USE OF DRIZORO PRODUCTS

IN

WASTEWATER TREATMENT PLANTS

DRIZORO®
Construction Products

INDEX

1. INTRODUCTION

The aim of the present document is to describe the different ***DRIZORO*** products and systems, which are suitable for construction or repair and maintenance of Wastewater Treatment Plants.

Properly designed and precisely built concrete and reinforced concrete structures are only subjected to ageing process, so these structures are characterised by a long durability.

However, water/wastewater -often containing high levels of aggressive chemicals-, intensive infiltrations, mechanical damages, action of atmospheric factors (freeze/thaw cycles, sunshine, rainfalls, snowfalls), carbon dioxide and other harmful factors produce extremely hard working conditions for concrete structures. To increase the durability of these concrete structures an additional waterproof and protective coating must be applied.

The system for the waterproofing, repair and protection of concrete provides by ***DRIZORO*** enables a proper surface protection of concrete, masonry o metal structures in newly built constructions and a complete repair and surface protection for old constructions, which are damaged to a variable extent.

2. CONSTRUCTION OF NEW WASTEWATER TREATMENT PLANTS

This epigraph provides some ***DRIZORO*** products and systems for the following items:

- *Substrate preparation*. Before applying any waterproof or protective coating a previous substrate treatment be carried out in order to provide a good surface.
- *Complementary treatment for joints and outstanding points*.
  - Waterproofing procedure.
  - Protection against chemical attack and abrasion.
  - Flooring.
  - Anchoring of elements.

2.1. Substrate preparation

Surface to be coated must be clean and also free of dust, oils, paints or any material/substance, which can reduce the adherence of the waterproof coating or could have any negative influence on the adherence for the applied materials. A right surface preparation means a successful application for ***DRIZORO*** products (waterproof and protective coating, flooring systems, repair mortars and strengthening systems), and also provides a long durability. This substrate preparation consists of:

- Removal of damaged protective, maintenance or superficial coatings, as well as any dirt (grease, soot etc.);

- Removal of loose particles and layers of concrete, cream of concrete, dust, water;

- Removal all the substances that could affect negatively on the binding applied materials with concrete or on the corrosion of concrete and reinforcing steel.

The following surface preparation methods for concrete will be carried out depending on the necessity:

- *Mechanical methods* (especially recommended for epoxy-based materials):
  - Off-hammering the damaged concrete by means of the cold chisel, pneumatic drills, grinders, needle guns;
  - Removing the cream of concrete and any dirt by brushing, sandblasting, shot-blasting or surface milling.

- *Hydraulic methods* (recommended for materials that need a damp basement):
  - Hydrowatching: cleaning with clean water under the pressure of 60 – 120 MPa;
  - Hydrosandblasting: cleaning with clean water under the pressure of 6 – 15 MPa with addition of a grinding stuff, for instance the sand.

- *Thermal methods* (recommended for removing oils, lubricants and bituminous materials)
  - Acetylene-oxygen firing: At using this method it is necessary to clean the areas to be fire-treated by means of the mechanical or hydraulic method.

- *Chemical methods:*
  - Washing the surface of concrete with the solution of muriatic or phosphoric acid; After chemical treatment it is necessary to wash the surface completely;
  - Final dust-removing, just before application of the repairing materials comprises:
    - Dusting,
    - Out-blowing with compressed air or steam,
    - Washing with cold or hot water.

2.1.1. Surface preparation for cement-based coatings

Hydraulic methods consist of cold water spraying at high pressure by a high-pressure pump equipped with a spraying gun. Water must be clean and also the spraying procedure should be homogeneous and continuous over the whole surface. During the cleaning job, many damaged or weakly bounded areas are exposed which must be treated and refilled with any ***DRIZORO*** structural repair mortar.

Cleaning of the concrete surface with clean water at high pressure. The pressure range for the hydraulic equipment should be between 150 – 200 bar. Thus, a water jet is directly applied and in perpendicular way to the surface. The whole surface should be treated and also special attention should be paid in the reinforcing o metal elements. With this pressure range, a good concrete surface cleaning is achieved due to removing of superficial small aggregates. The final rough for this treated surface is very suitable for the application of any structural mortar or levelling and cosmetic repair mortar.

2.1.2. Surface preparation for epoxy-based coatings

If an epoxy system is applied, the concrete surface must be sound and strong, completely clean, free of dust and oils, and with slight roughness. Surface moisture content should not exceed 4%. In order to prepare this surface the ***DRIZORO*** technical document

"*Preparation of concrete surfaces for application of epoxy base coatings*" compiles the recommendations to be followed when preparing concrete surfaces that are going to be coated with epoxy coatings.

In general, the preparation of surfaces will include as first step the *limiting of areas* to be treated, and subsequently perform their *cleaning*. After these operations have been carried out, the necessary means to obtain a suitably *rough surface* depending on the type of material to be used and its particular placing technique must be available.

The surface must be clean, rough and free from weak elements or poorly bonded, such as superficial laitance, paints and any remains from previous repairs. Also, thermo hygrometric conditions (temperature and humidity) must be taken into account, in order that they are compatible with those of the material to be used and with the environment where the placing is going to be performed. Substrates in general must be completely dry (4% or less R.H.) when applying epoxy products, except in those cases of special formulations for damp substrates, for example specific bonding agents or anti-dust finishes so formulated.

Initial cleaning. Its purpose is to eliminate any remains of substances that diminish the adhesion between the concrete base and the epoxy. It means emulsifying and diluting the agents that generate the impurities. These impurities may be due to factors of many different natures: rust stains, grease, oil, paint, and vegetal remains, etc.

Rough surface. Surfaces to be coated must be, apart form clean, free from any weak product (cement laitance, fine sand) and from loose particles that cause a reduction of adhesion between the base and the epoxy. The purpose is to obtain a firm and rough surface. The preparation mechanical methods (chipping, needle gun, dry sand blasting, shot blasting, thermal stripping…) are applied after cleaning (if it has been necessary) always keeping in mind that if the surface has not been conveniently prepared, the epoxy will fail in the joint and the purpose of the proper application will not be achieved.

Once the surface to be waterproofed has been thoroughly cleaned, many damage zones, such as cavities, voids, honeycombs, peelings, cracks, fissures and non-structural steel (rods sticking out of concrete) can be exposed so they must be patched and repaired with any specific mortar. Any repair work for concrete is based upon the following specific materials:

- Anti-corrosion protection for reinforcement steel.
- Repair mortar

Concrete around all non-structural reinforcement steel elements must be removed and non-structural elements must be cut to a minimum depth of about 2 cm and then, the steel is coated with ***MAXREST PASSIVE®*** oxide converter and protector in order to passive the corroded metal surfaces.

After the chiselling out around the reinforcement steel elements, concrete defects such as cracks, fissures, gravel pockets or honeycombs must be patched and filled with a non-shrink, thixotropic, structural repair mortar:

- ***MAXREST®*****.** Quick setting time and application thickness up to 2,5 cm.
- ***MAXRITE® 500*****.** Quick setting time and application thickness up to 5 cm.
- ***MAXRITE® 700*****.** Normal setting time and application thickness up to 5 cm.
- ***MAXRITE® -S*****.** Long setting time and application thickness up to 5 cm (Manual/Spray methods).

These repair mortars have a high adhesion to concrete and to reinforcements so loads are transmitted onto the repaired structure. Also, these products have a very good thixotropy, which results in an application in successive layer with out slump. Its low porosity avoid the penetration of chemicals into the concrete and therefore, the corrosion process is slowed down.

Photograph 1.- Placing of ***MAXREST®***

Slab-wall joints should be opened with a chisel in a 3 x 4 cm size groove but avoiding the "V" shape and then filling it with ***MAXREST®*** if running water leaks are not present, or with ***MAXPLUG®*** if they are. Finally, groove should be finished in a shape of a cove. This procedure will provide a surface in order to control the layer thickness for the waterproofing coating (see Figure 1).

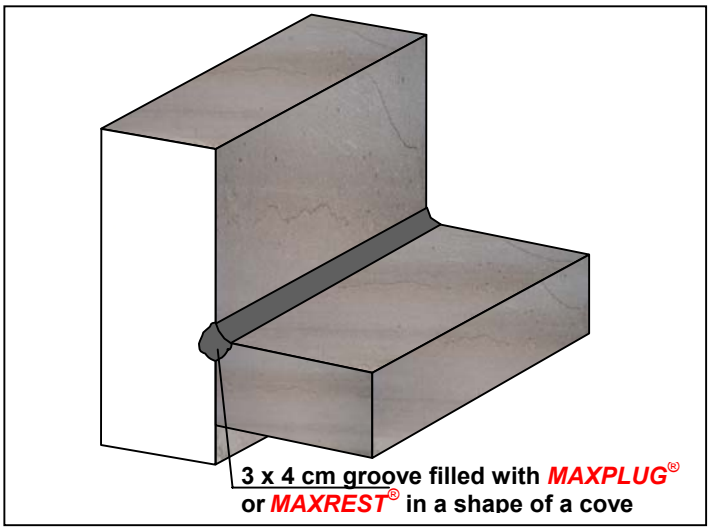


Figure 1.- Concave corners (concrete slab-wall joints) treatment

2.2. Complementary systems for joints and other outstanding points

Concrete joints are a break in concrete continuity where leaks may occur. These always require the application of special sealants. Possible leaks are usually due to mistakes in preparation (e.g. under-vibration of concrete, over-vibration of concrete, mechanical damages during concrete laying) or improper material or construction sealant (e.g. insufficient deformability, fast ageing, and fatigue of material rigidity). The most frequent dangers for tightness of a sealant are: improper design of expansion gap width, uneven settling, selection if an unsuitable, with regard to the needs, application of the waterproofing material and defects of concrete.

Sealing of joints in newly built structures consists of the application of a suitable sealant with the following requirements:

- Suitable deformability (low modulus).
- Stable elasticity in the operate temperature range.
- Waterproofness.
- High resistance to frost and salt action.
- High adhesion to the surface.

The most recommended sealants for expansion joints are polyurethane-based, polysulphide-based or cement-based products due to their flexible behaviour and consequently their ability of displacement absorption, good surface adhesion and durability. A polyurethane-based sealant cures in result of reacting with relative humidity of the air, whiles a polysulphide-based sealant is formed because of the base (resin) and the reactor, and cures in result of reacting both components after mixing.

Treatment of joints and outstanding points subjected to direct contact with water is a critical aspect on that a lot attention should be paid in order to ensure the good result for a waterproofing work and prolong the durability of the concrete structure. ***DRIZORO S. A.*** has developed two different groups of products for sealing of joints based on:

- Water-swelling profiles: ***HYDROTITE – LEAKMASTER*** Systems
- Elastic sealants: ***MAXFLEX-MAXJOINT*** Systems

HYDROTITE SYSTEM. This system is based on the following product:

- ***HYDROTITE*** ®. Water-swelling profile for sealing of joints and cracks subjected to permanent water immersion. Uses and advantages:
  Sealing of construction and expansion joints: channels, reservoirs, tanks, prefabricated elements, underground structures, etc.
  Sealing of cracks and leaks in concrete.
  Swells in contact with water up to eight times its original volume, sealing, filling and ensuring a full waterproofness.

MAXFLEX SYSTEM. This system is based on the following products:

- ***MAXFLEX® 100***. One component, elastomeric polyurethane-based adhesive sealant. Uses and advantages:
  Sealing of expansion joints in concrete and masonry structures.
  Waterproofing of joints in façades panels, curtain walls, exterior glazing, etc.
- ***MAXFLEX® 900***. Two component, low modulus, high chemical resistant, polysulphide-based, elastomeric sealant for permanent contact with water. Uses and advantages:
  Sealing of joints in concrete and masonry.
  High chemical resistance.
  Suitable for permanent contact with water.
- ***MAXJOINT® ELASTIC***. Elastic, two component, cement-based, repair and sealing mortar that has been specially designed for joints and cracks in concrete and masonry. Uses and advantages:
  Sealing of joints and cracks subject to movement.
  Suitable for wet surfaces: water reservoirs, channels, tanks, dams, ….
  Suitable for permanent contact with water.
  Cement-based product: Total compatibility with the substrate and also with the waterproof coating.

To avoid superfluous stresses in the joint that could occur due to its adhesion to the joint bottom, it is recommended to place a dilatation rod inside the joint. An ideal material for a dilatation rod is a polyurethane – closed cell type. ***DRIZORO*** offers the dilatation rod of various diameters called ***MAXCEL®***. The diameter of a dilatation rod placed manually in the joint needs to be 25% bigger than its width.

2.2.1. Treatment for joints

Generally a bad procedure is the origin when a running water leak is located in a joint. According to the type of joint some methods are provide to solve this problem:

- Joints during the concrete pouring process.
- Joints for cured concrete.
- Sealing and finishing of joints

There are two types of joints:

- Cold joints are produced during the non-continuous concrete pouring.
- Expansion joints in the reinforced concrete, which permit the separate segments of the structure frame to expand and contract with the temperature and moisture changes without adversely affecting the structural integrity or serviceability.

2.2.1.1. Joints during the concrete pouring process

During concrete pouring of the hydrotechnical structures, where ever an expansion joint is designed, a 30 mm x 5 mm groove shall be formed in the formwork, at least 10 cm from the finished level for water-swelling profile installation. Once the formwork has been removed, ***CJ-3030-M*** or ***CJ-2020-M HYDROTITE*** profile is glued into the existing groove using a polyurethane-based adhesive such as ***MAXFLEX® 100 LM*** or a water-swelling sealant such as ***Leakmaster in*** all of its length. Joints between the profiles are butt joined. Then, the usual semi rigid 20 mm thick polystyrene separations are placed, bonded to the first concrete with ***MAXBOND®*** bonding agent or with ***MAXFLEX® 100 LM*** strips, and the second concrete element is placed (see Figure 2).

For cold joints generated during the concrete pouring, a typical water-swelling profile such as ***CJ-0725-3K*** or ***DS-0620-4.5I HYDROTITE*** is bonded on the concrete surface using ***MAXFLEX® 100 LM*** (See Figure 4) or nails at 25-30 cm intervals (See Figure 3).

2.2.1.2. Joints in cured concrete

If any special waterproofing treatment for joints has not been taken into account during the concrete pouring process, this can be carried out according to the following procedures:

Expansion joints. Porexpan is removed to a deep of at least 100 mm and then a water-swelling circular profile ***RSS-1410-C*** or ***RSS-0806-C Hydrotite***, depending on the joint width, must be placed into the joint gap (See Figure 4). When repairing existing joints, internal surfaces must be cleaned and if it is necessary to repair the edges, use a structural repair mortar with high mechanical strengths such as ***MAXREST®*** can be used.

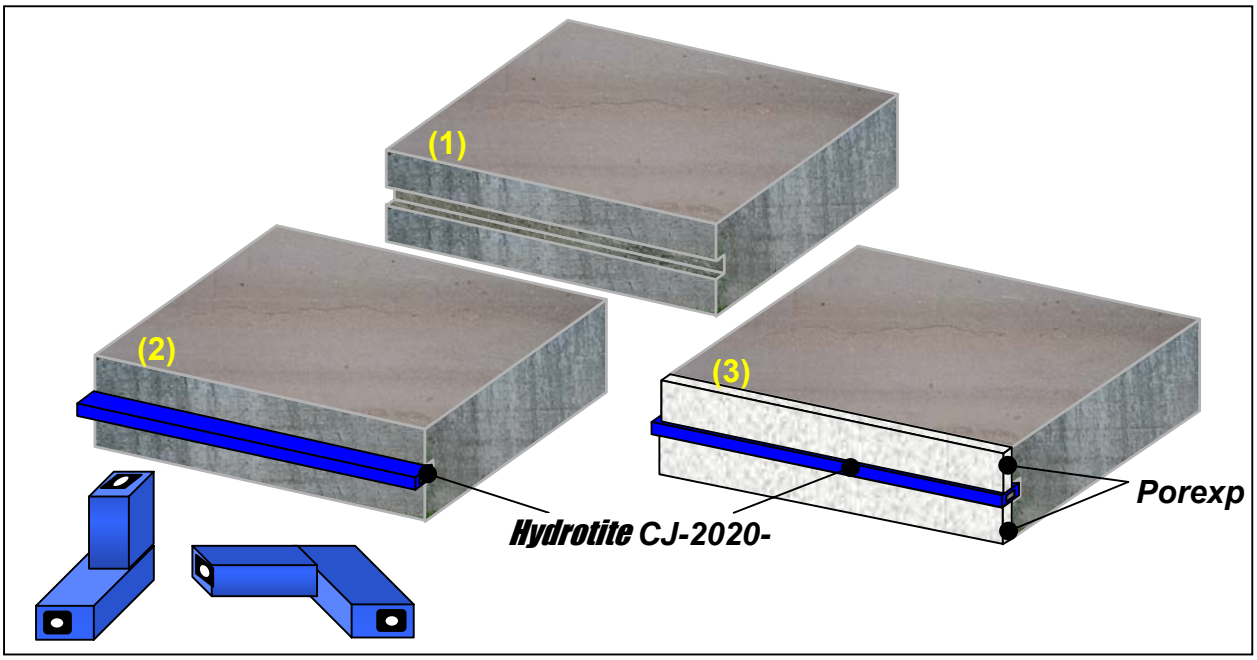


Figure 2. Placing of water-swelling profile for expansion joints during concrete pouring

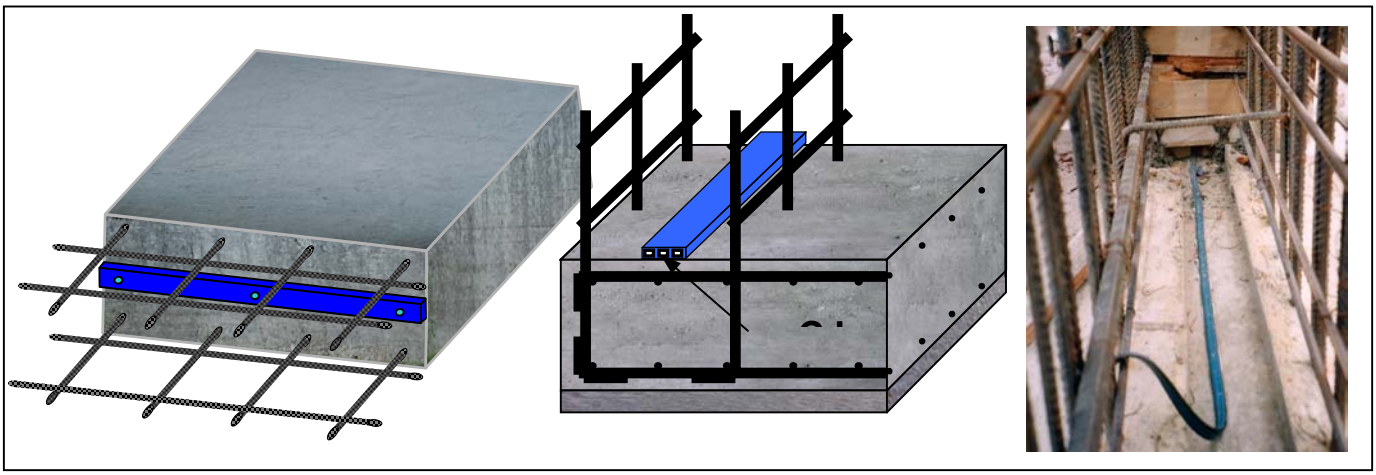


Figure 3. Placing of ***CJ-0725-3K or DS-0620-4,5l HYDROTITE*** for cold joints during pouring

Cold joints. These joints should be clean and opened at least to 2 cm deep with a thickness from 1 to 2 cm and then, patched with ***MAXREST®*** if running water leaks are not present, or with a quick-setting mortar such as ***MAXPLUG®*** if they are (see Figure 4).

Figure 4. A) Placing of water-swelling profiles for expansive joints in cured concrete. B) Repair of cold joints in cured concrete

When movements or vibrations are expected and once joint has been opened and the edges has been cut in perpendicular way to a minimum depth of 5 cm, joint must be sealed with a water-swelling sealant such as ***Leakmarter***. Finally, opened area is patched as above.

2.2.1.3. Sealing of joints

Expansion joints are critical points due to generate a lot of problems for the waterproofing job. In this way, most of the losses of water in any reservoir are due to a wrong performance of these joins between different concrete elements. Thus, sealing of expansion joint should be done before placing of any waterproofing coating.

The edges of the expansion joints should be properly cleared to a sound base and defects of concrete should be filled with ***MAXREST®*** or ***MAXRITE®***. Once repair jobs have been finished, expansion joints should be sealed with a suitable sealant. To calculate the most suitable joint width, the following general formula must be applied:

Joint depth to be sealed with sealant will not be less than half of the joint width

That is to say, a 2 cm wide joint will required a sealant depth of as least about 1 cm. It is also advisable to use a polyethylene foam joint backing rod such as ***MAXCEL®*** with a section diameter 1,25 times the joint width.

After hardening of repair mortars, expansion gaps should be filled with a suitable sealing material (expansion putty or elastic filler), which enables both parts of the structure to work on the scope of loads assumed, maintaining its tightness. For sealing of joints, any polyurethane-based sealant from ***MAXFLEX*** range or a flexible polysulphide-based sealant such as ***MAXFLEX® 900***, a suitable material for permanent immersion conditions with high chemical resistance and mechanical strengths, are recommended. Once joint has been cleaned, sand is placed on the water-swelling material to confine it and then the backing rod and sealant are placed (See Figure 5).

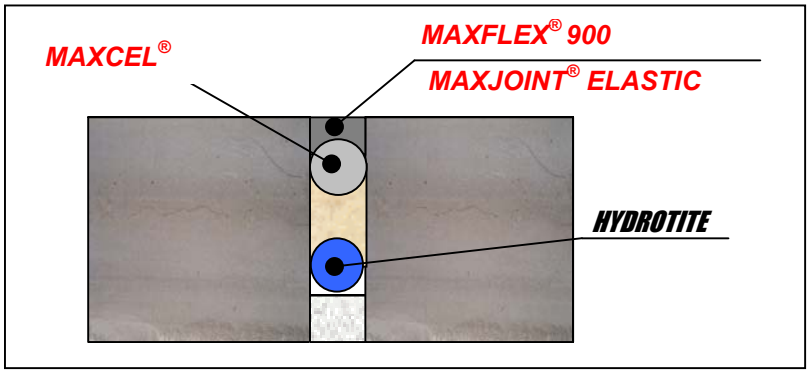


Figure 5.- Sealing of a repaired expansion joint

For sealing of expansion joints a flexible and cement-based sealant such as ***MAXJOINT® ELASTIC*** can be used (See Figure 6).

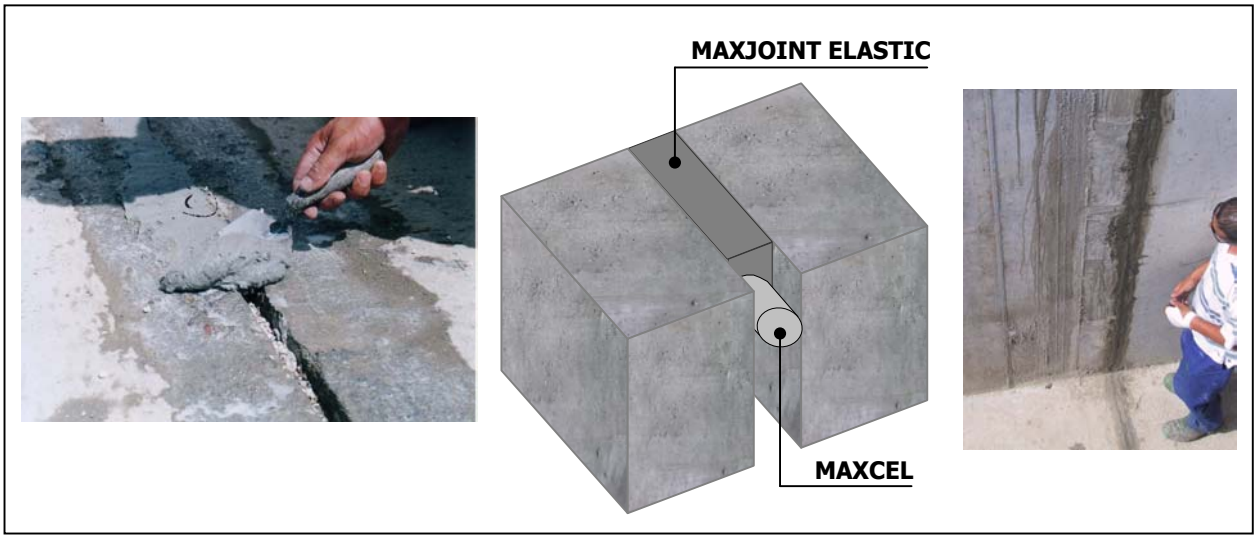


Figure 6.- Sealing of a repaired expansion joint

Sometimes both the width and the depth for expansion joints are too big to use any flexible sealant. In these cases, two procedures can be applied: rebuilding of joints or use elastic bands.

Rebuilding of joints. A suitable method for horizontal joints based on the use of a fluid mortar, which is poured into the joint gap. The joint to be rebuilt must be clean and a 2 cm thick porexpan layer is bounded on any internal surfaces of the joint and then, a bonding agent, ***MAXBOND®***, is applied onto the other surface. Finally, ***MAXGROUT®*** is be poured into in order to fill the gap (See fig. 7). Once grout is cured, finish the joint according to above procedures.

Figure 7.- Rebuilding of joints

Elastic sealing bands. This procedure is also suitable to waterproof expansion joints or cracks subjected to big movements. It is based on the use of an elastic system such as ***MAXFLEX® XJS***. This is an EPDM rubber band with lateral fleece edges, fixed to the substrate using a cement-based mortar, ***MAXSEAL® FLEX*** or an epoxy-based adhesive such as ***MAXEPOX® BOND – W*** (See Figure 8).

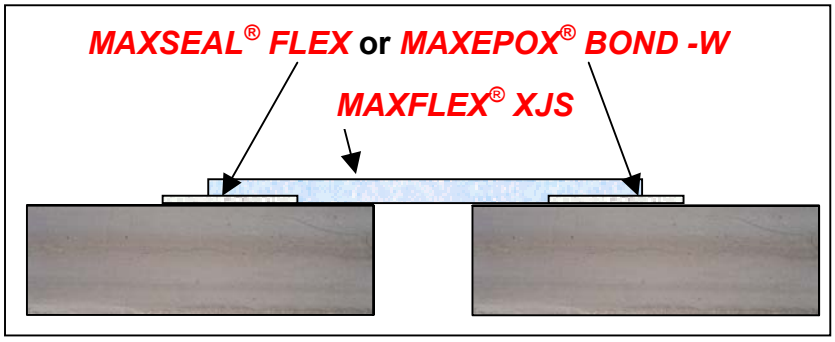


Figure 8.- Elastic sealing system for big expansion joints

2.2.2. Sealing of pipe penetrations

Pipe penetrations are outstanding points in the waterproofing job for wastewater treatment plants. For an existing wall where a new pipe needs to be placed, an oversized cut out must be created around the pipe and then apply without a break to the place to be sealed a water-swelling sealant such as ***Leakmaster*** (See Figure 9). Application thickness depends on the pipe size, that is of 5 mm for a 100 mm size. Area should be filled with ***MAXPLUG®*** or ***MAXREST®*** and a cove around the pipe must be done. Also an elastic cement-based mortar such as ***MAXJOINT® ELASTIC*** can be used.

A waterproofing finish is achieved when a ***MAXSEAL® FLEX*** flexible cement-based waterproof and protective coating, reinforced with a 58 g/m^2 glass-fibre mesh strip (***DRIZORO 58***), is placed around the pipe-wall joint.

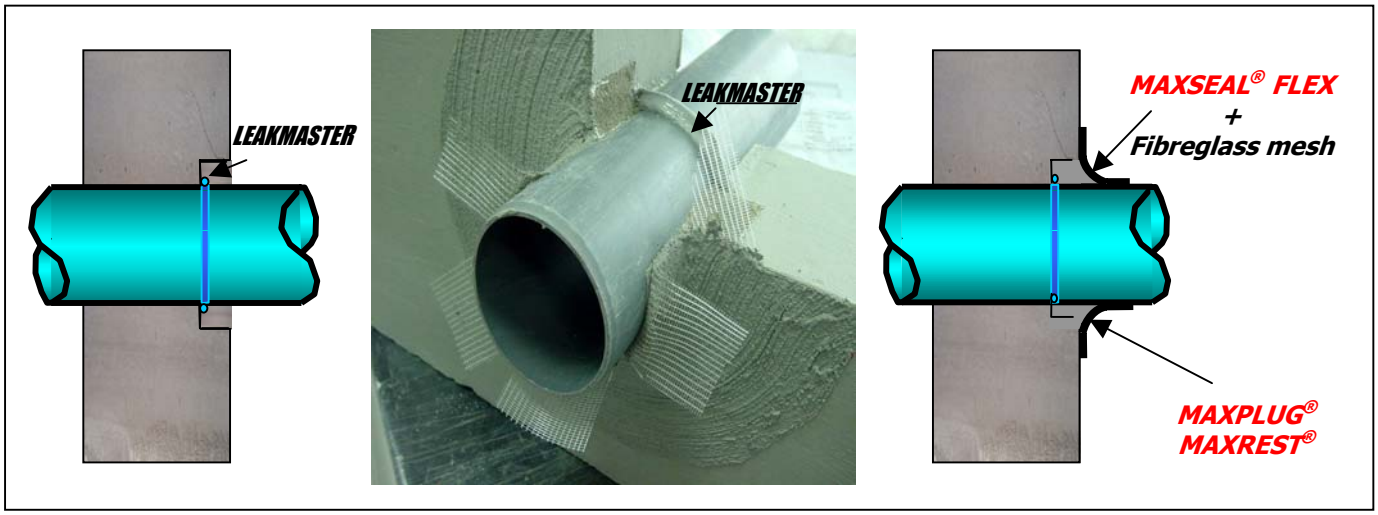


Figure 9.- Sealing of pipe penetrations

2.2.3. Treatment for openings on concrete surfaces

The wall-from technique is the most suitable to give the necessary shape, support, and finish to a concrete wall for hydrotechnical structures. An optimum finish is obtained and then, a waterproof coating can be applied without problems. The above-mentioned technique uses many small openings in order to assemble the forms. These openings should be treated appropriately in both side of the wall, but a special attention should be paid to the internal openings due to these are going to be in direct contact with the water.

Figure 10. Treatment for opening on concrete surface.

After cleaning of the area by mechanical means and removal of any PVC element, fill these clean points with a non-shrink, thixotropic, fast or normal-setting, structural repair mortar such as ***MAXREST***® or ***MAXRITE***® and finally level the repaired area. Once the repair mortar has settled, waterproof the repaired area with two layers of ***MAXSEAL***® ***FLEX***. A first layer, reinforced with a glass fiber mesh strip (***DRIZORO 58***), is recommended (See Figure 10).

2.3. Waterproofing systems

Once the above-mentioned steps have been done, that is cleaning and repair of the surface, treatment for expansion/cold joints and pipe penetrations, waterproofing of the area should be carried out according to the most suitable procedure. According to theirs uses, waterproofing and protective systems for concrete hydrotechnical structures are classified as following:

- Surface in direct contact with water.
- Surfaces in direct contact with the ground.

2.3.1. Surfaces in direct contact with water

On the one hand, if concrete is subjected to direct contact with water, surface is endangered by water penetration (particularly water containing harmful chemicals such as wastewaters), biological aggression, frost damages. On the other hand, the hazards to reinforcement steel are the free ions of dissolved salts. Thus, the aim is preparation of a waterproof and protective coating over the concrete surface to avoid the damaging action of the above named factors.

2.3.1.1. Cement-based products.

To produce a waterproof coating, ***MAXSEAL***®, ***MASEAL***® ***FLEX***, or both materials can be used. The choice depends on the substrate specifications and the final use for the concrete structure. So, if the substrate has micro-cracks or small movements or vibrations are expected, a ***MAXSEAL***® ***FLEX*** flexible cement-based waterproof coating is recommended. Also, this product must be used for wall-slab joints.

Joints (Concave corners). On the other hand, in areas where movements are expected such as slab-wall joints (concave corners), apply a first layer of ***MAXSEAL® FLEX*** reinforced with a ***DRIZORO 58*** (58 g/m^2) glass fibre mesh and then apply the second layer (see Figure 11).

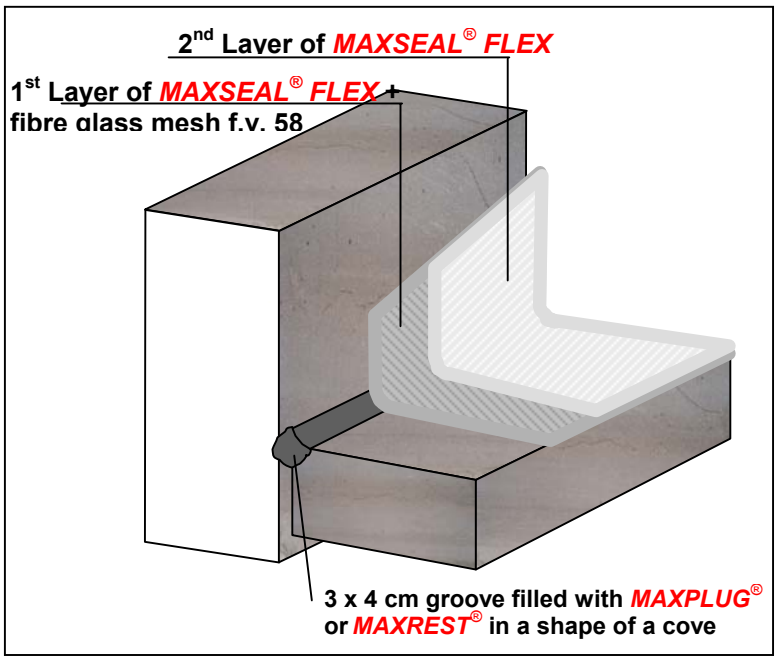


Figure 11.- Waterproofing of concave corners

Concrete walls and slabs. Once slab-wall joints have been waterproofed properly, a waterproof coating must be applied on the rest of the surfaces. For this waterproofing job, two layers of ***MAXSEAL®*** should be applied only on sound areas. In those areas or places where movements are expected it is advisable to use ***MAXSEAL® FLEX***, in order to cover cracks and to produce an anti-fracture membrane.

Prior to application of waterproofing material, the whole surface must be thoroughly washed down, but do not leave freestanding water (See Figure 12).

Figure 12.- Washing down the surface to be coated with ***MAXSEAL® -/FLEX***

A total coverage of ***MAXSEAL®*** or ***MAXSEAL® FLEX*** for concrete surface is from 2,5 kg/m^2 to 3,0 kg/m^2. In order to get a right application, the fist layer of coating should have a thickness about 1 mm and then, a second layer can be applied after material has cured. Waiting time between the applications of layers depends on temperature and application conditions.

For applications at hot temperatures and windy conditions, surfaces must be wet with water and also ***MAXCRYL®*** (3:1 by weigh) as mixing liquid must be used with ***MAXSEAL®***.

A total coverage of ***MAXSEAL®*** or ***MAXSEAL® FLEX*** for concrete surface is from 2,5 kg/m^2 to 3,0 kg/m^2. In order to get a right application, the fist layer of coating should have a thickness about 1 mm and then, a second layer can be applied after material has cured. Waiting time between the applications of layers depends on temperature and application conditions (See Figures 13 and 14).

Figure 13.- Application of ***MAXSEAL® -/FLEX*** in aeration tanks.

Figure 14.- Application of ***MAXSEAL® -/FLEX*** in primary/secondary clarifiers.

Internal surface for concrete/metal top in the anaerobic digesters. Although the concrete top for the anaerobic digesters is not subjected to hydrostatic pressure, water condensation on its internal surface (that is non-exposed area to weathering) provides a suitable environment wherein a degradation process for the concrete can taken place.

The application of two layers of ***MAXSEAL® FLEX*** waterproof coating is a suitable procedure in order to waterproof and protect the above-mentioned internal surface that is not subjected to hydrostatic pressure (See Figure 15).

Figure 15.- Internal surface for anaerobic digester coated with ***MAXSEAL® FLEX***

2.3.1.2.- Epoxy-based products

An alternative to cement-based systems is a flexible epoxy-based waterproof and protective system such as ***MAXEPOX® FLEX***. This is a two-component, solvent-free, flexible and waterproofing epoxy-based formulation suitable for use on concrete and metal surfaces. Also this coating has a very high abrasion and wear resistance and it is suitable for protection against chemicals present in the wastewaters.

MAXEPOX® FLEX is applied using a brush or roller in two successive layers with a minimum time lapse of 3 hours and maximum 24 hours between applications. To achieve a recommended total thickness of 350-400 microns, it requires an approximate consumption from 0,6 to 0,7 kg/m^2, applied in two layers (See Figure 16).

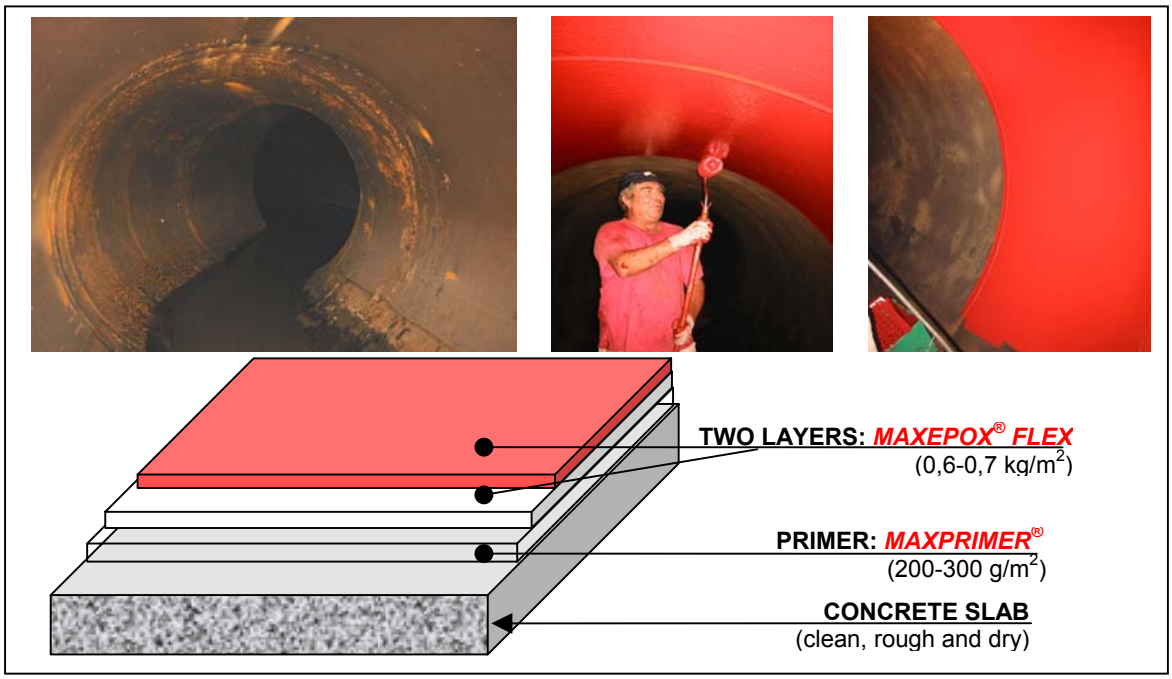


Figure 16.- Waterproofing and protection of metal or concrete surfaces with ***MAXEPOX® FLEX***

2.3.1.3.- Polyurethane-based products

Other alternative to cement-based systems is a flexible polyurethane-based waterproof and protective system such as ***MAXELASTIC® PUR***. This is a one-component, flexible and waterproofing polyurethane-based formulation suitable for use on concrete and metal surfaces. Also this coating has a very high chemical resistance so it is a suitable for protection against chemicals present in the wastewaters.

MAXELASTIC® PUR is applied using a brush or roller in two layers with a time lapse of 10-12 hours between applications. To achieve a recommended total thickness of 1 mm, it requires an approximate consumption from 0,5 to 0,6 kg/m^2 per layers (See Figure 17).

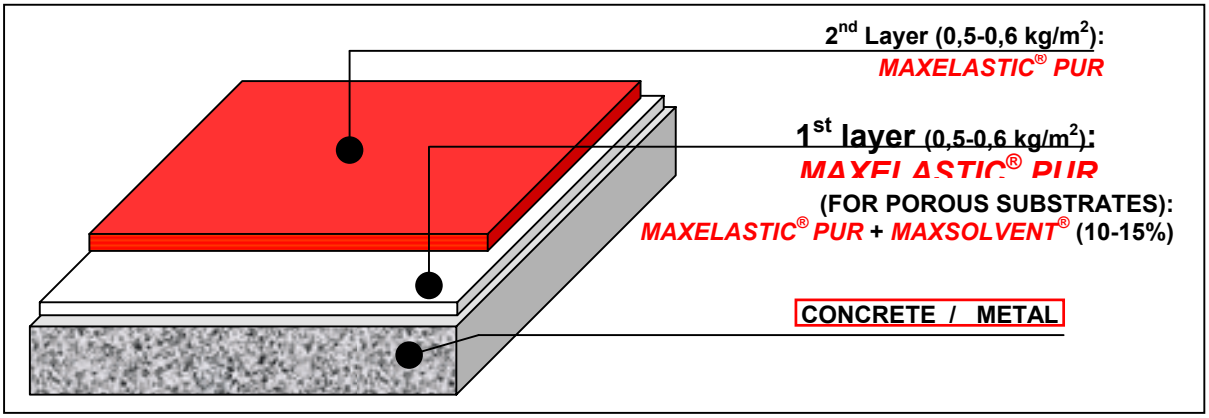


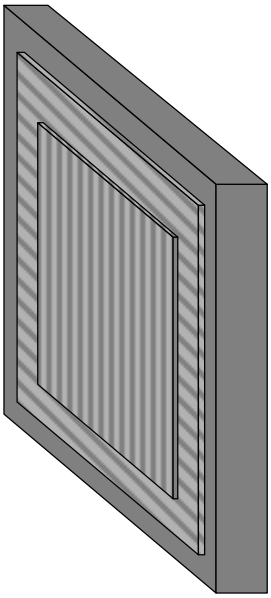
Figure 17.- Waterproofing and protection of metal or concrete surfaces with ***MAXELASTIC® PUR***

2.3.2. Surfaces in direct contact with the ground

Hazard to the structure is caused by penetration of water containing aggressive chemicals into concrete and masonry so in the case of surface in contact with ground water, it is important than chemicals dissolved do not attack to concrete. On the other hand, the weathering exposed surfaces, that is areas wherein water evaporation takes place, salts are deposited –efflorescences-. During crystallisation, salts increase their volume and burst concrete or mortar. For this application, the waterproofing and protective coating must provide a high level of watertightness and high resistance to aggressive waters.

2.3.2.1. Cement-based products

MAXSEAL® FOUNDATION is a cement-based product, which provides a great protection to concrete foundations due to its high resistance to aggressive waters. Also it can be used as waterproofing layer against humidity by capillarity. This product is applied by brush in two layers with a time lapse of 8 hours between applications (See Figure 18). For concrete and masonry foundation walls subjected to great hydrostatic pressures and water aggressiveness the second layer is a mortar consisted on ***MAXSEAL® FOUNDATION***, water and siliceous sand.



1. Surface solid, free of dust, rough and damp.
2. A first layer with 1,5 kg/m^2.
3. After 8 hours, 2nd layer of 1,0 kg/m^2.

For great hydrostatic pressures and high water aggressiveness:

2. A first layer with 1,5 kg/m^2.
3. After 8 hours, thick layer of mortar with 7,0 kg/m^2:
   MAXSEAL® FOUNDATION:Sand = 25:12

Figure 18.- Waterproofing and protection of foundations ***MAXSEAL® FOUNDATION***

MAXSEAL® SUPER is an osmotic cement-based waterproof product, which crystallises inside sealing, waterproofing and protecting the concrete structure. It has been designed to be applied on fresh or set concrete, pre-cast concrete, concrete blocks or cement plasters but is also suitable for applications in bricks and masonry. It is a suitable product for the waterproofing by dusting of concrete slabs or by coating of retaining walls, foundations slabs and below grade concrete structures.

For standard applications, ***MAXSEAL® SUPER*** can be applied by brush, broom or spray methods. Product is applied in two layers with a consumption between 1,5 and 1 kg/m^2 per layer coat, for a total consumption of about 2,5 kg/m^2 . (See Figure 19).

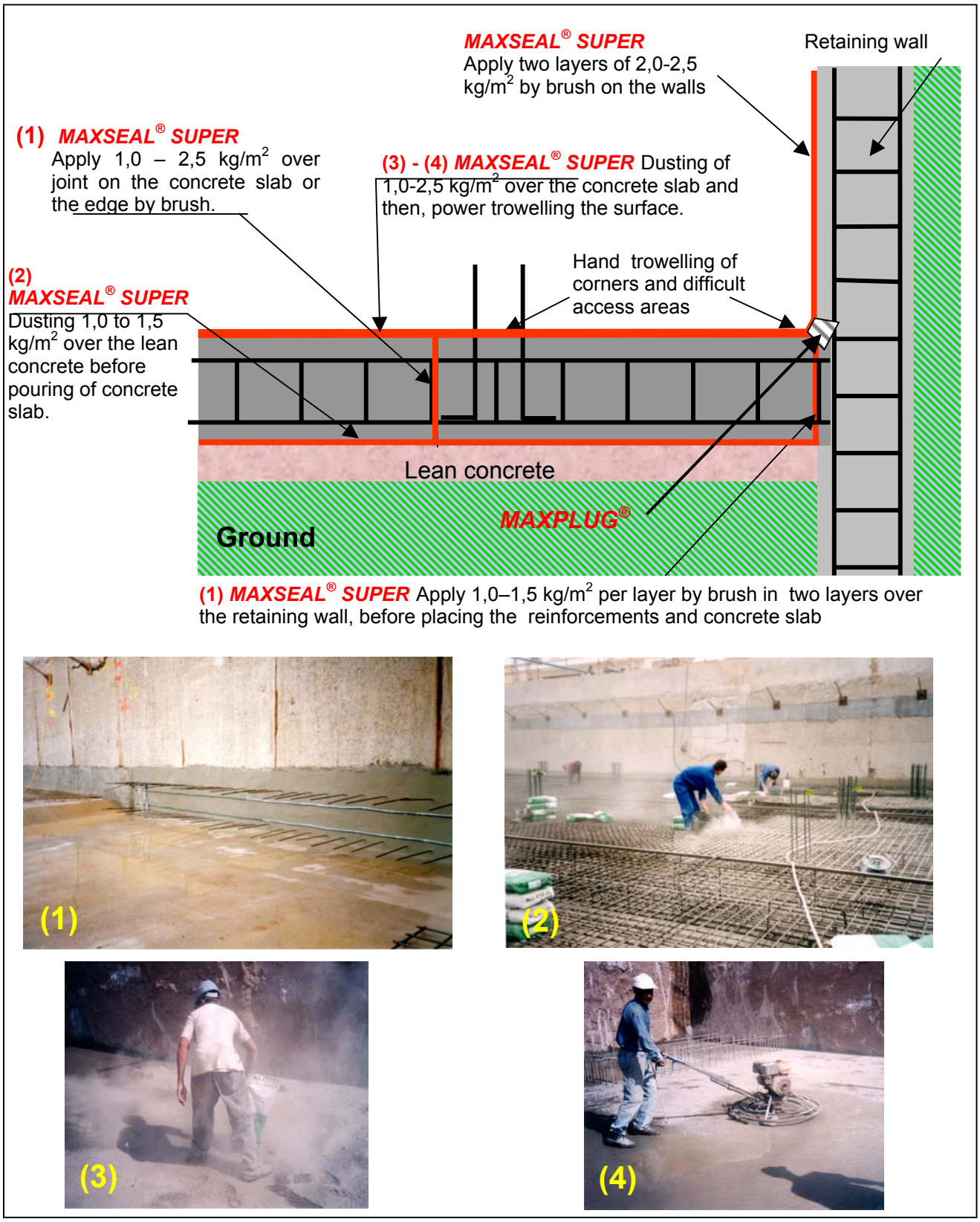


Figure 19.- Waterproofing and protection of foundations with ***MAXSEAL® SUPER***

For the dusting procedure, the application is performed on fresh concrete, after levelling, and has enough strength to be walked over, but still fresh enough to dampen the surface when trowelled. The product is spread in powder form at a ratio of 1,5 to 2,5 kg/m^2. Immediately after the surface is hosed down to prevent the superficial drying of the slab and to make the power trowelling smoother. ***MAXSEAL® SUPER*** can also be dusted on the lean concrete with a consumption of 1,5 to 2,5 kg/m^2 and then the concrete for the foundation slab can be poured after one hour, once osmotic mortar has hardened and adhered to the lean concrete.

2.3.2.2. Epoxy and Tar-based products

Other alternative to cement-based systems is a epoxy and tar based waterproof and protective coating such as ***MAXEPOX® TAR***. This is suitable product for the waterproofing against positive hydrostatic pressure and also for the chemical protection of below grade concrete structures and metal surfaces in wastewater treatment plant or aggressive environments. ***MAXEPOX® TAR*** is applied by brush, roller or air-less gun in two successive layers with a minimum time lapse of 6 hours between applications with a total consumption of 0,4-0,8 kg/m^2.

2.4 Protective Systems

Top coatings often are designed taking into account mechanical, chemical and/or thermal exposures, useful and aesthetic values, so the final coatings play an important role in estimating the surface quality. ***DRIZORO*** offers several materials, which meet requirements of the clients on desired field and also are suitable as top layer, that is, coatings exposed to chemicals and abrasion.

- Abrasion protection (Cement-based product): ***CONCRESEAL® PLASTERING***
- Chemical protection (Polyurethane-based products): ***MAXURETHANE® 2C***.

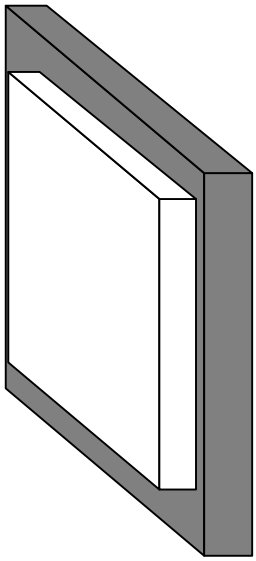
2.4.1. Abrasion protection

CONCRESEAL® PLASTERING is waterproof coating with decorative texture for protection of concrete in one single layer with thickness between 3 and 5 mm. Also, it is a suitable product to protect concrete against water flow, such as water treatment plants, dams, channels and tunnel linings. For standard applications, ***CONCRESEAL® PLASTERING*** can be applied by trowel or spay methods. Product is applied in one layer with a consumption of 1,7 kg/m^2 per mm thickness. (See Figure 20).

2.4.2. Chemical protection

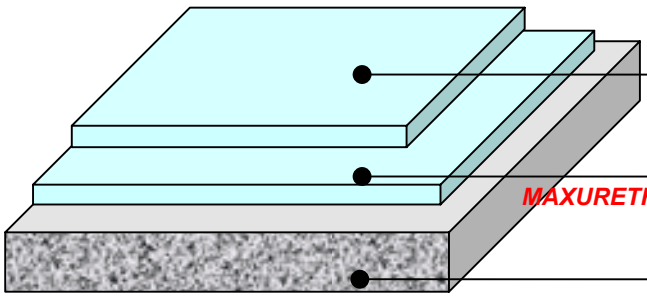
Wastewater consists of chemicals, which can damage the concrete structures. Surface leaks occur in spite of a waterproofing coating. It is typical for wastewater treatment plants, water treatment plants, swimming pools, etc. Damage is a result of application of quickly ageing materials.

MAXURETHANE®2C is a two components, high weathering resistant, elastic, coloured aliphatic polyurethane-based, protective coating for interior and exterior (UV resistant) applications. Available in clear and different colours. It is a suitable product for the finishing and chemical protection of exterior or interior horizontal concrete floors and slabs against aggressive environments (See Figure 21).



1. Surface solid, free of dust, rough and damp.
2. One layer of 3-5 mm thick with of 1,0 kg/m^2.
   a. Trowel/Spray method application.
3. After 20-30 min, a final smooth finishing

Figure 20.- Protection of concrete subjected to abrasion by water flow and mechanical elements with ***CONCRESEAL® PLASTERING*** in processing units of wastewater treatment plants



1. Surface must be solid, free of dust and dry.
2. Apply a first layer consisted of ***MAXURETHANE® 2C:MAXURETHANE® 2C SOLVENT®*** with a ratio of 8,5-9:1,5-1 (10-15 % by weight) with a coverage of 0,08-0,1 l/m^2.
3. Apply the second layer of clear ***MAXURETHANE® 2C*** (clear or coloured version) by brush, roller, air-less gun with a coverage of 0,1 kg/m^2 (0,072 l/m^2).

Figure 21.- Protection of concrete surfaces or waterproof coating subjected to chemical attack with ***MAXURETHANE® 2C***

2.5 Flooring Systems

DRIZORO offers several materials, which meet requirements of the clients for use at wastewater treatment plants.

- Increasing of floor thickness.
- Wearing and final coatings.

2.5.1 Increasing of floor thickness

To increase the floor thickness or to carry out a compression layer (base) prior to the placing of a top layer, ***DRIZORO*** provides the following products:

- ***MAXLEVEL®***. One component, synthetic resin-modified cement-based, self-levelling mortar for interior and horizontal mortar and concrete surfaces.

- ***MAXRITE® -S***. One component, non-shrink, thixotropic, repair mortar suitable for large surfaces by trowelling or spraying methods.

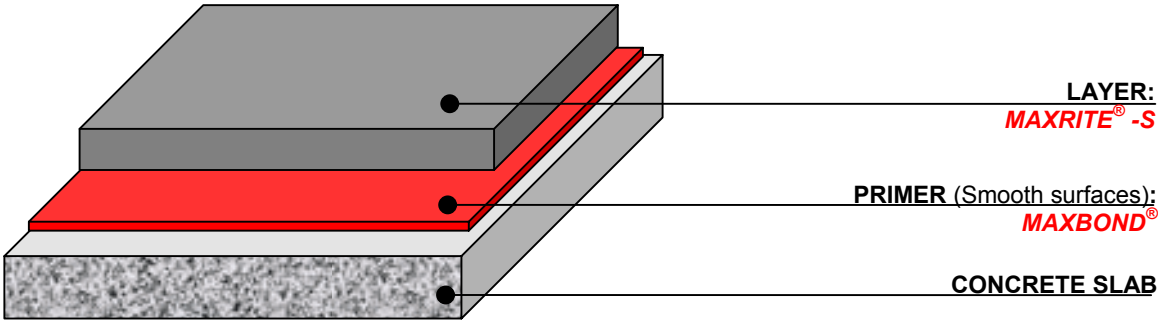
- ***MAXMORTER® FLOOR***. Quick setting and drying, polymer-modified hydraulic binder.

- ***MAXEPOX® MORTER***. Epoxy-resin binder for flooring.

NAME OF THE PRODUCT	APPLICATION FIELDS
MAXLEVEL®	Levelling and resurfacing of concrete surfaces and floors for interior applications. Carrying out of bases with thickness from 4 to 5 mm , before placing of carpets, tiles, parquet and other floor surfacing systems in housings, office buildings, etc. Suitable for floor heating systems.
MAXRITE®-S	Repair of concrete surfaces by shotcrete application or trowelling. Overlaying of floors or slabs with thickness from 5 to 50 mm before placing of any final finish.
MAXMORTER® FLOOR	Thickness increasing and repair of concrete surfaces and floors for interior applications. Carrying out of base with thickness up to 40 mm before placing of any final finish: carpet, tiles, vinyl coating and other floor surfacing systems in housing, office building, warehouses. Restoration of floors in garages, parking, premises, etc.
MAXEPOX® MORTER	Protection of industrial floors subjected to wear, impacts and chemical attacks. Industrial floors with thickness from 4 to 5 mm and anti-slip coatings. Repair of concrete structures and joints for floor subjected to high mechanical strengths.

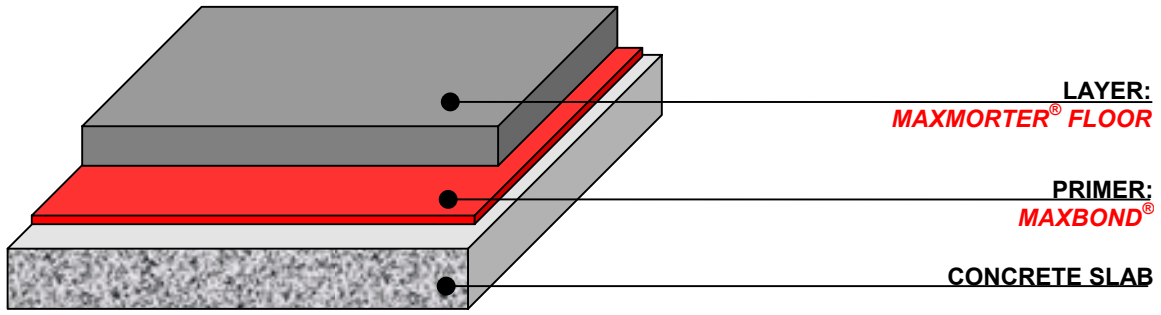
MAXRITE® -S**.** It is a one-component, non-shrink, thixotropic, long setting, polymer modified, fibre reinforced, and structural repair mortar for large areas by shotcrete means or manual applications. It is a suitable product to increase the floor thickness, repair damages or carry out any interior-flooring base, which is from 5 to 50 mm thick (See Figure 22).

MAXMORTER® FLOOR is a quick-setting and drying, polymer-modified cement-based binder, which once mixed with properly selected aggregates is a suitable product in order to increase the floor thickness, repair damages or carry out a interior flooring base which is up to 40 mm thick per layer. This base allows placing any finish such as ceramic tiles and other finishing materials after 24 h and 48 h (See Figure 23).



1. Surface must be solid, free of dust, rough and damp.
2. For smooth surfaces, ***MAXBOND®*** primer can be applied by roller with coverage of 0,125-0,2 l/m^2.
3. Placing the mortar by trowel or spraying methods (from 5 to 50 mm thick per layer) with coverage of 2,0-2,2 kg/m^2 and mm thick.
4. Second and successive layers
   a) Base should be with rough finish.
   b) After 8-24 h, placing a new layer with a recommended coverage of 2,0-2,2 kg/m^2 and mm thick.

Figure 22.- Flooring system based on ***MAXRITE®-S***

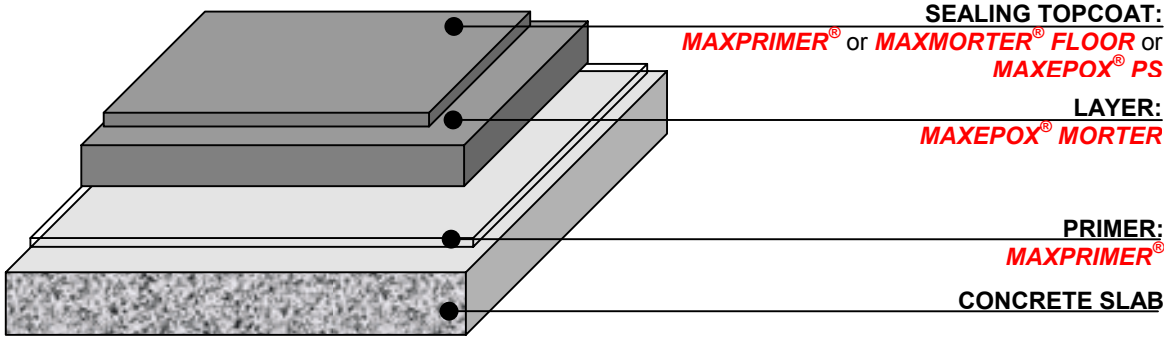


2. Surface must be solid, free of dust, rough and damp.
3. Optionally, ***MAXBOND®*** primer can be applied by roller with coverage of 0,125-0,2 l/m^2.
4. Placing the mortar by trowel (up to 40 mm thick per layer) with coverage of about 2 kg/m^2 and mm thick.
5. Second and successive layers:
   a) Base should be with rough finish.
   b) Between the next 8-24 h, placing a new layer with a recommended coverage of about 2 kg/m^2 and mm thick.

Figure 23.- Flooring system based on ***MAXMORTER® FLOOR***

MAXEPOX® MORTER is a pigmented, epoxy resin-based binder for floor mortars. It is a suitable product for protection of industrial floors subjected to wear, impacts and chemical attacks. Carrying out of industrial floors with thickness from 4 to 5 mm and anti-slip coatings. Repair of concrete structures and joints in floors subjected to high mechanical strengths (See Figure 24).

Thickness increase for floors (up to 4-5 mm thick)



1. Surface must be solid, free of dust and dry.
2. Apply an epoxy-based primer, ***MAXPRIMER®,*** with coverage of 0,2-0,3 kg/m^2.
3. After 30 min, ***MAXEPOX® MORTER*** epoxy mortar by trowel with a coverage of 2,1 kg/m^2·mm of mortar.
4. Protective coating (***MAXEPOX® MORTER*** epoxy-compounds, ***MAXEPOX® PS*** or ***MAXPRIMER®***) by roller with coverage of 0,1-0,2 kg/m^2 per layer.

Figure 24.- Flooring system based on ***MAXEPOX® MORTER***

2.5.2 Wearing and final coatings

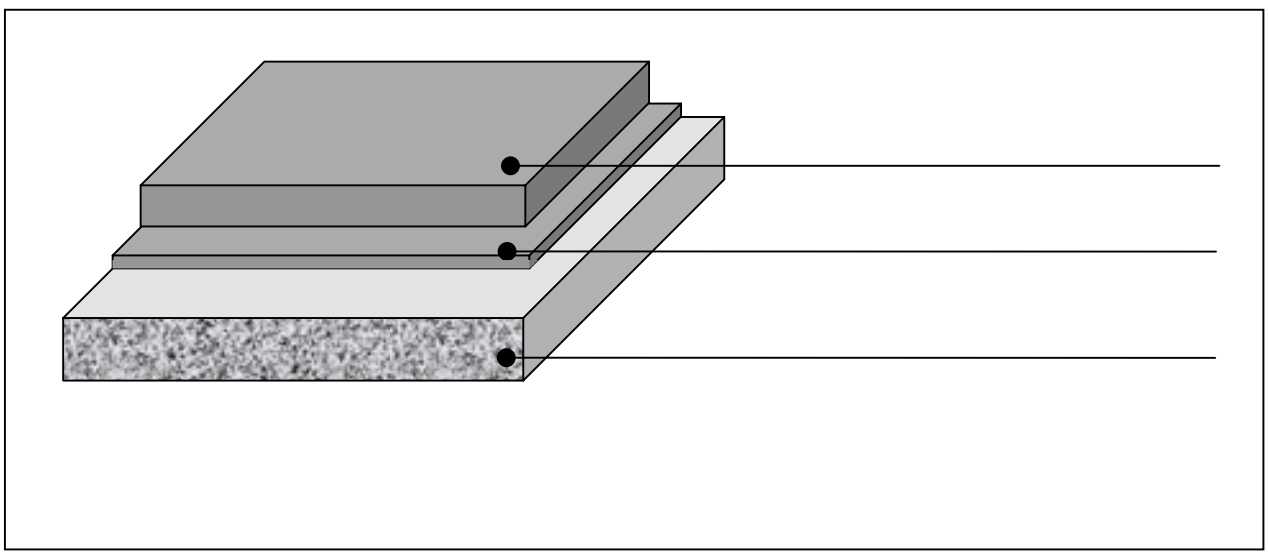
Floors often are designed taking into account mechanical, chemical and/or thermal exposures, useful and aesthetic values, so the final coatings play an important role in estimating the floor quality. ***DRIZORO*** offers several materials, which meet requirements of the clients on desired field and also are suitable as top layer, that is, coatings exposed to the abrasion.

- Self-levelling mortars
- Decorative and/or protective floor coatings:

2.5.2.1 Self-levelling mortars

Interior applications:

- ***MAXLEVEL® SUPER***. One component, fast-setting, synthetic resin-modified cement-based, self-levelling mortar for interior concrete surfaces and mortars
- ***MAXFLOOR® CEM***. Three component, cement and epoxy resin-based, self-levelling mortar for concrete surfaces and floors.



2.5.2.2 Decorative and/or protective coatings for flooring systems

Interior applications:

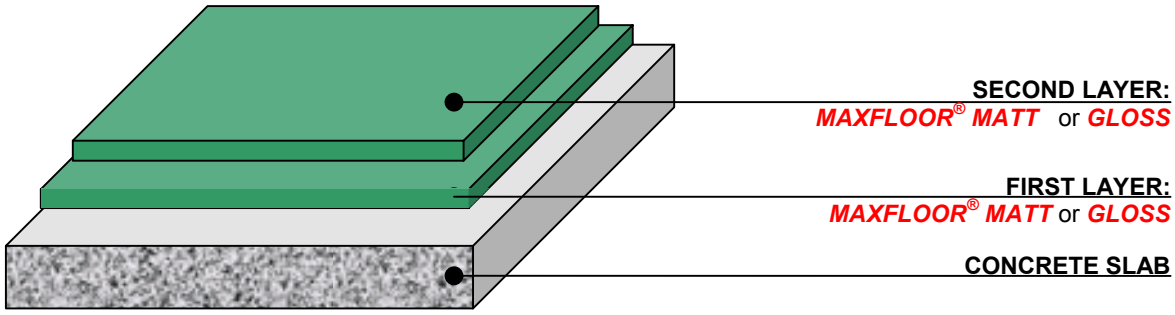
- Polyurethane-based product: ***MAXURETHANE®-/DECOR***. One-component, clear, solvent-based polyurethane, protective concrete surface coating for interior application.
- Epoxy resin-based products:
  - ***MAXFLOOR®***. A water-based epoxy, protective and decorative coating for horizontal surfaces.
  - ***MAXEPOX® MORTER*** (See epigraph 2.4.2),
  - ***MAXEPOX® -PS.*** Thixotropic, free-solvent epoxy-based, sealer and top coating for epoxy-based mortars.
  - ***MAXEPOX® FLEX*** (See epigraph 2.3.1.2).

Interior and exterior applications:

- Polyurethane-based products:
  - ***MAXURETHANE® TOP.*** One-component, high weathering resistant, elastic aliphatic polyurethane-based, protective coating for interior and exterior applications.
  - ***MAXURETHANE® 2C*** (See epigraph 2.4.2.)

MAXFLOOR® is a water-based epoxy, protective and decorative coating for horizontal surfaces and available in matt/glossy and coloured versions. It is a suitable product for decorative and anti-dust finishing of concrete floors and slabs and protection of horizontal concrete floors against chemical attacks. It can be used for protection of steel and metal surfaces and also as a primer for solvent-free epoxy systems (See Figure 26)

Coloured and smooth surface finish (Interior applications):



1. Surface must be solid and free of dust (slight residual humidity surfaces can be accepted).
2. Apply two layers of ***MAXFLOOR®*** by brush, roller or air-less gun with coverage of 0,2-0,3 kg/m^2 per layer. Before applying the second layer, observe a time of 6-12 hours.

Figure 26.- Protective and decorative coating based on ***MAXFLOOR®***.

2.6 Anchoring

A wastewater treatment plant has many metal elements that are anchored on both walls and slab. These provide many outstanding points that will produce fails in the waterproofness of the concrete structure if they are not treated suitability. Taking into account the surface wherein the anchor is placed, these are classified in vertical or horizontal anchors.

2.6.1 Anchoring of horizontal elements

According to the size of the element to be anchored, a specific mortar should be used. Thus, a small element, that is from 10 mm to 16 mm size, are anchored with ***MAXGRIP***® quick-setting, non-shrink, cement-based anchoring mortar (See Figure 27). For anchoring of bigger elements, ***MAXGROUT*** ® non-shrink, high strength grout is recommended (See Figure 27). If rebars or threaded rods need to be anchored, resin-based injection systems such as ***MAXFIX***® ***–V*** or ***MAXFIX***® ***-E*** are recommended.

Figure 27.- Anchoring on horizontal surfaces with ***MAXGRIP***® and ***MAXGROUT***®

2.6.2. Anchoring of vertical elements

To anchor on vertical surfaces any element, that is steps, probes, etc., a fast setting, non-shrink, thixotropic and fixing mortar such as ***MAXBETON***® can be used. Also resin-based injection systems such as ***MAXFIX***® ***–V*** or ***MAXFIX***® ***-E*** are suitable products for anchoring of rebars and/or threaded rods (See Figure 28).

Figure 28.- Anchoring of reinforcing bars on slabs or concrete with ***MAXFIX***®***-E*** epoxy resin-based injection system

3. REPAIR AND MAINTENANCE OF WASTEWATER TREATMENT PLANTS

In older structures, in which the existing damages cause the weakening of the metal/concrete structure, repair and protection are necessary systems. The most suitable system in order to repair is decided by technical aspects arising from diagnosis of a structure, i.e.:

- area and type of damages
- causes of damages
- location of the structural element (loads and work characteristics)
- use of the structural element

Once the repair has been completed, understood as restoration of a concrete layer up to 10 cm deep, a protective coating should be applied to avoid new damages.

3.1. Patching and repair of the damages on concrete surface

Once the surface to be waterproofed has been cleaned, many damage zone, such as cavities, voids, honeycombs, peelings, cracks, fissures and non-structural steel (rods sticking out of concrete) can be exposed so it must be patched and repaired with any specific mortar. Repair work of concrete is based upon the following specific materials

- an anti-corrosion protection of reinforcement steel, and
- a repair mortar and a waterproof coating.

Concrete around all non-structural reinforcement steel elements must be removed and non-structural elements must be cut to a minimum depth of about 2 cm and then, the steel is coated with:

- ***MAXREST® PASSIVE***, a oxide converter and protector to passive the corroded metal surfaces (See Figure 29).

- ***MAXRITE ® PASSIVE***, a one-component cement-based corrosion primer with corrosion inhibitor for steel reinforcement in concrete.

Figure 29.- Passivation of reinforcements with ***MAXREST® PASSIVE***,

To repair specific damages in concrete structures, ***DRIZORO*** provides different products, which have a specific application (See Figure 30).

NAME OF THE PRODUCT	APPLICATION FIELDS				
	Setting time (min)	Application Thickness (mm)	Polymers	Corrosion Inhibitors	Fibers
MAXREST®	20-25	< 30	NO	NO	NO
MAXRITE® -500	10-25	5-50	YES	YES	YES
MAXRITE® -S	3-7 hours	5-50	YES	NO	YES
MAXRITE® 700	75-120	5-50	YES	YES	YES

- ***MAXREST®*** is a non-shrink, thixotropic, quick setting, structural repair mortar. It is suitable product for repair and restoration of concrete structures, façades, cracks, fissures and honeycombs. Also it can be used for restoration of damages lines and shapes of concrete elements.

- ***MAXRITE® 500*** is a non-shrink, thixotropic, fast-setting, polymer-modified, fiber-reinforced, structural repair mortar with corrosion inhibitors. It is suitable product for repair and restoration of damaged concrete structures by chemical attack, weathering, aggressive environments.

- ***MAXRITE® -S*** is a one-component, non-shrink, thixotropic, long-setting, polymer-modified, fiber-reinforced, structural repair mortar for large areas by wet or dry shotcrete methods or manual applications. It is suitable product for repair of concrete structures in wastewater treatment plants and concrete pipes, overlaying of floors or concrete slabs before the final coating.

- ***MAXRITE® 700*** is a non-shrink, thixotropic, normal-setting, polymer-modified, fiber-reinforced, structural repair mortar with corrosion inhibitors. It is suitable product for repair and restoration of damaged concrete structures by chemical attack, weathering, aggressive environments.

Also it is available a smooth textured, levelling and cosmetic repair mortar for architectural concrete surfaces with thickness up to 3 mm (***CONCRESEAL® -3***) or up to 5 mm (***CONCRESEAL® -5***). These mortars can be used to level concrete elements or fill small cracks, honeycombs, gravel pockets.

Once the repair is finished it can be protected with a cement-based coating such as ***MAXSEAL®*** or ***MAXSEAL® FLEX***, or with an water-based acrylic, waterproof, protective and decorative coating for exterior and interior applications such as ***MAXSHEEN®***, which is available in two version (smoothed and textured) and wide range of colours.

1. Remove the damage and loose concrete. Expose all corroded reinforcement and eliminate rust by wire brush and finally, passivate it with **MAXREST® PASSIVE** or ***MAXRITE® PASSIVE***.
2. Prior to application repair mortar dampen the substrate.
3. Apply a bonding slurry by brush. This slurry consists of 5 parts of powder and 1 part of water.
4. While the slurry is still fresh, apply the repair mortar:
   a. ***MAXREST®***. Up to 3 cm thick
   b. ***MAXRITE® 500, 700, -S***. Up to 3 cm thick
5. Scratch the surface with the trowel to improve the adherence for the next mortar layer.
6. Level the repaired area.
7. Finish the application as desired before the final hardening takes places.

Figure 30.- Structural repair mortars

3.2. Repair mortars for floors

To repair specific damages in industrial floor, ***DRIZORO*** provides different products, which have a specific application. On one hand, cracks and fissured are treated with a non-shrink, quick-setting and structural repair mortars such as ***MAXREST®*** or ***MAXPLUG®***. On the other hand, ***MAXPATCH®*** and ***MAXROAD®*** are suitable cement-based mortars for restoration and patching of industrial floors or horizontal concrete surfaces.

- ***MAXPATCH®*** is a two component, cement-based, patching mortar for at least 5 mm thick applications.
- ***MAXROAD®*** is a fast setting, one-component, cement-based, fiber-reinforced, patching mortar for applications from 3 to 5 cm thick applications.
- ***MAXROAD® EXPRESS*** is a very fast setting, one-component, cement-based, fiber-reinforced, patching mortar for applications large/small applications.

NAME OF THE PRODUCT	APPLICATION FIELDS
MAXPATCH® *Floor repair* *Mortar in small thickness*	Repair and patching of holes, irregularities and voids or any other small damages in concrete floors: Industrial floors, ramps, parking, garage floors, warehouses, stairways, Restoration of accesses, ramps and entries or surfaces exposed to freeze/thaw cycles, etc.
MAXROAD® *Repair and patching mortar*	Urgent repairs of concrete floors and pavements, surfaces of motion trails in Sewage Treatment Plants. It is mainly recommended, where maximum shortening of the work time is required.
MAXROAD® EXPRESS *Fast-setting repair and patching mortar*	Urgent repairs of concrete floors and pavements, surfaces of motion trails in Sewage Treatment Plants. It is mainly recommended, where maximum shortening of the work time is required. Repair of voids up to 2 m^3.

3.2.1. Cracks and fissures

When cracks are present in the slab, it is necessary to know their type. Like this, for non-active cracks with opening greater than 2 mm (wherein propagation has already ceased) grooves should be opened with at least to 2 cm in deep (i.e. perpendicular direction to the surface) and between 1 cm to 2 cm thick and then, these grooves should be filled with ***MAXREST®*** repair mortar if they do not conduct water, or with ***MAXPLUG®*** quick-setting mortar if they do (See Figure 31).

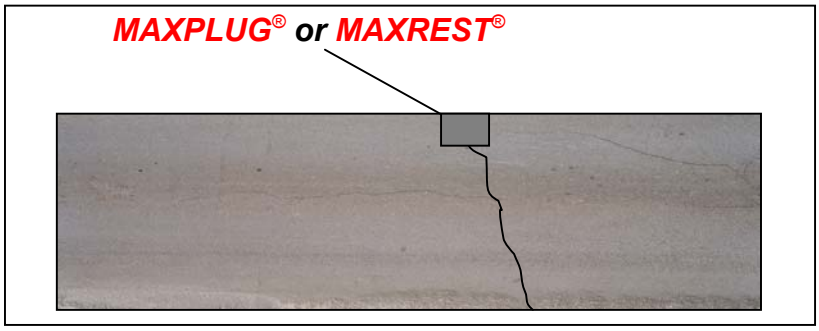
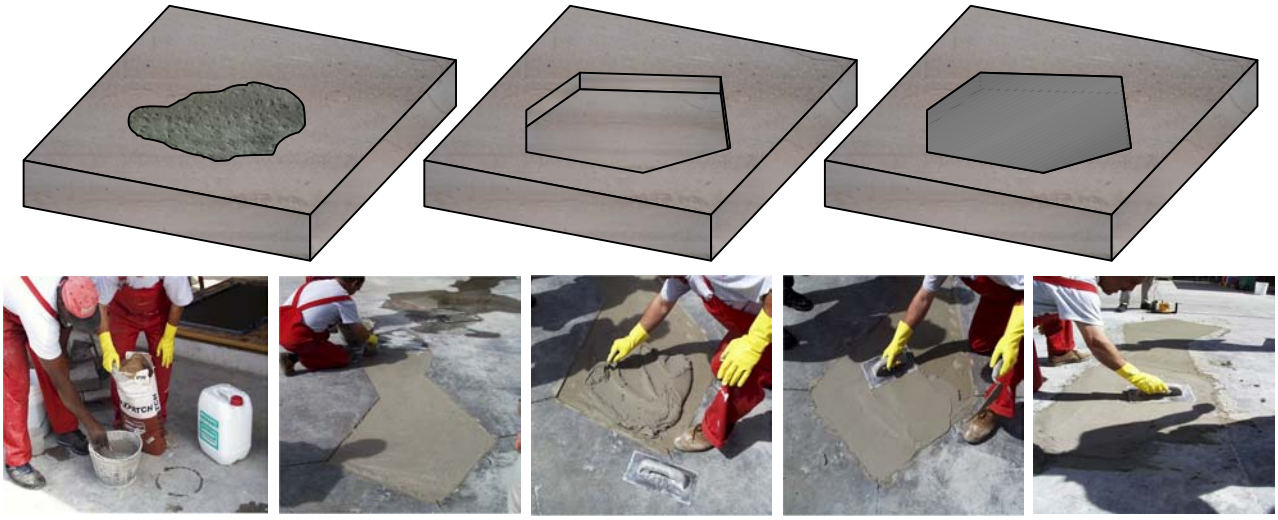


Figure 31.- Repair of non-active fissures and cracks

For active cracks or fissures, the use of polyurethane-based sealants is recommended (See epigraph 2.2.1.).

3.2.2. Voids and pot holes

Before placing any patching mortar, the area or surface to be repaired must be clean and structurally strong. To improve the adherence of the patching mortar, a primer can be recommended (See Figure 32).



MAXPATCH®

1. Surface must be solid and free of dust .So, clean to structurally and sound substrate, cut vertically 30 mm deep around the patch edges and finally dampen the surface.
2. Apply a priming slurry (5 kg powder + 1 l mixing liquid, ***MAXCRYL®*** to water ratio, 1:4) by brush.
3. Place a mortar layer up to 25 mm thick with a consumption of 2,0 kg/m^2·mm. Successive layers can be placed after 30 min.

MAXROAD®

1. Surface must be solid and free of dust .So, clean to structurally and sound substrate, cut vertically 30 mm deep around the patch edges and finally dampen the surface.
2. Apply a priming slurry (5 kg powder + 1 l mixing liquid, ***MAXCRYL®*** to water ratio, 2:1) by brush.
3. Place a mortar layer up to 30-50 mm thick with a consumption of 2,0 kg/m^2·mm.
   For applications with depth higher than 50 mm: (25 kg powder + 8 kg aggregate + 4-4,5 l water)

MAXROAD® EXPRESS

1. Surface must be solid and free of dust .So, clean to structurally and sound substrate, cut vertically 30 mm deep around the patch edges and finally dampen the surface.
2. Apply a priming slurry (5 kg powder + 1 l mixing liquid, ***MAXCRYL®*** to water ratio, 2:1) by brush.
3. Place a mortar layer up to 50 mm thick with a consumption of 2,0 kg/m^2·mm.
   For applications with depth higher than 50 mm, use the product as binder:
   - 50-100 mm deep: 25 kg + 25 kg (3-10 mm) aggregate + 4,5 l water
   - 100-300 mm deep: 25 kg + 25 kg (3-25 mm) aggregate + 4,5 l water.
   - Large volume (Up to 2 m^3): Filler up to 300 mm deep

Figure 32. Placing of ***MAXPATCH®***, ***MAXROAD®*** and ***MAXROAD® EXPRESS***

4. TECHNICAL BULLETINS FOR DRIZORO PRODUCTS

Some of the technical bulletins for the ***DRIZORO*** products, which are mentioned in the technical report, are the following:

Waterproofing systems:

- ***MAXSEAL®***. Cement base waterproof coating for positive or negative pressure. (Technical Bulletin nº 1).
- ***MAXPLUG®***. Very quick setting hydraulic mortar for stopping leaks under pressure (Technical Bulletin nº 4).

- ***MAXSEAL® FOUNDATION.*** Waterproof, cement-based coating for exterior underground concrete and masonry. (Technical Bulletin nº 8).
- ***MAXSEAL® FLEX***. Flexible two component waterproof coating against positive or negative pressure. (Technical Bulletin nº 29).
- ***MAXSEAL® SUPER.*** Cement-based, waterproof coating with crystallisation and osmotic properties. (Technical Bulletin nº 83).
- ***MAXEPOX® TAR.*** Epoxy-based, waterproof and protective coating for concrete and metal surfaces. (Technical Bulletin nº 106).
- ***MAXEPOX® FLEX.*** High performance flexible and waterproof epoxy system. (Technical Bulletin nº 165).
- ***MAXELASTIC® PUR***. One-component, elastic and waterproofing polyurethane-based formulation suitable for light traffic roofs and terraces. (Technical Bulletin nº 172)

Joint treatments:

- ***MAXFLEX® 900***. Two-component polysulphide sealant for permanent immersion and high chemical resistance. (Technical Bulletin nº 25).
- ***MAXFLEX® 100***. Single component polyurethane sealant. (Technical Bulletin nº 63).
- ***MAXFLEX® XJS***. Elastic sealing system for expansion joints. (Technical Bulletin nº 73).
- ***MAXJOINT® ELASTIC***. Elastic mortar for sealing joints and cracks subject to movement in concrete and masonry. (Technical Bulletin nº 156).

Protective and decoration systems:

- ***CONCRESEAL PLASTERING®*.** Waterproof coating with decorative texture for protection of concrete and masonry from water and marine environment. (Technical Bulletin nº 6).
- ***MAXURETHANE® 2C***. Two component, polyurethane-based decorative and protective coating with porcelanic finish. (Technical Bulletin nº 87).

Flooring systems:

- ***MAXLEVEL®***. One component, synthetic resin-modified cement-based, self-levelling mortar for interior and horizontal mortar/concrete surfaces. (Technical Bulletin nº 21).
- ***MAXFLOW® 500***. One-component, self-levelling high strength, cement-based, metal fiber-reinforced, repair and finishing, floor mortar. (Technical Bulletin nº 38).
- ***MAXEPOX® MORTER***. Epoxy-resin binder for flooring. (Technical Bulletin nº 76).
- ***MAXMORTER® FLOOR***. Quick setting and drying, polymer-modified hydraulic binder (Technical Bulletin nº 122).

- ***MAXFLOOR®***. Water-based epoxy coating for floor finishes and painting of surfaces in general. (Technical Bulletin nº 33).
- ***MAXURETHANE®*** Single-component solvent based transparent polyurethane protection, against chemical attacks and abrasion. (Technical Bulletin nº 38).

Anchoring systems:

- ***MAXGRIP®***. Quick setting, fluids anchoring mortar for concrete and masonry. (Technical Bulletin nº 11).
- ***MAXGROUT®***. Non-shrink, high resistance and fluid mortar for fillings, anchorages and structural repair. (Technical Bulletin nº 28).
- ***MAXFIX® -V***. Styrene-free vinylester resin for fastening of threaded rods and rebars in concrete and masonry. (Technical Bulletin nº 168).

- ***MAXFIX® -E***. Epoxy-based resin for fastening of threaded rods and rebars in concrete and masonry. (Technical Bulletin nº 169).

Repair systems

- ***MAXREST®*****.** Quick setting mortar, thixotropic, without shrinkage, single component for structural and sulked concrete repairs. (Technical Bulletin nº 2).
- ***MAXRITE® 500*****.** Quick setting mortar, thixotropic, without shrinkage. Single component product modified with polymers and fiber-reinforced, high resistance. (Technical Bulletin nº 50).
- ***MAXRITE® 700*****.** Single component mortar modified with polymer and fiber-reinforced, with high resistance. Normal setting. (Technical Bulletin nº 51).
- ***MAXREST PASSIVE®*****.** Neutralising and anticorrosion film for steel reinforcement. (Technical Bulletin nº 12).
- ***MAXRITE® -S****.* One component, non-shrink, thixotropic, repair mortar suitable for large surfaces by trowelling or spraying methods (Technical Bulletin n° 57).

- ***MAXPATCH®*** . Two component, cement-based, repair and patching mortar from 5 mm to 25 mm thick applications. (Technical Bulletin nº 07).
- ***MAXROAD®***. Fast setting, one-component, cement-based, fiber-reinforced, patching mortar for applications from 3 to 5 cm thick. (Technical Bulletin nº 27).
- ***MAXROAD® EXPRESS*** Very fast setting, one-component, cement-based, fiber-reinforced, patching mortar for applications large/small volume applications. (Technical Bulletin nº 125).