advice No. 3
"Performance testing"

Technical Advice No. 4
"Dielectric testing"

Technical Advice No. 5
"Retouching"

Technical Advice No. 7
"Engraving of a laminate"

Technical Advice No. 14
"Application of fiberglass/epoxy laminates"

Technical Advice No. 21
"Mechanical fixing in one piece of laminates"

Max Perlès
advanced industrial coatings

Technical Advice Nr.1

September 2021

Specification for preparation of concrete

Scope :

This document describes:

- the necessary requirements, in terms of substrate surface condition, to undertake coating work, new or remedial.
- the products to use and measures to take if such requirements are not fulfilled.
- the sequence of steps to implement.

It does not cover the structural state or strength of the concrete substrate, which is presumed to comply with all applicable norms, rules and regulations (see list at the beginning of our Technical Manuals) .

Requirements :

Drying of new or refurbished substrates :

- New concrete:

28 days minimum, depending on temperature and ventilation.

- Mortars and water based renders:

Refer to the indications provided in the manufacturer's relevant product data sheet.

Substrate aspect :

- Uniform and smooth, free of sharp edges and/or cavities exceeding 0.5 mm from the average level. The profile must have a roughness of between CSP 3 to 5 of concrete surface profiles according to the ICRI (International Concrete Repair Institute).
- The air holes in fresh concrete must be filled up when the casing is released, without yielding a glossy surface.

Laitance :

Is absolutely prohibited, as are pure cement finishes.

Substrate cleanliness:

- Casing release agents and additives must be eliminated.
- Substrate must be free of loose particles and of any pollutants such as paint, oil, grease and wax – which would be harmful to the adherence of the coating. It must be vacuum cleaned very carefully to eliminate dust .

Water infiltration and counter-pressure:

Install drainage solutions or apply specific treatment – see following page .

Substrate reconditioning to fulfil these requirements :

Implementation conditions:

Make sure the ambient conditions for each operation are in accordance with the relevant product data sheets.

Presence of laps, edges, scrapes, etc:

Grind off and vacuum the dust.

Light laitance, traces of pure cement, oil and other pollutants:

Lightly clean off, using fine grade abrasives with limited pressure or light waterjet. Vacuum the dust and/or dry off.

Thick laitance, pure cement finish, fresh cast concrete:

Carefully sandblast using fine grade abrasives with limited pressure, or adapted waterjet. Vacuum the dust and/or dry off.

Repair :

Mortars and other products used for the repair of the concrete must be chemically compatible with Max Perlès coatings , must be fast-setting and checked against the risk of them creating a difference in potential between old and new concrete parts .

Apparent steel reinforcement must be passivated before being covered over : carefully brush off loose oxydes and passivate using our modified epoxy PRIMER W.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Web : www.maxperles.com

Specification for preparation of concrete

and mortars or water based renders

Dry substrate:

Impregnate with one coat of EDO PRIMER or of SCREENPERL®, waterborne epoxy.
Double the coat in case of high porosity.

Damp substrate:

Impregnate with one coat of EDO PRIMER or of SCREENPERL®, in order to neutralize moisture. To be repeated two or three times in case of moisture re-sweating.

Air holes in cast concrete / coarse trowelling:

The surface must be rendered with our AR100 RENDER, a solvent-free epoxy charged with silica, in one or two coats.

Damaged surface with deep cavities:

Fill with AR100 RENDER, in successive passes up to 2 cm thick each, after adding in silica F15 , if necessary , to constitute a mortar (up to 1 for 1 in weight).

Stabilized cracks (*) and passive concrete overlaps:

- Bridge them over with a 5 to 10 cm wide plasticized adhesive tape
- Then reinforce them:
  - by applying a fiberglass fabric strip 20 cm wide, saturated with the appropriate Max Perlès epoxy resin and sprinkled while progressing with SB0 SILICA SAND , when under a single-layer watertight coating
  - by implementing the fully-adherent multi-layer coating system directly in the case of waterproofing .

Un-stabilized cracks (*) and active concrete overlaps:

As above, adapting the width of the bridging as well as the nature and weight of the local or general reinforcement according to the width of the crack.

(*) *according to French standard NFP 95-103.*

Sequence :

- Grinding
- Blasting
- Dust removal
- EDO PRIMER or SCREENPERL®
- AR100 RENDER
- Bridging/reinforcement
- Coating

Particular case :

Counter-pressure:

Can be accepted, in the case of a reinforced waterproof coating, for a value of up to 0.5 MPa (5 bar). Value obtained according intern method CEBTP.

Max Perlès
advanced industrial coatings

Technical Advice Nr.2

September 2021

Specification for preparation of steel

Scope

This document describes:

- the necessary requirements, in terms of substrate surface conditions, to undertake coating work , new or remedial.
- the products to use and measures to take if such requirements are not fulfilled.

It does not cover the structural state or strength of the steel substrate, which is presumed to comply with all applicable norms , rules and regulations.

Requirements

Preparation of sheet steel :

Must be to degree P2 as per standard NF EN ISO 8501-3.

- Barbs, scratches or weld projections must be eliminated by chipping and grinding.
- Sharp edges and weld beads must be rounded by grinding.

Environmental conditions:

- *All coating work must be undertaken at ambient temperature within the range indicated in the product data sheet of the chosen coating.*

Appropriate air heating or, symetrically, air cooling and ventilation equipment must be used if necessary.

Work in cold weather on an open air surface is not recommended.

- *Always operate at a difference of at least +3°C / + 38°F between the measured temperature of the steel substrate and the dew point – see standard NF EN ISO 8502-4.*

Use appropriate air heating, or deshydratation equipment if necessary.

ISO 12944 recommendations should be applied.

Blasting:

- **Before:** if using solid abrasive material, check that it is of appropriate quality and not damp, check that the blasting equipment is operational and that air pressure at the nozzle is sufficient to cover pressure losses.
- **Implementation:** by sand blasting or hydro blasting or combined blasting until the profile and the roughness specified in our system sheet is obtained.
- **After:** vacuum-dust very carefully and eliminate all abrasive deposits , including those on the scaffolding .

The residual dust content on the steel surface is measured according to ISO 8502-3 and must not exceed category 2.

The soluble salt content on the steel surface is measured according to ISO 8502-6 and 9 and must be lower than 50 mg/sqm.

Primer:

Immediately after blasting and before any re-oxidation, apply a 30 microns dry film thickness stand-by coat of Varnish ED1 or Primer EDA, colorless epoxies , *unless our specification stipulates direct application of the coating on the blasted steel.*

Specific points

Sheet holes:

Before applying the coating , fill all holes and craters with Render AR100, solventfree epoxy.

Floating roof tank strut supports:

After blasting and prior to any coating, screw struts one by one and stick in place 5 mm thick prefabricated reinforced epoxy plates using Render AR100 .

Precut to a size slightly smaller than the one of the metallic reinforcement plates which may exist.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

Technical Advice
Nr.3
August 2019

Performance testing

Scope

This document describes the tests that must be done to carry out the reliability of the coating implementation.

They take place: . during the application,
. after the application.

Testing during application

- Environmental conditions:

While progressing with humidity and temperature recording devices, placed and moved depending on work progress to ensure at all times that the dew point is not reached and the temperature ranges are met.

- Wet film thickness:

At each coat, using a calibrated notched gauge, while progressing and at least once every sqm.

- Consumption:

It is complementary to the thickness test and detects any possible discrepancy in real time.

- Aspect :

Permanent verification that bubbles or "pinholes" do not appear and that the film presents a uniform and homogeneous surface.

Testing after application:

- Dry film thickness on metallic surfaces:

After physical "drying", using a magnetic sensor device, calibrated under the conditions defined by the standard ISO 19840.

- Polymerization:

After 48 hours minimum (at 20°C // 68°F), by a test, with white cotton rubbed once on the film onto which a few drops of acetone were deposited: cotton should not show any trace of the coating colour.

- Porosities:

Verification of the coating's dielectric sealing following the method described in our *Technical Advice nr.4* "Dielectric testing" by sweeping all the coated surfaces with an electrical brush adapted to the substrate.

In case of linings reinforced with fiberglass fabric, this test is carried out on the laminate before topcoat is applied.

If the laminate is implemented on an old supposedly insulating coating, it is necessary to apply a coat of conducting interface beforehand: ref. Interface CF.

It is also possible to test the topcoat independently if a coat of the same Interface CF has been applied between the two layers.

Please consult us.

Repairs:

If necessary, all tests must be followed by the appropriate corrective actions:

– immediately, if tests are carried out during the application

or

– as described in our *Technical Advice nr.5* then re-tested in case of tests carried out after application.

ISO 9001 certified since 1996
4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

Technical Advice
Nr.4
August 2019

Dielectric testing

Scope

This document describes the operation to be carried out to detect perforations, porosities, micro-cracks, conductive inclusions or other defects in a waterproof coating, whether applied on concrete or on steel.

Principle

With the substrate connected to ground, test the integrity of the coating by sweeping its surface with a continuously powered "brush" or "broom" probe:

A *yellowish-white electric arc* is created in case of perforation or conductive inclusion in the coating, accompanied by a sharp audible signal.

Note: When this control is done on a laminated coating, a bluish glow can be observed due to surface ionization, accompanied by a continuous buzz of the device. This phenomenon is not in itself indicative of porosity. It can be eliminated by reducing either the tension or the sensitiveness of the equipment .

Conditions

Time limit :

Dielectric testing should be performed at least 48 hours (when ambient temperature is around 20°C // 68°F), or 72 hours (at around 15°C // 59°F) , after coating application.

If the coating is multi-layered, glass-tissue reinforced, this test is carried out on the coating before the topcoat (finishing coat) is applied.

If the coating is being applied on a previously-existing , supposedly insulating coating, it is necessary to apply a coat of our conductive interface CF onto the old coating before proceeding with the new coating.

It is also possible to test the topcoat only if a coat of this Interface CF is applied between the reinforced laminate and the topcoat.

Equipment

ELCOMETER or similar.

Steps

1. Connect the equipment to ground using the ground wire
2. Power up and test the charge
3. Calibrate the equipment:

Connect the brush or broom fibers with a surface of bare concrete or of bare metal and progressively increase the voltage until an audible or luminous error signal is obtained. The indicated value at this point is considered as the tare, and must be added to the control voltage defined by the coating thickness – see NF EN ISO 29601 standard and paragraph 4 below.

4. Set the equipment to the appropriate voltage:

Film thickness:	*Test voltage:*
0,5 mm	2,9 kVolts
1,0 mm	5,5 kVolts
1,5 mm	8,5 kVolts
2,0 mm	11,7 kVolts
3,0 mm	17,0 kVolts
4,0 mm	22,5 kVolts

5. Perform the test :

After checking that the coating is dry and clean, the operation is carried out at a constant speed of about 5 linear meters/min :

- with a broom for large flat surfaces
- with a brush for corners and in areas with irregular profile.

The yellowish-white arc together with the sharp audible signal indicate the presence of perforations or conductive inclusions in the coating.

Defects detected this way are marked out for later repairs as per our *Technical Advice nr.5.* Once corrected, they too will be checked according to the same process.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

Technical Advice
Nr.5
August 2019

Retouching

Scope

This document describes the steps to carry out localized repairs in the following cases:

- Correction, after polymerization of the coating, of areas showing porosity, appearance or hardness defects, insufficient thickness, etc.
- Repair of accidental mechanical or chemical damages.
- Reinstating the watertightness of the coating when it has been drilled through by chemical plugging to install equipment fittings.

Implementation conditions

Environmental conditions, including temperature and humidity, must be those specified in the relevant product data sheets.

Surface preparation

- Clearly delimitate the areas to be repaired by surrounding them with adhesive tape at a distance of 5cm from the damaged or faulty spot.
- Totally eliminate the coating inside the delimited area, back to the substrate, by grinding.
- Re-create the same roughness as originally both on the bared substrate and on the adjacent undamaged areas, using appropriate mechanical means, in order to provide optimum adhesion of the new coating.

Cleaning

Must be done on all prepared areas, ensuring elimination of pollution, dust or heterogeneous particles.

Retouching

Use the same coating products as initially implemented, under the same conditions.

- In the case of an originally airless-sprayed topcoat or single coat :

  - homogeneous or open surfaces:

Apply the new coating using the same machine/pump as originally, after having protected the surrounding surfaces in order to avoid the deposit of spray mist or “overspray” which can cause surface roughness which, in turn, would complicate ulterior cleaning operations and reduce the sanitary characteristics of the coating.

  - small or difficult to access surfaces :

Apply the new coating using a flat nylon brush, followed, if necessary, by smoothing with a spalter brush.

- In the case of an originally roller-brush applied coating :

Proceed exactly in the same way as with the original coating.

At the end of the retouching operation

Remove the delimiting adhesive tape as soon as the retouching operation is finished.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

Technical Advice
Nr.7
August 2019

Engraving of a laminate lining

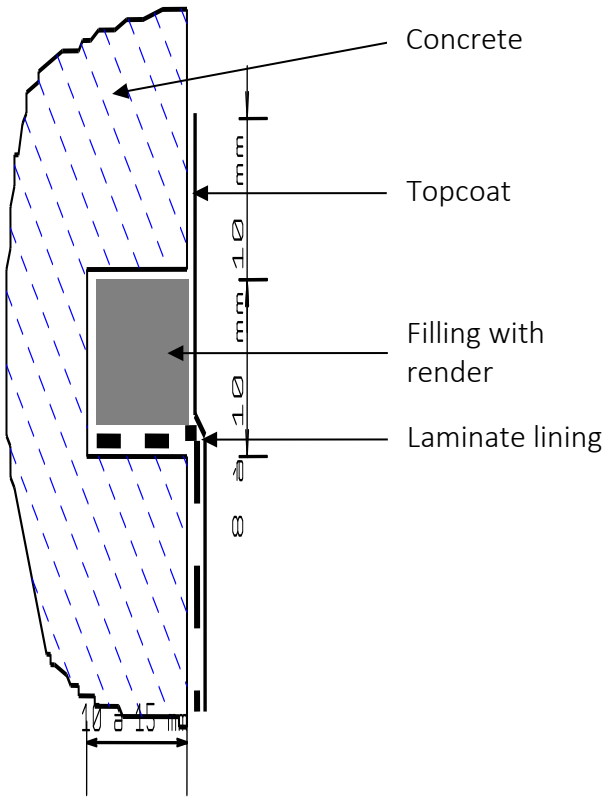
Scope

This document describes the operations to be carried out to insert a laminate coating into an engraving serving as the end of the area to be coated.

Operation

- Prepare the substrate according to the system specified and to our Technical Advices.
- Trace the limits of the engraving.
- Create a regular engraving 10 to 15 mm high or wide and 10 to 15 mm deep, by any appropriate mechanical means.
- Vacuum-clean carefully of dust.
- Place an adhesive protection starting 10mm away from the engraving, on the side which won't be coated.
- Press the reinforced laminate (topcoat excluded) into the underside of the engraving and sprinkle with Silica sand.
- Fill the engraving with AR100 Render.
- Check for any defects (such as glass fibers standing out), correct and repair.
- Apply the topcoat fully over the engraving, and until the adhesive protection is reached.
- Pull off the adhesive no longer than 10 minutes after the topcoat application.

Sketch



4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Max Perlès
advanced industrial coatings

Technical Advice
Nr.14
August 2019

Implementation of fiberglass/binder laminates

Scope

This document describes the operations to perform to obtain a homogeneous, reinforced, waterproof epoxy or vinylester coating.

Process

1. Prepare, before starting the operation, the required quantities of fiberglass, taking into account the necessary 4 inchs / 10 cm wide overlaps and all specific cuts to be done to deal with singular points (curves, rivet lines, seams, columns, penetrations, …)

2. Make sure that the application work is going to be carried out in the environmental and usage conditions prescribed in the product data sheet.

3. Proceed with the laminate application, making sure no interruption of more than 0h30 to 3 hours [1] occurs between any two steps:

- Apply a first, *impregnation,* coat of the selected resin, using a medium-bristle roller or an airless spray gun, as per the quantity specified in the system sheet.

- Unroll and lay-out the fiberglass tissue or mat onto the resin.

- Debubblize carefully by strongly cross-rolling the tissue or mat with a debubbling roller [2] until a homogeneous impregnation is obtained. The resin's colour must come up through the tissue/mat, more or less strongly depending on the type and weight of the fiberglass (tissue or mat), knowing that for example a 300 g/sqm fiberglass tissue will "sweat" more, and more easily, than a 900 g/sqm fiberglass mat.

- Apply a second, saturation, coat of the same resin, using a medium-bristle roller or an airless spray gun, as per the quantity specified in the system sheet, preferably using new cans to benefit from a maximum period of use.

- Debubblize again to ensure the resin's penetration through the fibers. At this stage, the surface aspect must be perfectly homogeneous and uniform.

4. If specified in the system sheet being used, repeat the operation, depending on the number of fiberglass layers specified, using each time the *saturation* coat of the previous ply as the next ply's *impregnation* coat. Shift the layers of fiberglass by half a width in order to spread out the zones of overlapping.

5. If specified in the system sheet being used, mechanically sprinkle the still-wet saturation coat, while progressing, with 400 g/sqm of Silica sand (100/300 microns in particle size for our reference F15 , 100/600 microns for our reference SB0), respecting a minimum distance of 1m between the spray nozzle and the laminate. This in order to obtain a uniform surface roughness for proper topcoat adhesion. Use a low-pressure sand pistol.

NB: *Taking into account the dispersion resulting from the projection, prepare to use an effective quantity of 600 g/sqm of silica sand on horizontal surfaces, 800 g/sqm on vertical surfaces and 1000 g/sqm on roof undersides.*

6. Proceed in the same way on adjacent areas, being sure that overlaps is 10cm on previous tissue or mat.

7. After drying, sandpaper or very softly grind off all areas that stand out, such as fiberglass overlaps, for example, and then thoroughly vacuum away any dust.

8. Carry out a general review of the coating in order to detect any defects, as per our *Technical Advice nr.4 " Di-electric Testing "* and proceed with any corrections and repairs as per our *Technical Advice nr.5 " Retouching "*.

9. Apply the specified topcoat on the entire laminated surface, that must be non-condensing.

[1] *Depending on the resin used and the temperature of the substrate at the time of use: if in doubt, please consult us.*
[2] *Polyamide, Teflon or aluminum monoblock type rollers.*

Max Perlès
advanced industrial linings

Technical Advice
Nr.21
April 2022

Mechanical fixing of a laminate

Scope

This document describes the two usual methods of mechanical fixing of reinforced "anchored" laminated structures applied to non-metallic substrates.

Nature of fixing system

L.R.Etanco polypropylene plug Exco ∅ 32, 50 mm long is powerful, for multipurpose and easy to install:
It is a monoblock type piece to hit with a flat head and thin (thickness 2 mm). Its length can be adjusted depending on the substrate's nature and condition.

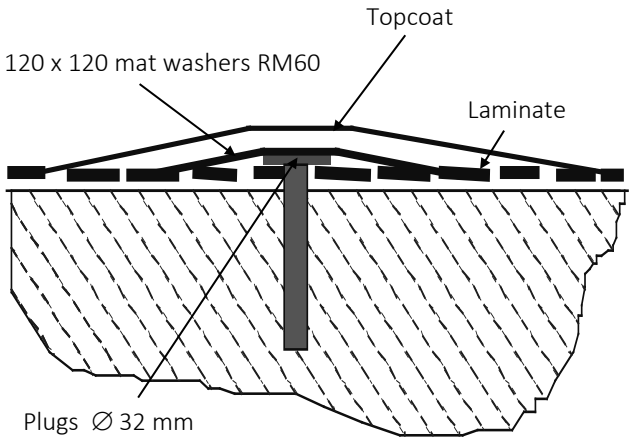
Criteria of method to use

The implementation on "dry" is simple and traditional.

The one on "wet" has the advantage of being faster, offers greater overall homogeneity and ensures an improved esthetic aspect with a less pronounced "bump" effect.

But, it requires coordination that does not make it applicable in all capacities.

Sketch



Principle

♦ Implementation on « dry » laminate:

– Apply the first or unique ply of laminate with specified reinforcement, and sprinkle with silica SB 0.

– Dry 6 to 24 h mini. depending on ambient temperature.

– Use a circular drilling machine to drill holes at the nominal plastic plug diameter and corresponding depth in a way to respect the mesh specified, generally every 50 cm in each direction, 5 to 6 per sqm.
The operation must start in a top corner or on a reinforcement overlap making sure that the plugs are always positioned on the overlap, independently of those positioned between them. Avoid drilling less than 20 cm from the corners.

– Blow holes with air.

– Use a hammer to fit the plastic plug.

– Reinforce each head with a mat washer RM60 ∅ 12 cm, impregnated with coating 20g/washer, applied and then debubbled and saturated with 10 g/washer, and sprinkled with silica SB 0 while progressing.

NB: *in case of multiple plies*, the implementation of the 2nd ply (and the 3rd ply if necessary) as per the method described in our *Techncial advice nr.14* replaces the mat washers.

♦ Implementation on « wet » laminate:

– Drill the same holes, **before** the beggining of the laminating, in the same quantity and within the specified mesh, as well as implementation instructions.

– Blow with air.

– Place a marker (nail) in each hole.

– Apply the laminate (through the nails).

– Fit the plastic plug **after** removing the marker which have pierced the laminate.

– Recover with a mat washer.

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Web : www.maxperles.com

Max Perlès

Waterproof , Watertight and Protective coatings

Appendix 4
Reference List

Max Perlès
revêtements techniques industriels

References list

waste water & desalination

4 rue du Professeur Dubos – BP 80439 – 60119 Hénonville Cedex (France) – Tél : 33 (0) 3 44 49 86 22 – Fax : 33 (0) 3 44 49 85 00 – Web : www.maxperles.com

Solventfree

epoxy coatings
ST100, AR100, LP100

and vinylester
SV100

Period 1978 - 2004

1978 – 1988

DEGREMONT *pour VILLE DE RIYADH (ARABIE SAOUDITE)*
3 stations de traitement des eaux –
Fosses à effluents *1978*

ELF FRANCE *RAFFINERIE DE FEYZIN (69)*
Réservoir d'eaux résiduaires pH 3 à 12 *1982*

PROCTER ET GAMBLE *– MECHELEN (BELGIQUE)*
Réservoir - Eaux usées *1984*

COMPAGNIE GENERALE DES EAUX *– LA FLECHE (72)*
Réservoir de préparation de traitement des eaux - Eau industrielle *1985*

STATION D'EPURATION DE SAINTE SUZANNE *(25)*
Digesteur : sous-face de coupole – méthane + H2S *1986*

CECA *– FEUCHY (62)*
Cuve de traitement - Eaux résiduaires *1987*

SNCF *– ROMILLY (10)*
Réservoir - Eaux résiduaires *1987*

OISA *– MERKSEM (BELGIQUE)*
Réservoir - Eaux usées *1987*

STATION D'EPURATION DE MONTBELIARD *(25)*
Digesteur : sous-face de coupole – méthane + H_2S *1988*

MICHELIN - USINE DE LADOUX *– CLERMONT FERRAND (63)*
Bassin de décantation - Eaux usées *1988*

1989

VILLE DE BELFORT *(90)*
Station de traitement et de refoulement : Cuve de neutralisation

COMPAGNIE GENERALE DES EAUX *– HUNINGUE (68)*
Poste de relevage - Ballon : Eaux usées

INTERCOM *– AALST (BELGIQUE)*
Réservoirs - Eaux usées

ANGLIAN WATER AUTHORITY *(GRANDE-BRETAGNE)*
2 réservoirs - Eaux usées

1990

DEGREMONT/LYONNAISE DES EAUX *– EPINAL (88)*
Silo à neutralite

ATOCHEM *– SAINT AUBAN (04)*
Vis Fly - Eaux résiduaires

LYONNAISE DES EAUX SOGEST *– THANN (68)*
Station de filtrage de FELLERING (68) - Filtre à neutralite

STATION D'EPURATION DE BELFORT *(90)*
Digesteur : sous-face de coupole – méthane + H2S

1991

SOCIETE DES EAUX DE L'EST *– CARLING (57)*
2 réservoirs semi enterrés - Eaux industrielles

CIBA GEIGY *– HUNINGUE (68)*
Fosse de réception - Eaux résiduaires

COMMUNE DE GUEMAR *(68)*
Caniveau d'aération - Eaux usées

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
TRAITEMENT FINAL DES BOUES
ACHERES III : Bâche à effluents
Puisards à effluents
Château d'eau - Eau industrielle

STATION D'EPURATION D'AGROCANET *– CANET (34)*
Bassin tampon - Eaux usées
Bassin d'aération - Eaux usées
Cuvettes de rétention - Effluents chimiques

1992

COMPAGNIE GENERALE DES EAUX – OTV
STATION D'EPURATION D'ANTIBES (06)
Tours de désodorisation des gaz

FRANCE ASSAINISSEMENT – DOUAI (59)
2 caniveaux de décanteur - Eaux usées

S.I.A.R.O.V.
STATION D'EPURATION DU CARRE DE REUNION – SAINT CYR L'ECOLE (78)
Digesteur : sous-face de coupole – méthane + H_2S

STRACEL – STRASBOURG (67)
Clarificateur d'eaux résiduaires

VILLE D'HYERES (83)
Fosses de relevage HIPPODROME, POUSSET, CEINTURON : Eaux usées

1993

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
TRAITEMENT FINAL DES BOUES
ACHERES IV : Bâche à effluents

LYONNAISE DES EAUX – USINE DE CROISSY (94)
Goulotte de récupération des boues

S.A.P./SECTION D'ASSAINISSEMENT DE PARIS (75)
Collecteur St BERNARD : Cunettes - Eaux usées

COMPAGNIE GENERALE DES EAUX – MONTCEAU LES MINES (71)
Fosse de rétention chlorite

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
TRAITEMENT FINAL DES BOUES
ACHERES III : 3 flottateurs - digestion
2 bâches - maillage
2 flottateurs – maillage

1994

SEVESC – GENNEVILLIERS (92)
Collecteur d'eaux usées du tronçon amont av. de Verdun/COURBEVOIE (92) : Cunettes

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
TRAITEMENT FINAL DES BOUES
ACHERES II : 2 flottateurs
2 bâches - Maillage
1 bâche - Boues digérées
2 bâches - Boues fraîches

COURLY - COMMUNAUTE URBAINE DE LYON (69)
Collecteur de COUZON AU MONT D'OR (69) - Eaux usées

STATION D'EPURATION DE SCHWINDRATZHEIM (67)
Epaississeur de boues
Regard de pompage intermédiaire
Local de déshydratation : Caniveaux - Eaux usées

STATION D'EPURATION DE MENTON (06)
Fosses de rétention - Produits chimiques

D.E.A. – ROSNY SOUS BOIS (93)
Collecteur d'AUBERVILLIERS à la COURNEUVE (93) : Cunette - Eaux usées

COMMUNAUTE URBAINE DE CHERBOURG (50)
STATION D'EPURATION D'EQUEURDREVILLE-HAINNEVILLE (50)
Digesteur : sous-face de coupole – méthane + H_2S

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
TRAITEMENT FINAL DES BOUES
ACHERES IV : Fosse de rejet - Eaux usées

COURLY - COMMUNAUTE URBAINE DE LYON (69)
Collecteur de la rue P. DELAURE :
Cunettes préfabriquées - Eaux usées

1995

COMPAGNIE GENERALE DES EAUX – STATION D'EPURATION DE MENTON (06)
Tours de désodorisation

LYONNAISE DES EAUX - DEGREMONT
STATION D'EPURATION DE SOPHIA ANTIPOLIS (06)
Dessableur, dégraisseur
Fosse de pompage - Eaux prétraitées
Bâches - Eaux résiduaires
Socle des tours de désodorisation Javel, soude
Fosse de rétention des tours acide, chlorure ferrique, Javel, soude
Caniveaux des tours acide, Javel et soude

VILLE D'OYONNAX (01)
Collecteur T210 de la rue de la gare : Cunettes - Eaux usées

STATION D'EPURATION D'AUBERCHICOURT (59)
Digesteur : sous-face de coupole – méthane + H_2S

LYONNAISE DES EAUX
STATION D'EPURATION SABAREGE/AMBARES BORDEAUX (33)
2 digesteurs : sous-face de coupole – méthane + H_2S
1 gazomètre

STATION D'EPURATION DE BARBEREY TROYES (10)
Bâches à boues

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
TRAITEMENT FINAL DES BOUES
ACHERES II : Salle des pompes - Murs

STATION D'EPURATION DE DIEPPE (76)
Fosse de rétention de la tour d'ozonation

LYONNAISE DES EAUX - DEGREMONT
STATION D'EPURATION DE SOPHIA ANTIPOLIS (06)
Bâches de stockage - Eaux usées
Fosses de relevage - Ciels gazeux - Eaux usées

1996

SYLA – STATION D'EPURATION D'ANNECY – ANNECY (74)
Fosse toutes eaux et fosse de dépotage - effluents pH 1
Fosse de stockage des graisses - Concentrateur à graisse - effluents pH 3
Epaississeur et stockeur de boues - effluents pH 5

S.A.P./SECTION D'ASSAINISSEMENT DE PARIS (75)
Quai de l'HORLOGE : Coude de cunette - Eaux usées

LYONNAISE DES EAUX - DEGREMONT
STATION D'EPURATION DE GRASSE/LA PAOUTE – GRASSE (06)
Fosses de relevage - Ciels gazeux - Eaux usées
Fosses de rétention - Chlorure ferrique, Javel, soude et acide sulfurique
Fosses de relevage - Eaux usées
Dessableur - Eaux usées

S.A.U.R. – PEUJARD (33)
Fosse de rétention - Eaux usées

STATION D'EPURATION DE COCA COLA – LES PENNES MIRABEAU (13)
Fosses de relevage - Ciels gazeux - Eaux usées
Fosses de rétention - Chlorure ferrique, Javel, soude et acide sulfurique

COMPAGNIE DES EAUX ET DE L'OZONE - OTV/DEGREMONT
STATION D'EPURATION DE CAP SICIE – TOULON (83)
Fosse de rétention - HCl 33 %

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
USINE DES EAUX
ACHERES III : Tour de répartition des boues
Bâche à boues
Vasques de digesteurs

STATION DE RELEVEMENT DE LA BECQUE – SAINT SEBASTIEN S/LOIRE (44)
Fosse de rétention - Eaux usées

S.I.A.E.P. D'ENSISHEIM (68)
Canalisations Ensisheim et Reguisheim - Eaux usées

1997

DEGREMONT - STATION D'EPURATION USINE SOCAR – *AUBAZINE (19)* *Acidogénèse et méthanogénèse - Effluents usine*

LYONNAISE DES EAUX – DEGREMONT
STATION D'EPURATION DE GRASSE LA PAOUTE – *GRASSE (06)*
Bassins d'aération - Eaux usées

COMPAGNIE DES EAUX ET DE L'OZONE - OTV/ DEGREMONT
STATION D'EPURATION DE CAP SICIE – TOULON (83)
Fosses de rétention - Hydroxyde de sodium
Fosses de rétention - Chlorure ferrique - Acide sulfurique

STEINER – STATION D'EPURATION – VERNON (27)
Bassins de traitement - Eaux usées

LYONNAISE DES EAUX - DEGREMONT
STATION D'EPURATION DE SOPHIA ANTIPOLIS (06)
Bassins d'aération - Ciels gazeux - Eaux usées

STATION D'EPURATION DE RHONE POULENC – ST AUBIN LES ELBEUF (76)
Décanteur (aéro-Accelerator) - Eaux résiduaires

OTV/ DEGREMONT - S.I.A.A.P – STATION D'EPURATION SEINE CENTRE – *COLOMBES (92)*
Stockeurs H_2S - Boues
Tours de désodorisation

OTV/ DEGREMONT - STATION D'EPURATION D'ARACHES (74)
Digesteur : sous-face de coupole – méthane + H_2S
Coagulateur
Floculateur
Epaississeur de boues
Stockeur de boues
Fosse de stockage des graisses
Fosse de rétention - Acide sulfurique
Fosse de rétention - Chlorure ferrique

S.A.P./SECTION D'ASSAINISSEMENT DE PARIS (75)
Collecteur du tronçon LA CHAPELLE/ PARIS 10e :
Cunette - Eaux usées

DDAF DE BEAUVAIS (60)
Bâche - Eaux usées

1998

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
USINE DES EAUX
ACHERES III : Tours de répartition des digesteurs A3/A4
Bâche du digesteur A3
Méthane + H_2S
ACHERES IV : Bâche de flottation - Boues
Bâches extérieures des tours de répartition - Boues
Décanteur nord-est
2 silos - Boues
Bâches d'homogénéisation n°1 et n°3

NESTLE – STATION D'EPURATION DE L'USINE – DIEPPE (76)
Goulotte de récupération du décanteur tertiaire -Eaux de rejet

OTV – STATION D'EPURATION DE ROUSSET (13)
Fosses de rétention - Acide chlorhydrique, chlorure ferrique, hypochlorite de sodium

COMPAGNIE GENERALE DES EAUX – STATION D'EPURATION D'ANTIBES (06)
Caniveaux et puisards - Eaux usées

SANOFI – MONTPELLIER (34)
Regards – Eaux usées

STATION D'EPURATION DE ROSNY S/SEINE (78)
Surverse de décanteur – Boues

DDAF DE L'OISE (60)
Bâche de récupération de LONGUEIL (60) - Eaux usées

SOUTHERN WATER AUTHORITY SNODLAND (GRANDE BRETAGNE)
HAM HILL TREATMENT WORKS
Digesteur : sous-face de coupole - méthane + H_2S

STATION D'EPURATION DU PERTUISET (42)
Fosse de rétention - Acide chlorhydrique

OTV – STATION D'EPURATION DE L'ISLE SUR SORGUE (84)
Dessableur - Eaux usées

1999

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
TRAITEMENT FINAL DES BOUES
ACHERES III : 2 bâches à boues

DEGREMONT/ORIL *– BOLBEC (76)*
Digesteur : sous-face de coupole – méthane + H_2S
Bassin tampon : eaux usées

RIVARD *– DAUMERAY (49)*
Cuves de camions d'assainissement - Eaux usées

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
USINE DES EAUX
ACHERES IV : 2 bâches biodagènes
2 bâches à tourbe
1 bâche intermédiaire 'homogénéisation
2 stockeurs
Décanteur Nord
12 bâches de surverse des décanteurs
ACHERES S : 12 bâches de surverse des décanteurs

2000

STATION D'EPURATION DU MANS *(72)*
Réservoir - Eaux usées

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
TRAITEMENT FINAL DES BOUES
ACHERES II : 3 bâches à boues

RIVARD *– DAUMERAY (49)*
Cuves de camions d'assainissement - Eaux usées

STATION D'EPURATION DE PARTHENAY *(79)*
Fosse de rétention - Acide sulfurique 92%
Fosse de rétention - Eau de Javel 48 CL
Fosse de rétention - Soude 30%

2001

SIAAP - STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
USINE DES EAUX
PRETRAITEMENT : Bâche Nutriox - 5e circonscription
TRAITEMENT FINAL DES BOUES
ACHERES III : Fosse de rétention du local des pompes
Fosse de rétention du bâtiment basse pression
ACHERES IV : Fosse de rétention du bâtiment haute pression
Fosse de rétention du bâtiment grenaillage - Usine des boues

OTV – STATION D'EPURATION DE MAXEVILLE *(54)*
Bâtiment désodorisation des gaz

SIAAP – USINE DE PRETRAITEMENT DE CHARENTON *(94)*
Fosse de rétention de la salle des machines

2002

SIAAP - STATION D'EPURATION SEINE CENTRE –
COLOMBES (92)
Bâche à boues - Bâtiment SPID

STATION D'EPURATION DE NEUVILLE EN FERRAIN *(59)*
Postes toutes eaux
Puits de pompage
Local réactifs
Rétentions et caniveaux au bâtiment désodorisation

SIAAP- STATION D'EPURATION SEINE AVAL – *ACHERES (78)*
USINE DES EAUX
CLARIFLOCULATION : Aire de dépotage chlorure ferrique
TRAITEMENT FINAL DES BOUES
ACHERES III : Salle des filtres
Bâtiment chaufferie

COURLY / COMMUNAUTE URBAINE DE LYON – STATION D'EPURATION DE MEYZIEU *(69)*
Répartiteur

STATION D'EPURATION HALIOTIS *– NICE (06)*
Clarificateurs et caniveaux

SIAAP - STATION D'EPURATION SEINE AMONT –
VALENTON (94)
Goulottes de digesteurs
Stockeurs de boues

2003

STATION D'EPURATION DE WATTRELOS – GRIMONPONT *(59)*
Bâtiment des Boues :
Réactifs condit. chimique
Rétention polymères
Rétention Javel /Soude
Rétention $FeCL_3$
Massifs sous tours de désodorisation

SIAAP - STATION D'EPURATION SEINE CENTRE – COLOMBES *(92)*
Aires de dépotage des réactifs $FeCl_3$, H_2SO_4, Javel

STATION D'EPURATION DE HOUPLIN ANCOISNE *(59)*
Bâche de préparation des sables et polymères du local technique
Bassin tampon
Postes de relevage d'eaux brutes et d'eaux pluviales
Regards et canaux d'arrivée des eaux brutes, pluviales et de l'effluent Cerestar
Canaux de tamisage et dégrillage
Canal de comptage amont
Fosses de stockage des graisses et des sables
Fosses de réception et de stockage des matières de vidange
Fosse toutes eaux du bâtiment des boues
Epaississeur
Bâche à boues du traitement tertiaire (actiflo)
Bâche à boues du flottateur
Répartiteurs amont et aval décanteurs primaires
Regards d'arrivée Cerestar
Cuve de rétention sous cuve $FeCl_3$
Cuve de rétention sous cuve H_3PO_4
Puisard d'évacuation des égouttures du local de bio désodorisation
Canal de comptage aval
Locaux de dégrillage amont
Locaux des pompes à sables et graisses du prétraitement
Locaux de pompage des boues primaires
Local de reprise des boues à partir du stockeur
Local du silo à chaux

COMMUNAUTE URBAINE MARSEILLE PROVENCE METROPOLE STATION D'EPURATION DE SORMIOU *(13)*
Tours de désodorisation des gaz

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES *(78)*
USINE DES EAUX
PRETRAITEMENT : Fosse de rétention du bâtiment déminée

2004

STATION D'EPURATION DE FREYMING MERLEBACH *(57)*
Poste de refoulement

SIAAP - STATION D'EPURATION SEINE AMONT – VALENTON *(94)*
Bâches à boues
Fosses de rétention du bâtiment désodorisation
Bâche pyrolyse
Plénum de ventilation

COURLY / COMMUNAUTE URBAINE DE LYON – STATION D'EPURATION DE MEYZIEU *(69)*
Décanteurs lamellaires

LYONNAISE DES EAUX – MORSANG SUR SEINE *(91)*
Fosses de rétention

CIBE – BRUXELLES *(BELGIQUE)*
Collecteur d'eaux usées

DEGREMONT – STATION D'EPURATION DE ROUMEGUIERES – GRASSE *(06)*
Bâche de recyclage
Filtres
Fosse de rétention $FeCL_3$ - H_2SO_4 - soude - Javel

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES *(78)*
USINE DES EAUX
CLARIFLOCULATION : Fosse de rétention $FeCl_3$ du bâtiment
TRAITEMENT FINAL DES BOUES
ACHERES IV : Fosse de rétention du bâtiment filtre presse

Solventfree

epoxy coatings
BIOPERL

and vinylester
CHEMPERL

Since 2005

2005

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI [1] : CLARIFLOCULATION : Sol du bâtiment
LOCAUX ELECTRIQUES : Sol
ACHERES III et IV : Extérieur des dômes des digesteurs
UPBD [2] : ACHERES IV : Bâche à boues
Sols des ateliers machines
Sols des filtres-presses
LABORATOIRE : Sol du bâtiment

VIVENDI WATER / MILLENIUM – LE HODE (76)
Station de traitement des eaux :
Ouvrages de clarification : effluent neutralisé – pH 7,5 à 9,5:
suspension de gypse maxi 250 g/l – t. 47°C (maxi accidentelle 58°C)

DEGREMONT / STATION D'EPURATION LA RICHE – TOURS (37)
Bâche à boues

SIAAP - STATION D'EPURATION SEINE AMONT – VALENTON (94)
Bâche tampon des réactifs sous aire de dépotage de H_2SO_4 et Javel

STEREAU / STATION D'EPURATION DE VITROLLES (13)
Fosse à matières de vidange
Fosse de rétention acide sulfurique
Fosse de rétention eau de Javel
Fosse de rétention hydroxyde de sodium
Fosse de rétention trichlorure de fer
Stockeur de boues (flottateur)

SIAAP- STATION D'EPURATION SEINE CENTRE – COLOMBES (92)
Aire de dépotage des boues
Sol du local pesée
Sol de la salle des refus

STATION D'EPURATION D'ARGELES (66)
Tour de désodorisation acide

STATION D'EPURATION MARBELLA – BIARRITZ (64)
Clarificateur

POSTE DE RELEVAGE – FREJUS (83)
Fosse eaux usées urbaines

[1] Antérieurement : Usine des Eaux
[2] Antérieurement : Traitement Final des Boues

2005 (cont'd)

SIAAP - USINE DES EAUX DE CLICHY (92)
Sol du local archives
Sol du local broyeur
Sol du local compacteur
Sol du local pesée

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°8 : sous-face de coupole – méthane + H_2S

SIAAP - PUITS DES CORMAILLES – IVRY SUR SEINE (94)
Chambre des vannes

POSTE DE RELEVAGE – SAINT TROPEZ (83)
Fosse eaux usées urbaines

STATION D'EPURATION COCA-COLA – BIERNE (59)
Fosses de rétention acide sulfurique et soude

2006

STATION D'EPURATION DE SIX FOURS (83)
Fosse de récupération eaux usées et eaux pluviales

DEGREMONT / STATION D'EPURATION LA RICHE – TOURS (37)
Digesteur n°1 : sous-face de coupole – méthane + H_2S
Digesteur n°2 : sous-face de coupole – méthane + H_2S

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI [1]
ACHERES III : Gazomètre
NITRIFICATION : Aire de dépotage des réactifs
Aire de dépotage méthanol
Bâches à boues flottées
Bâches à centrats
Bâches de reprise
Caniveaux
Carneaux d'air
Flottateurs
Fosses de rétention bisulfite de sodium et soude

STATION DE RELEVAGE – ANTHEUIL PORTES (60)
Puisards

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°4 : sous-face de coupole – méthane + H_2S

2006 (cont'd)

COMMUNAUTE URBAINE DE BORDEAUX
STATION D'EPURATION CLOS DE HILDE – BEGLES (33)
Bâches des boues digérées
Bâches des boues épaissies
Bâche des boues physico-chimiques Epaississeur
Digesteur : sous-face de coupole – méthane + H_2S
Fosse à graisses
Fosse à matières de vidange
Poste toutes eaux
Stockeur de boues digérées

D.H. WILAYA D'ALGER
STATION D'ÉPURATION DE BARAKI – ALGER (ALGÉRIE)
Bassins d'aération
Bassins de contact
Clarificateurs
Décanteurs
Dessableurs /Déshuileurs
Digesteurs : sous-face de coupole – méthane + H_2S
Epaississeurs

2007

SIAAP – STATION D'EPURATION SEINE MORÉE - USINE DE LA BRICHE – ÉPINAY-SUR-SEINE (93)
Sol de la salle des bennes

STATION D'EPURATION AMPHYTRIA / CAP SICIE – TOULON (83)
Fosse de rétention FeCl3

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI [1] *PRETRAITEMENT : Zone dégrillage, plateforme et cage d'escalier*
CLARIFLOCULATION : Sol dit de la « Cour anglaise »
DESODORISATION : Sol du bâtiment
ACHERES IV : Coursives des flottateurs
UPBD [2] *Fosse de rétention fuel*

OTV / STATION D'EPURATION DE ROUSSET (13)
Fosses de rétention acide phosphorique, acide citrique, ammoniaque, $FeCl_3$, chlorite de sodium.

ALTIS – CORBEIL ESSONNE (91)
Décanteur à boues EUID S126

[1] *Antérieurement : Usine des Eaux*
[2] *Antérieurement : Traitement Final des Boues*

2007 (cont'd)

SIAAP - STATION D'EPURATION SEINE AMONT – VALENTON (94)
Sphère biogaz

OTV - STATION D'EPURATION DE LA PIOLINE – AIX EN PROVENCE (13)
Fosses de rétention $FeCl_3$, soude, eau et extrait de Javel 40 et 60°GL, alcali,et H_2SO_4 98%

SIAAP - STATION D'EPURATION SEINE GRESILLONS I – TRIEL S/SEINE (78)
Sol du bâtiment chlorure ferrique - 1ère partie

STEREAU / STATION D'EPURATION DE VITROLLES (13)
Bâche à boues
Fosse à matières de vidange
Fosse de rétention des réactifs

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°7 : sous-face de coupole – méthane + H_2S

S.I.A.A.P. - STATION D'EPURATION D'ACHERES IV (78)
Gazomètre n°2 : Intérieur et extérieur

STATION DE METHANISATION DE MONTPELLIER (34)
Bassins et caniveaux : effluents

STATION DE TRAITEMENT D'EAU POTABLE DE TAKSEBT (ALGERIE)
Bac de stockage de sulfate d'alumine 250 g/l, pH 2.5
Bac de stockage de permanganate de potassium 10 à 40 g/l, pH 7 à 9
Bac de stockage de charbon actif 50 g/l

VIVAQUA BELGIQUE
QUAI DE MARIEMONT A MOLENBEEK SAINT JEAN (BRUXELLES)
RUE CHARLES PARENTE (BRUXELLES)
Collecteurs d'eaux usées

2008

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
PRETRAITEMENT : Aire de déchargement Nutriox
Sol du bâtiment des graisses
Sol de la désodorisation du bâtiment des graisses

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°1806 : sous-face de coupole - méthane + H_2S

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
ACHERES IV : Gazomètre n°2 Extérieur/Intérieur de la cloche du gazomètre et radier

RADEEMA - STATION D'EPURATION DE MARRAKECH (MAROC)
Digesteurs (x2) : sous-face de coupole - méthane + H_2S

STATION D'EPURATION DE CORBEIL (91)
Gazomètre aérien : Intérieur de la cloche

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
PRETRAITEMENT : Rétention FeCl3

SIAAP - STATION D'EPURATION SEINE GRESILLONS I – TRIEL S/SEINE (78)
Sol du bâtiment chlorure ferrique – 2è partie

OTV / STATION D'EPURATION DE LA PIOLINE – AIX EN PROVENCE (13)
Rétention Javel, FeCl3, NaOH, H_2SO_4

D.H. WILAYA D'ORAN
STATION D'ÉPURATION D'ORAN (ALGÉRIE)
Digesteur : sous-face de coupole - méthane + H_2S

SIAAP – STATION D'ÉPURATION SEINE AVAL - USINE DE PRETRAITEMENT DE LA FRETTE – ACHERES (78)
Bâtiment dégrilleurs : Sol et murs

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°1803 : sous-face de coupole – méthane + H_2S

2009

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
PRETRAITEMENT : sol du bâtiment des graisses
ACHERES III : sol de la salle des pompes
goulottes des décanteurs primaires CP1 et CP3
ACHERES IV : goulottes des décanteurs primaires CP2, CP4, CP6 et CP8

SAUR / STATION D'EPURATION DE BOURG D'OISANS (38)
Rétention FeCl3

OTV / STATION D'EPURATION DE BONNEUIL (94)
Gazomètre

SIAAP - STATION D'EPURATION SEINE CENTRE – COLOMBES (92)
Tours de désodorisation de la file 1 : n°1, 2(*), 3(*) et 4 (*) en AR100/MD6

SAUR / STATION D'EPURATION DE MOUTIERS (73)
Rétention FeCl3

OTV / STATION D'EPURATION D'ALBI (81)
Digesteurs (x2) : sous-face de coupole - méthane + H_2S

SIAAP - STATION D'EPURATION SEINE GRESILLONS I – TRIEL S/SEINE (78)
Sol de la salle traitement des sables
Sol de la salle des pompes

OTV / STATION D'EPURATION DE HYERES (83)
Bâche à boues digérées
Digesteur : sous-face de coupole - méthane + H_2S
Plénum d'air vicié
Réception et stockage de matières de vidange
Rétentions réactifs : FeCl3, soude, Javel, acide sulfurique, acide phosphorique

SIAAP – STATION D'ÉPURATION SEINE AVAL - USINE DE PRETRAITEMENT DE LA FRETTE – ACHERES (78)
Sol du bâtiment arrivée des émissaires

VINCI ENVIRONNEMENT / STATION D'EPURATION DE MONTEUX (83)
Bâche à membrane Ultrabox
Bâche de vidange Ultrabox
Fosse électrolyse des graisses
Rétention dépotage réactifs

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°1805 : sous-face de coupole - méthane + H_2S

2010

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
PRETRAITEMENT : Sol du bâtiment désodorisation
ACHERES III : Gazomètre
ACHERES IV : Sol et murs des galeries

COMMUNAUTE D'AGGLOMERATION DE LA ROCHELLE
STATION D'EPURATION DE PORT NEUF (17)
Tour de désodorisation biologique
Bassin tampon

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE LA FARFANA – SANTIAGO (CHILI)
Digesteur n°1802 : sous-face de coupole - méthane + H_2S

STATION D'EPURATION DE JERSEY – ILE DE JERSEY
Bâche à boues

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
DERU – Bâtiment Fiabilisation :
Bâche à boues épaissies BID 20-21
Bâche à boues primaires BID 22-23
Bâtiment KB02 :
6 bassins membrane KBE 20 à 25
Bâtiment KBE66 :
Bâches à boues 51-52-53
Carneaux d'air vicié
Bâtiment KC01 :
Plénum 26-50 et 29-35
Bâtiment KC01 et KC02 :
Rétention réactifs KCD 32-33-34
Bâtiment KB03 :
Bâche toutes eaux KBE42
Bâches à boues flottées KBE45 et KBE50
Bâche d'arrivée KBE58-60
Fosse échangeurs KBE57
Bâche de dégazage KBE41 et KBE49
Bâche à boues communes KBE48
Surverse et répartiteurs flottateurs KBE51, KBE52 et KBE53

STATION D'EPURATION DE VALLOUISE (05)
Bâche à eaux usées

SIAAP - STATION D'EPURATION SEINE GRESILLONS I – TRIEL S/SEINE (78)
Bâtiment C10 : Sol de l'atelier

OTV – STATION D'EPURATION DE SAINT LAURENT DU VAR (06)
Zone bassin biologique sud : sous-face de couverture des décanteurs

2010 (cont'd)

STATION D'EPURATION DE CHAMBERY (73)
Fosse toutes eaux

STATION D'EPURATION DE LAVAL (53)
Digesteurs (x2) : sous-face de coupole - méthane + H_2S
Stockeur des boues primaires
Stockeur des boues digérées

OTV – STATION D'EPURATION DE LA PIOLINE – AIX EN PROVENCE (13)
Bâche à boue extérieure
Bâche à boues de stockage épaissies
Bâche de surverse
Fosse toutes eaux

COMMUNAUTE URBAINE DE BORDEAUX
STATION D'EPURATION DU CLOS DE HILDE – BEGLES (33)
Stockeur 61 : sous-face, et Petite fosse

2011

STATION D'EPURATION DE CHAMBERY (73)
Prétraitement : Décanteur lamellaire
Bâche de floculation
Fosse toutes eaux

STATION D'EPURATION DE BRIOUDE (43)
Prétraitement : Poste de relevage
Dégrilleur

SYNDICAT D'ASSAINISSEMENT COLLECTIF DU CANTON DE L'OISANS (38)
Regards d'eaux brutes et pluviales

COMMUNAUTE URBAINE DE BORDEAUX – STATION D'EPURATION LOUIS FARGUE (33)
Postes toutes eaux
Rétentions et massifs
Fosses dépotage et traitement
Rétention chlorure ferrique

S.E.M. 12 - STATION D'EPURATION D'ESPALION (12)
Fosse de dépotage
Fosse de traitement des produits de curage
Rétention chlorure ferrique

2011 (cont'd)

***SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
UPEI
DERU – Bâtiment KB02 :
Bassins KBE20 à 25
Cheminée d'air vicié KBE66
Bâtiment KB03 (R.T.O) :
Bâche d'arrivée KBE58 et 60
Fosse échangeur KBE57
Bâche toutes eaux KBE42
Bâtiment KB03 (Flottation) :
Bâche à boues flottées KBE46 à KBE50
Bâche de dégazage KBE47 à 49
Bâches à boues communes KBE48, KBD48, KBD51, KBD52
Répartiteurs flottateurs KBE51, KBE52, KBE53
Bâches surverses KBE56
Bassins flottation KBD54 et KBD56
Bâtiment KC01 :
Tours de désodorisation KCD20
Plénum niveau +26,5 KCD39
Plénum niveau +29,35 KCB17
Bâtiment KC02 :
Rétention des réactifs KCD27 à KCD29
Bâtiment KC03 :
Bâche de rétention KCD32 à 34
ACHERES IV : Sol des galeries

***SIAAP – USINE DES EAUX – CLICHY** (92)*
Cuve à fuel

***METROPOLE NICE COTE D'AZUR – STATION D'EPURATION SAINT-LAURENT DU VAR** (06)*
Bassins (x2) Biosep sud
Bâche à boues

DEGREMONT pour AGUAS ANDINAS
***STATION D'EPURATION DE MAPOCHO – SANTIAGO** (CHILI)*
Digesteur FE1C n°9 : sous-face de coupole - méthane + H_2S

2011 (cont'd)

***SIAAP - STATION D'EPURATION SEINE MOREE – BLANC MESNIL** (93)*
Bâtiment C :
Bassin tampon
Poste toutes eaux
Canal de distribution tamis
Bâche de comptage des eaux brutes
Canal de distribution de dégrillage
Bâtiment D :
Bâche de stockage des eaux sales
Bâtiment E :
Epaississeurs 1 et 2
Poste toutes eaux
Bâtiment F :
Local désodorisation
Aire de dépotage camions
Fosses de rétention des réactifs
Bâtiment G :
Bâches à boues primaires 1 et 2
Bâches de mélange 1 et 2
Bâches à boues épaissies
Poste toutes eaux
Bâtiment déminéralisation :
Caniveaux nord et sud

2012

***STATION D'EPURATION PAYS DE MONTMELIAN** (73)*
Prétraitement : Canal et bassin d'aération
Dégrilleur

***STATION D'EPURATION CHAMBERY METROPOLE** (73)*
Ouvrages hydrauliques : Bâche à boues
Bâche matières de vidange

***SYNDICAT MIXTE DU BASSIN DE L'OR – STATION D'EPURATION DE LA GRANDE MOTTE** (34)*
Bâches (x4) de relevage

***SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
UPEI :
ACHERES IV et V : Goulottes des flottateurs

***STATION D'EPURATION DE ROUSSET** (13)*
Bâches (x3) accidentelles d'effluents industriels

***COCA-COLA TOULOUSE** (31)*
Fosse de rétention de récupération des eaux de pluie

2012 (cont'd)

SIAAP – STATION D'EPURATION SEINE MOREE – BLANC MESNIL (93)
Local réactifs :
Poste de relevage
Salle des membranes
Bâtiment désodorisation :
Caniveau et gaine de ventilation
Bâche à boues

SIAAP - STATION D'EPURATION SEINE LES GRESILLONS II – TRIEL-SUR-SEINE (78)
Bâtiments C10 et C11 :
Sols
Bâtiment E23 :
Regard
Bâtiment D21 :
Caniveau

SIAAP - STATION D'EPURATION SEINE CENTRE – COLOMBES (92)
Tours de désodorisation de la file 3 :
tours acides n°1 et 4,
tours basiques n°2 et 3

2013

SIAAP - STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI :
PRETRAITEMENT :
Carneaux
Bâche à boues primaires
Bâtiment d'arrivée des émissaires : sol et murs
CLARIFICATION :
Aire de dépotage de chlorure ferrique

STATION D'EPURATION DE CUZCO (PEROU)
Bâche à boues n°1 à la chambre des boues

SIAAP - STATION D'EPURATION SEINE CENTRE – COLOMBES (92)
Tours de désodorisation de la file 4 :
tours acides n°1 et 4,
tours basiques n°2 et 3

SIAAP – STATION D'EPURATION SEINE MOREE – BLANC MESNIL (93)
Aire de dépotage d'acide sulfurique 98%, soude et thiosulfate

INEOS – MARTIGUES (13)
Station WWTP2 – Décanteurs (x2) à eaux industrielles

2013 (cont'd)

SIAAP - STATION D'EPURATION SEINE GRESILLONS II – TRIEL S/SEINE (78)
Rétention chlorure ferrique

AGUAS ANDINAS
STATION D'EPURATION DE TALAGANTE – SANTIAGO (CHILI)
Digesteur n°1 : sous-face de coupole – méthane + H_2S

STATION D'EPURATION DE CHAMBERY (73)
Prétraitement – caniveaux

STATION D'EPURATION DE ROUSSET (13)
Bâche à boues
Bassin d'homogénéisation

STATION D'EPURATION DE PONT DU CASSE (47)
Bassin d'aération

SIAAP - STATION D'EPURATION SEINE AMONT – VALENTON (94)
Digesteur n°1

COSAPI pour SEDACUSCO
STATION D'EPURATION DE CUZCO – SAN JERONIMO (PEROU)
Digesteur n°2 – méthane + H_2S

2014

STATION D'EPURATION DE TOURS – LA RICHE (37)
Bassin clarificateur n°1

CHU LA COLOMBIERE – MONTPELLIER (34)
Fosse eau et hydrocarbures

STATION D'EPURATION D'ESTANTENS – MURET (31)
Bâche à boues

SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI
Reprises bâches BDI 22 et 23
Massifs adoucisseurs
Prétraitement carneaux

SIAAP - STATION D'EPURATION SEINE AMONT – VALENTON (94)
Digesteur n°1(suite)

SIAAP - STATION D'EPURATION SEINE CENTRE – COLOMBES (92)
Tours de désodorisation de la file 2 :
tours acides n° 1 & 4
tours basiques n° 2 & 3

LIGNIERES DE TOURAINE (37)
Poste de refoulement

2014 (suite)

***STATION D'EPURATION DE LUXFER – GERFAL** (63)*
Décanteur
Stock boues + clarificateur

***AJINOMOTO EUROLYSINE – AMIENS** (80)*
Caniveau circulaire du décanteur

***SIAAP – STATION D'EPURATION SEINE GRESILLONS – TRIEL SUR SEINE** (78)*
Aire de dépotage méthanol
2 silos boues déshydratées.- Bâtiment B12
Rétention chlorure ferrique.

STATION D'EPURATION ISOLA 2000 – NICE (06)
Rétentions 3 locaux : ammoniaque, compostage – chaux éteinte.

STATION D'EPURATION DE CHACE VARRAINS (49)
Poste de refoulement PR2 & 3

2015

***SIAAP – STATION D'EPURATION SEINE AMONT – VALENTON** (94)*
Sequaris Bâtiment 11107 – Rétention FeCl3
Reprises dans stockeur

***SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
UPEI
PRETRAITEMENT :
- Bassins dessablement
FILE BIOLOGIQUE :
- Zones MCR, MMA et MMB
BATIMENTS CENTRIFUGATION :
- Désodorisation et Réactifs

***CENTRALE DE COGÉNÉRATION BIOMASSE – VIELLE SAINT GIRONS** (40)*
Fosse fumée et fosse de rétentions GTA et local électrique

***STATION D'EPURATION DE VILLENEUVE MAGUELONNES** (34)*
Décanteur en bassin d'orage

***EPAD OUEST PROVENCE - ISTRES** (13)*
Fosse des eaux usées de Saint Chamas

***STATION D'EPURATION DE PRESSIGNY** (37)*
Poste de refoulement

***UNITÉ DE VALORISATION ÉNERGÉTIQUE DE BENESSE MARENNE** (40)*
Complexe ACR
Fosse toutes eaux, locaux déminé, NH3, GTA, fosses transformateurs, stockage GTR

2015 (cont'd)

***SIAAP – STATION D'EPURATION SEINE GRESILLONS – TRIEL SUR SEINE** (78)*
Bâtiment E20 déshydratation – sol

***SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
UPEI
Bassins dessablement – chemins de circulation

***SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
UPEI – DERU
- Bâtiment TDJ – Bâche de surverses flottation KBE 56 – poste toutes eaux KBE 42
- Nitrification bâche JTC45

***STATION D'ÉPURATION DE RIEUX MONCHAUX** (76)*
Bassin d'aération – boues activées

***TAMISIER ENVIRONNEMENT – ISLE SUR LA SORGUE** (84)*
Unité de bio méthanisation – Liquéfacteur

***VILLE DE CAUMONT** SUR DURANCE (84)*
Poste de relevage de la station d'épuration

SIGDO KOPPERS pour AGUAS ANDINAS
STATION D'EPURATION DE MAPOCHO 4 – SANTIAGO
(CHILI)
Digesteurs C et D : sous-face de coupole – méthane + H_2S

2016

RATP – LIGNE 7 CLICHY – PARIS
Égouts

***SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES** (78)*
Bassins membranaires Files A & B

***SIAAP – STATION D'EPURATION SEINE AMONT – VALENTON** (94)*
Bâche à écume
Digesteur DG3

***COOPÉRATIVE LÉGUMIÈRE « LA ROSÉE DES CHAMPS » - DOUE LA FONTAINE** (79)*
Cuve de méthanisation

2016 (cont'd)

SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI
BATIMENTS CENTRIFUGATION :
Locaux JCC11 & JCC21
BATIMENT DÉSODORISATION :
Locaux JCD05, 02 et 03
BATIMENT REACTIFS :
Locaux JCR08, 09, 10, 12, 13, 15, 22, 23, 25
PRETRAITEMENT :
Chemin de circulation piétons et véhicules
Bassins de dessablement
Bandes de roulement des ponts
Carneaux zones PAZ 13 et AKD
Cuves de rétention divers effluents
Regards et caniveaux
Aire de dépotage

SIAAP – STATION DE POMPAGE – CROSNE (91)
Rétention eau de javel et soude

SIA – SYNDICAT INTERCOMMUNAL d'ASSAINISSEMENT – COGOLIN GASSIN (83)
Réhabilitation des prétraitements de la STEP de Font Mourier
- Canaux de dégrillage
- Dessableurs/dégrilleurs

SIAAP – STATION D'EPURATION SEINE GRESILLONS – TRIEL SUR SEINE (78)
Bâches à boues digérés

STATION D'ÉPURATION EDELWEISS – LE HAVRE (76)
Zone lamellaire canal de sortie des eaux usées
Puits de chute PRI
Regard PRI

DEGREMONT pour AGUAS ANDINAS
STATION D'EPURATION DE MAPOCHO 4 – SANTIAGO (CHILI)
Réservoirs de boues digérées : Voiles

STATION D'ÉPURATION DE SAINT-JEAN D'AULPS (74)
Stockage de boues
Zones de dépotage / stockage des réactifs (H2S04, NaOH et FeCI3)

VEOLIA – AIGUEBLANCHE (73)
Bâche à boues

SIAEP (SYNDICAT INTERCOMMUNAL D'ADDUCTION D'EAU POTABLE) MARCHE BOISCHAUT – SIDIAILLES (18)
Usine de Chamblan – bâches à boues

STEP DU REYRAN - Fréjus (83)
Ouvrages d'arrivée (5)

2017

SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI
PRETRAITEMENT :
Carneaux zones PAZ 13 et AKD
Cuves de rétention divers effluents
Regards et caniveaux
Aire de dépotage
PRETRAITEMENT 2ème Tranche :
15 Bassins de dessablement
Bandes de roulement des ponts
Chemin de circulations piétons et véhicules

COMMUNAUTÉ DE COMMUNES DU PAYS ROUSSILLONNAIS - STATION D'ÉPURATION DES BLACHES (38)
Fosses à graisses et matières de vidange
Postes toutes eaux
Bâche à boues épaissies
Poste de relevage nord et sud, puits d'équilibrage

STATION D'ÉPURATION DES SAINTES MARIES DE LA MER (13)
Poste de relevage
Dessableur, déshuileur et fosse à graisses
Réacteur désodorisation : relevage intermédiaire
Local boues
Aire de dépotage et dalle support FeCI3
Bâche à eau

MONISTROL SUR LOIRE (43)
Cuvelage du bassin de dépollution

SIAAP – STATION D'EPURATION SEINE GRESILLONS – TRIEL SUR SEINE (78)
Bâches à boues digérées

SITE du FAYET – FRONTENEX (74)
Bâches eaux sales

SYNDICAT INTERCOMMUNAL VAL D'ANZIEUX ET PLANCIEUX - MONTROND LES BAINS (42)
Bassin de stockage eaux usées

SIAAP - STATION D'EPURATION SEINE AMONT - VALENTON (94)
Vasques de digesteur

SAMRA WATEWATER TREATMENT - JORDANIE
Digesteur 1

VEOLIA – AIGUEBLANCHE (73)
Bâche à boues

MAPOCHO – CHILI
Digesteurs 1 et 2

2018

SIAAP – STATION D'EPURATION SEINE AVAL – ACHERES (78)
UPEI
PRETRAITEMENT 2ème Tranche :
15 Bassins de dessablement

SAMRA WATEWATER TREATMENT - JORDANIE
Drainage pit 101

SI DES BASSINS DE LA THEVE ET DE L'YSIEUX – COYES LA FORÊT (60)
Bassins PR7 & PR8

STEP INDUSTRIELLLE AQUAVAL – LE ROUSSET (13)
Bassin de clarification 1 & 2 – filière 2,
une aire de dépotage et une rétention

SIAAP MABOC SAV (78)
2 cuves NUTRIOX

SYNDICAT INTERCOMMUNAL VAL D'ANZIEUX ET PLANCIEUX - MONTROND LES BAINS (42)
Bassin de stockage

CC DU PAYS ROUSSILLONAIS – STEP DES BLACHES (38)
Station d'épuration 80000 EH

SIAAP ALFORTVILLE (94)
Bassins de l'Usine de prétraitement 1ère tranche - canal 3

CU GRAND PARIS SEINE ET OISE – STEP DES MUREAUX (78)
Canaux de prédégrillage et postes toutes eaux
Bâches à graisses
Fosse à flottant sedipac + trémie
Bâches à boues
Fosse de reprise de boues biologique
Canal de répartition
Epaississeurs
Aire de rétention et dépotage des réactifs

SIAAP COLOMBES (92)
Aire de dépotage

SIAAP ALFORTVILLE (94)
Usine de prétraitement – bassins

NIMES METROPOLE – STEP DE ST GILLES (30)
Bassin d'orage
Canaux
Dégraisseur / Dessableur

MAPOCHO – CHILI
Digesteur n°3

2018 (cont'd)

SYNDICAT PUY DES FOURCHES - VEZERE (19) – UNITE DE TRAITEMENT DES CARDERIES
Bâche d'eau sale
Rétention et aire de dépotage FeCl3

STEP DE BOURG D'OISANS – AQUAVALLEES (38)
Bâches à boues
Rétentions

2019

AXENS SALINDRE (30)
Bassin carbone

SIAAP ACHERES (78)
Sols Désodorisation Clarification
Local air Maboc

MEXIQUE – SAN LUIS POTOSI
Usine d'assainissement Dégraisseurs et Canaux latéraux

ST PRIEST (69)
Bâche coagulation homogénéisation

STEP DE MONT – COMMUNAUTE D'AGGLOMERATION CREIL SUD OISE (60)
Digesteur

STEP DE GINESTOUS – METROPOLE DE TOULOUSE (31)
Prétraitement – Digesteurs – Bâches et cuves
2ème Digesteur

STATION AMPHORA - METROPOLE TOULON PROVENCE MEDITERRANEE (83)
Rétention + aire de dépotage H202 50%

STEP DES MUREAUX – CU GRAND PARIS SEINE ET OISE (78)

STEP DE ST GILLES – NIMES METROPOLE (30)
Bassin d'orage – Canaux – Dégraisseur / Dessableur

STEP DE ST JORY – (31)
Canaux de dégrillage

SIAAP CHARENTON (94)
Fosse de désodorisation & Rétention

ARLANC (63)
Regard béton

2019 (cont'd)

***SIAAP ALFORTVILLE** (94)*
Usine Prétraitement Bassins

***SIAAP ACHERES** 3 (78)*
Bâtiment filtre presse
Reprise des sols
Sphère Biogaz

***STEP DE PERPIGNAN** (66)*
Rétentions
Fosse de l'aire de dépotage

***STEP DE BOURG D'OISANS** (38)*
Rétentions

***STEP DE PORT SAINT LOUIS** (13)*
Ouvrages d'arrivée

***STEP DE PORT DOUVOT** (25)*
Bâches – Postes toutes eaux – Fosse à graisse

MAPOCHO - CHILI
Digesteur 4

LA FARFANA - CHILI
Station de traitement d'Azote

SINFRA – COTE D'IVOIRE
Station de traitement PK 24

2020

***STEP DE PORT DOUVOT** (25)*
Bâches – Postes toutes eaux – Fosse à graisse

***SIAAP ACHERES** – Unité de production BIOGAZ (78)*
Atelier d'homogénéisation – Stockeur S2
Bassins TDJ

***CONSTELLIUM - ISSOIRE** (63)*
Bac de contrôle ultrason U101

***EIFFAGE – SEVADEC Calais** (62)*
Digesteur – cuves à jus – sols

***VILLE DE LIBOURNE** (33)*
Bassin de stockage effluents

***GTR7 MONTAUBAN** (82)*
Canalisations eaux usées

***STEP DE GINESTOUS – METROPOLE DE TOULOUSE** (31)*
Prétraitement – Digesteurs – Bâches et cuves
2ème Digesteur

2020 (cont'd)

***SI DES BASSINS DE LA THEVE – COYES LA FORET** (60)*
Bâches PR7 et PR8

***SIAAP ACHERES** 4 – UPBD (78)*
Bâtiment filtre presse

STEP de SAINT BERNARD – BAYONNE (64)

***GEP NICE** (06)*
Canalisations eaux usées

STEP de HYERES** (83) – **VEOLIA

***STEP DE PERPIGNAN** (66)*
Postes toutes eaux n°2

***STEP du HAVRE** (76)*
Densadeg

***SILA Synergie CHAVANOD** (74)*
Bâche toutes eaux

***STEP GALERIA** (20)*

2021

VILLE DE LIBOURNE (33)
Bassin des Tonneliers, IR Souchet et PR De Lattre de Tassigny

METROPOLE AIX-MARSEILLE (13)
STEP DE FOS-SUR MER – Zones A, B, C et prétraitement

SYNDICAT MIXTE GARRIGUE-CAMPAGNE (34)
STEP de St Hilaire de Beauvoir – local stockage réactifs

COMMUNE DE BOULLEVILLE (27)
Poste eaux usées

STEP DE BOEN (42)

STEP DE NIMES (30)

SIAAP ACHERES (78)
Aires de dépotage NIT, VBH-EZ-KCD42-001 & BIC 23

STEP DE LANDOUERRAT
Bassin d'aération

STEP FROMAGERIE GILLEY (25)
Bassin tampon

STEP DE JOUANAS (40)
Aire de dépotage

2021 (cont'd)

SIAAP SEINE AVAL – Achères (78)
Unité Biogaz – 11 digesteurs

SIAAP SEINE AVAL – Achères (78)
Décantation Primaire

SIAAP SEINE AVAL – Achères (78)
Décantation Primaire – Zone DP2

SIAAP SEINE AVAL – Achères (78)
Aire de dépotage