

**RAYSTON**

**MANUAL OF RESIN  
SYSTEMS FOR  
FLOORING**





## KRYPTON CHEMICAL IN THE WORLD

- **KRYPTON CHEMICAL ESPAÑA**  
Parent company. Manufacturing plant.

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- **KRYPTON CHEMICAL FRANCE**

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- **KRYPTON UK**

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- **KRYPTON LATINO AMÉRICA – Chile**

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- **KRYPTON BRASIL**

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- **KRYPTON CHEMICAL SEE (South East Europe) – Slovenia**

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- **WAREHOUSE IN PANAMÁ**

**Krypton Chemical** is an integrated company with a manufacturing history of over 13 years. Since 1999, we have a very clear aim/goal: to bring the latest technology in the design and use of polyurethane and epoxy resins based systems, to the construction market, both for new and refurbishment projects.

We collaborate with the biggest names in the industry for the design and development of our products. We develop innovative applications for flooring systems, which are indispensable in modern construction and are highly appreciated by all professionals.

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### Our Strengths

- Integration in a single factory of different processes from product conception to its placing in the market.
  - Design and manufacture of finished products.
  - Packaging specialties for various applications.
- Cost competitiveness and flexibility to meet the needs of the most demanding customers.
- High level of quality throughout our manufacturing process.
- Technical assistance and advisory work, supporting customers and applicators in all phases of a project.

# INDEX

## MANUAL OF RESIN SYSTEMS FOR FLOORING

RAYSTON SYSTEMS AND SOLUTIONS BY KRYPTON CHEMICAL	4-5
RAYSTON FLOORING SYSTEMS AND ACCREDITATIONS	6-10
SUBSTRATE PREPARATION: a critical point	11-16
HOW TO CHOOSE THE RIGHT RAYSTON SYSTEM TABLE SELECTOR: Systems / Applications	17
POSSIBLE APPLICATIONS TABLE SELECTOR: Applications / Systems	18 19
DESCRIPTION OF RAYSTON SYSTEMS Systems' Index	20
PAINT SYSTEMS	
Colodur / Colodur eco / Pavidur / Kryptanate M / EP Aquacoat / UV coat	21-23
* INNOVATION: Rayston UV System	24-25
Some projects utilising Paint Systems	26-27
SELF-LEVELING SYSTEMS	28-31
Pavifloor Coating Level Design	32 33
EP Aquanivel / EP Nivel	34
Kryptanate 100	35
Paviflex	36
Some projects utilising self-leveling systems	37-39

MULTILAYER SYSTEMS	40-41
EP Multilayer	42
EP Multilayer Aqua	43
Multilayer Kryptanate 100	44
Some projects utilising Multilayer Systems	45-46
DECORATIVE BINDER SYSTEMS FOR DOMESTIC, URBAN AND LANDSCAPE IMPROVEMENTS	47
Pavistone	48-52
Rubber binder	53-55
Some projects utilising Binder Systems	56-57
COMFORT SYSTEMS	
Paviflex Sport / Paviflex Sport Plus	58-60
Some projects utilising Comfort Systems	61
* INNOVATION: ANTIBACTERIAL RAYSTON SYSTEM	62-63
MAINTENANCE AND REPAIR	64
CAUSES AND REMEDIES	65
COMPLEMENTARY PRODUCTS	66-67
KRYPTON CHEMICAL TECHNICAL DEPARTMENT	68
QUALITY CONTROL AND TECHNICAL ASSISTANCE	69
TECHNICAL CONFERENCES AND TRAINING COURSES OF KRYPTON CHEMICAL	70
CONCLUSIONS	71

# RAYSTON SYSTEMS AND SOLUTIONS FROM KRYPTON CHEMICAL



Whether you are an architect, owner or builder, **KRYPTON CHEMICAL** offers you a high level of technical assistance, support and guidance in all phases of the project. Rayston systems for resin floors are recognized worldwide for their impeccable track record.

Backed by long term warranty certificates, and an extensive network of certified installers, these systems offer great security and satisfaction for the specifier, owner and end user.

## VERSATILE FLOORING SOLUTIONS

Our wide range of products are always applied in liquid form. They are based on the most advanced polymer chemistry and result in excellent performance and long term integrity.

Flooring resin systems are achieved by the confluence of the three elements for success:

- A system tailored to customer needs
- A careful and precise execution
- An absolute focus on manufacturing quality and consistency

Throughout this manual, you can acquire the knowledge for the design and execution of resin flooring systems and associated guarantees.

## A RAYSTON SYSTEM FOR EVERY NEED REFURBISHMENT

### REHABILITATION

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Our extensive product range is adaptable to almost any substrate and often avoids the need for removal of the original substrate. Our fully bonded, continuous systems provide new high performance flooring.

### NEW WORK

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A large majority of pavements are prepared by abrasion of the fresh concrete (helicopter) with materials of different hardnesses (quartz, corundum, etc.) to close the pores and impart additional properties and performance.

These products can offer a quick and inexpensive solution, but are also doomed to failure because the concrete is an extremely alkaline material which generates dust, easily stains and degrades prematurely.

If the security and integrity of the pavement is the goal, the pavement is complex, must be fully continuous and free of joints, if there is heavy traffic, future repairs will be complicated due to their intensive and continuous use.

**Rayston flooring systems offer a long term economical alternative that will add value to your project.**

# RAYSTON FLOORING SYSTEMS: Certifications and Accreditations

The Krypton Chemical Rayston flooring range of systems hold many certificates required to comply with the regulations controlling their intended uses.

The following tests have been conducted by the appropriate independent laboratories in each specific country.



# PRODUCT TESTING

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Applus + is a leading testing, inspection, certification and technological services. Company based in Barcelona

**Krypton Chemical** has several certifications and tests that are tailored to different types of applications and for different products and / or systems.



## COLODUR

single component paint/varnish (aliphatic, solvent based, high solids polyurethane)

- **Trials 2000H UV Xenotest= 10 years. No. 08/32307407**  
Tensile strength and elongation at break, artificial aging, waterproof properties water vapour permeability.
- **Performance tests / colour / aging No. 10/101.589.1432**  
(COLODUR 60 COLOURED).
  - TABER Abrasion resistance UNE 48250.
  - Scratch resistance EN ISO 1518.
  - Resistance to liquids (motor oil and diesel). UNE EN ISO 2812-3 and EN ISO 2812-4.
  - Resistance to staining from contact with vulcanized rubber.
  - Determination of brightness UNE EN ISO 2813.
  - Colorimetric determination (CIELAB coordinates) UNE 48073/2 and ISO 7724/2.
  - Determination of whiteness and yellowness index ASTM E313.
  - Accelerated artificial aging for outdoors applications.Test method EN ISO 11341:2005 "Paints and varnishes:  
Artificial aging and artificial exposure: Exposure to a filtered xenon arc lamp".
- **Slip resistance / slip No. 10/1709-1862**  
Determination of slip resistance value / anti-skid floorings (USRV).  
UNE-ENV 12633:2003

P. 07

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## PAVIDUR

single component paint / varnish (aromatic solvent based, high solids polyurethane)

- **Taber Abrasion No. 08/32309984**  
TABER Abrasion resistance UNE 48250

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## KRYPTANATE M

paint / varnish (aliphatic solvent based polyurea) for fast curing applications

- **Performance tests / colour / aging No. 10/101.589.1433.**
  - TABER Abrasion resistance UNE 48250.
  - Scratch resistance EN ISO 1518.
  - Resistance to liquids (motor oil and diesel) EN ISO 2812-3 and EN ISO 2812-4.
  - Resistance to staining from contact with Vulcanized Rubber
  - Brightness testing UNE EN ISO 2813.
  - Colour stability (CIELAB coordinates) UNE 48073/2 and ISO 7724/2
  - Whiteness / yellowing index testing ASTM E313
  - Accelerated artificial aging outdoors.Test method EN ISO 11341:2005 "Paints and varnishes:  
Artificial aging and artificial exposure: Exposure to a filtered xenon arc lamp".
- **Slip resistance / slip No. 10-1709-1863.**  
Determination of slip resistance value / anti-skid flooring (USRV).  
UNE-ENV 12633:2003, Annex A.



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**Krypton Chemical** has several certifications and tests that are tailored to different types of applications and for different products and / or systems.

## COLODUR ECO paint / varnish (polyurethane water base, 2 components)

- **Tests of resistance / colour / aging N° 10/101.589-1261**
  - Abrasion resistance TABER UNE 48250
  - Scratch resistance UNE EN ISO 1518- Resistance to fluids (engine oil and diesel) UNE EN ISO 2812-3 & UNE EN ISO 2812-4
  - Stain resistance after contact with vulcanized Rubber
  - Gloss testing UNE EN ISO 2813
  - Colorimetric determination (coordinates CIELAB) UNE 48073/2 ISO 7724/2
  - Determination of whiteness and yellowness index ASTM E313
  - Artificial accelerated aging test to weathering. Test method UNE EN ISO 11341:2005 "Paints and varnishes: Artificial aging and artificial exposure: Exposure to a filtered xenon arc lamp"
- **Slip resistance N° 10/1709-1861**  
Determination of the resistance value of slip / skid of unpolished flooring (USRV). UNE-ENV 12633:2003

## PAVIFLOOR Self-leveling high hardness solvent free

- **CE Mark N° 09/32301291 UNE-EN 13813:2003**
  - Surface hardness, UNE-EN 13892-6:2003
  - Bond Strength, UNE-EN 13892-8:2003
  - Impact resistance, UNE-EN ISO 6272-1:2004
  - Wear resistance BCA, UNE-EN 13892-4:2003
  - Determination of slip resistance UNE-ENV 12633:2003
  - Compressive strength and flexural, UNE-EN 13892-2:2003
  - Determination of flexural properties, UNE-EN ISO 178:2003
- **Abrasion resistance N° 08/32309984**  
Abrasion resistance TABER UNE 48250

## PAVIFLEX Self-leveling flexible hardness solvent free

- **CE Mark N° 09/32301292 UNE-EN 13813:2003**
  - Surface hardness, UNE-EN 13892-6:2003
  - Bond Strength, UNE-EN 13892-8:2003
  - Impact resistance, UNE-EN ISO 6272-1:2004
  - Wear resistance BCA, UNE-EN 13892-4:2003
  - Determination of slip resistance UNE-ENV 12633:2003
  - Compressive strength and flexural, UNE-EN 13892-2:2003
  - Determination of flexural properties, UNE-EN ISO 178:2003
- **Abrasión Taber N° 08/32309984**  
Abrasion resistance TABER UNE 48250

## KRYPTANATE SPRAY

Coating (urea / urethane 100% solid, applied by hot spraying)

- **Tests 2000H = 10 years on metal. N° 09/100.059.649**  
Tensile strength and elongation at break accelerated artificial aging, waterproofing, and water vapour permeability.
- **Corrosion and abrasion Taber N° 09/32301905**  
Test according to UNE EN ISO 12944-6:99: Protection steel structure against corrosion by protective paint systems.  
Abrasion TABER UNE 48250:1998
- **Slip resistance N° 10/1709-1863**  
Determination of the resistance value of slip / skid of pavements unpolished (USRV). UNE-ENV 12633:2003, Annex A.



FCBA is a french technological institute, that is made of several laboratories, all of which are involved in AENOR, CEN ISO normalisation, and national/ international inter-laboratory testing.

All FCBA labs are recognized by the french Ministry for Internal Affairs.

## PAVIFLOOR SYSTEM + COLODUR ECO + CHIPS

- **Classification of fire behaviour N° 09/RC 51NF EN ISO 9239-1 & NF EN ISO 11925-2**

This report defines the classification assigned to PAVIFLOOR + ECO COLODUR + CHIPS under testing method established in the regulations EN 13501-1: 2007.

1. NF EN ISO 9239-1  
Reaction to fire tests for floor coverings.  
Determination of behaviour to fire with a radiant heat source.
2. NF EN ISO 11925-2  
Tests of ignition.

P. 09



Valencia Institute for bio-mechanics, founded in 1976, is a technological center for the study of the behaviour of the human body, and its relationship with products, services and different environments utilised by human beings.

IBV combines knowledge coming from bio-mechanics, ergonomics or emotional engineering, and applies this knowledge to different fields. Its main goal is to apply this knowledge to improve the competitiveness of industrial sectors, through improvements in the well-being of people.

## PAVIFLEX SPORT SYSTEM

- **Surfaces for sports areas N° 100250 - PV10/0476 Normative EN 14904:2006.**

Specifications multisport indoor flooring. Indicated with\* trials that are outside the scope of accreditation of ENAC.

1. Reduction of forces (dry) according to UNE-EN 14808:2006
2. Slip resistance (dry) according to UNE-EN 13036-4:2004
3. Resistance load rolling according to UNE-EN 1569:2000\*
4. Abrasion resistance according to UNE-EN ISO 5470-1:1999\*

- **Surfaces for sports areas Normative EN 14904:2006.**

## PAVIFLEX SPORT PLUS SYSTEM

*Tests of process damping rubber Mat Plus.*



Sanitary registration of food products industries in Catalonia.  
N° RSIPAC 39.05028/CAT

# TESTING WORK IN PROCESS

## RAYSTON FLOORING SYSTEMS

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KRYPTON CHEMICAL is always innovating to create, adapt and certify its products and meet the needs of the market and its customers.

### TESTS FOR EPOXY SYSTEMS

AQUACOAT  
AQUANIVEL  
EP NIVEL  
MULTILAYER  
AQUA MULTILAYER



#### TESTS EUROCLASSES

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P. 10

- **Test 1:** UNE EN ISO 11925-2:2011  
Flammability of the product when subjected to the direct action of a flame.
- **Test 2:** UNE EN ISO 9239-1:2011  
Determination of burning behaviour by a radiant heat source.

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### TEST FOR SELF-LEVELING SYSTEMS

EP AQUANIVEL



#### CE MARK

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- Wear resistance BCA, UNE-EN 13892-4
- Impact resistance, UNE-EN ISO 6272
- Tensile resistance, UNE-EN 13892 support adhesion).
- Classification by testing reaction to fire, EN 13501-1

#### SLIP

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- Slip resistance test, UNE-ENV 12663

### PAVIFLEX SPORT PLUS

#### SYNTHETIC FLOORING INDOOR TRIALS

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- Friction UNE-EN 13036-3 y 4
- Load treads UNE-EN 1569
- Abrasion UNE-EN-ISO 5470-1
- Impacts absorption EN 14808

# SUBSTRATE PREPARATION

## A critical point

Substrate preparation is the basis for a successful application of liquid systems. A substrate's nature and qualities are essential for the adhesion and durability of all floorings executed with RAYSTON Systems.

P. 11

Consult the Krypton Chemical technical department for any additional tests or available process.

Professional installers (flooring companies) should always conduct a "check list" regarding the condition of the substrate and implement the necessary preventive treatments in each case

### GENERAL ASPECTS

Liquid flooring systems require certain minimum conditions in the substrate to which they are applied in order to obtain the maximum long term properties from them.

#### Success is achieved when:

- Specification is conducted professionally and respects the intended use
- Application is conducted by approved installers who maintain good quality standards
- Substrates have sufficient preparation and conditions for good adhesion and durability of the flooring system

#### The support should have the following characteristics:

1. Dry (both on the surface and inside)
2. Leveled
3. Cohesive
4. Even
5. Free of cracks (to be pretreated)
6. Clean, free of dust and debris and loose materials and free of oils, grease or other chemical impurities

These conditions are relatively easy to obtain in case of new floor construction, but refurbishments can demand major treatments to conform to the standards required for long term trouble free performance.



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## HUMID SUBSTRATE

The suspected presence of moisture in the support should be controlled. Testing of maximum moisture content in the floor can be with a digital hygrometer (PosiTector or similar). This establishes both the moisture content in depth (by radio-frequency) and surface (contact electrodes).

The presence of humidity in the substrate can result in blistering of polyurethane systems or the de bounding of epoxy systems. If there is a higher level of humidity than the maximum allowed for 100% solids or solvent based systems, it is better to use water based systems, which have a higher permeability and tolerance to moisture.

It is important to monitor the dew point, so that work is always conducted at least +3° C above this point, this avoids application under unsuitable atmospheric conditions. In water based systems is also important to ensure good ventilation, because the evaporation of water from the system will cause fluctuations in the relative humidity at the working area, which can affect drying of the applied material.

In cases of new construction, it is important to respect the concrete curing time before application of the flooring system it is recommended to wait a minimum of 28 days in summer and 56 in winter, except in systems that explicitly determine a different timeout.

P. 12



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**NOTE:** For a more accurate measure of the moisture of the support, it may be necessary to measure the dew point. Consult our detailed instructions and data tables for use.

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## MECHANICAL TREATMENT AND CLEANING

The surface preparation is a critical aspect of all flooring applications. Suitable preparation provides maximum adhesion and cohesion of the subsequently applied system.

Prior to the application of a resin flooring systems the preparation of the concrete should always be by a dry method.

Wet cleaning imparts a very high level of moisture into the concrete. You are then obliged to wait for the complete evaporation of this moisture before starting the installation of the flooring system. This causes very long delays in the execution of work and therefore is not recommended. For this reason, the systems recommended prior to the application of resins or paints for continuous flooring systems are dry treatments including collection of the dust generated.

Flooring systems are increasing in importance and constantly evolve, both in the industrial and decorative segments; these systems are increasingly influenced by the new requirements and standards of durability, hygiene practices, and legislation.

Along with the products and systems, techniques of surface preparation have also evolved, especially with machines dedicated to these purposes.

It is important to note that each surface receiving a flooring system is different, and is further influenced to varying degrees by external factors such as weather, which can influence your substrate preparation method. For this reason, there is no universal theory for this type of work; it is therefore necessary to explain the differences between the various mechanical surface preparations and treatments.

The goal of this manual is to explain the importance and consequences of substrate preparation, in order to obtain for every project the necessary guarantees for adhesion and durability.

A list of methods available in the market (sorted by degree of abrasion and depth of treatment) is as follows:

- Sanding
- Abrasion with diamond blades
- Shot Blasting
- Scarifying

The use of a system depends on the flooring system to be applied. A greater thickness requires a more demanding preparation.



Companies that are dedicated to the application of flooring must have the right machines for good preparation and application.

Here is a list of the minimum equipment required for mid-sized works, to facilitate good anchorage of the applied system.

### Basic equipment:

- CLEANING MACHINE
- DISK SANDER
- SCARIFYING MACHINE
- DIAMOND GRINDING MACHINE
- MANUAL GRINDING MACHINE for corners, details

If this machinery is not available in house, then another option is to sub-contract the surface preparation to companies specialized in blasting / scarifying, etc.

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**NOTE:** Most common preparation systems for resin flooring are: 100% dry treatments with dust collection.

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## SANDING

The auxiliary sander is a machine for preparing the Substrate. It is a rotating plate, incorporating tungsten grit or corundum. The machine was historically used to open pores in concrete, but with the arrival of new machine technology, and the need to ensure good anchorage of the applied flooring, sanding is now increasingly being used to improve the adhesion between coatings of subsequent layers by sanding between coats, or for preparation of small areas.



## DIAMOND GRINDING

The latest innovation in the field of flooring preparation, is diamond grinding. This system cuts the surface. Using different diamond particle sizes depending on the requirements as to the finish floor, from very grating to very fine pore opening.

It is also possible to diamond grind after scarifying a floor, in order to obtain a smoother substrate, and savings in the quantity of resin required. Diamond grinding is the most widely used preparation system, totally dry and specially advised for coatings / paints for low thickness flooring systems.

One of its most important features is that it is a dry process.

P. 13



## SHOTBLASTING

The blasting operation is based on fine metal balls thrown by a turbine striking the pavement. Then the machine retrieves the balls and dust automatically which is collected by the vacuum cleaner. This is a dust free operation. Shot blasters efficiently open the pores and ensure good anchorage.

This type of surface preparation is recommended for painted floors, and very smooth pavements worn by use.



## SCARIFYING

The scarifying machine acts by a rotor striking the surface and leaving a rolling effect approximately from 0.2 mm to 5 cm. depth, depending on the machine model. You can use different mills, which can be tailored for deeper scarifying, superficial abrasion and marking, or removing existing coatings which could be extremely costly and time consuming with other methods.

Recommended for high thickness coatings and multilayers, mortars, self-leveling, etc.



## VACUUM CLEANING

The vacuum cleaner is an essential complementary machine. After any treatment it is essential to leave the work area completely free of dust, both on the ground and in suspension in the air.

There is a big variety of vacuum cleaning machines. In flooring preparation it is important that the vacuum cleaning machine can work in parallel to the substrate preparation equipment.

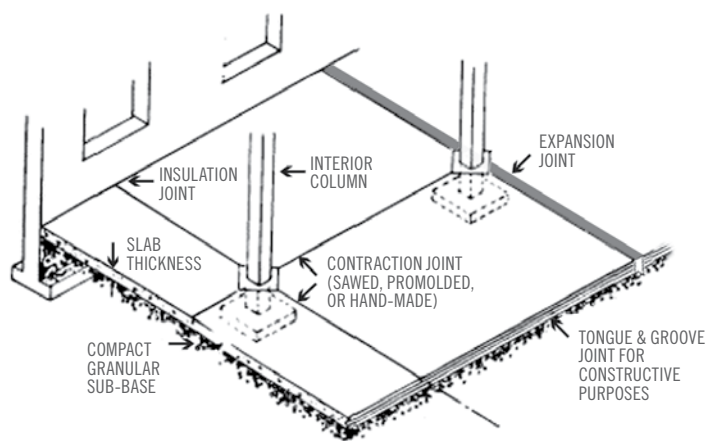
It is also important to select the correct filter(s) for the vacuum cleaners to ensure removal of all dust particles, some of which can be superfine.

## TYPES OF JOINTS



The joints in a concrete slab or pavement are intended to allow the concrete movements and prevent irregular and capricious fissures. These occur as a consequence of settlements, concrete shrinkage, temperature changes and stresses due to applied loads.

There are various types of joints. For each type we will adopt a different treatment depending on the characteristics, depth, movement, traffic, etc.



P. 14

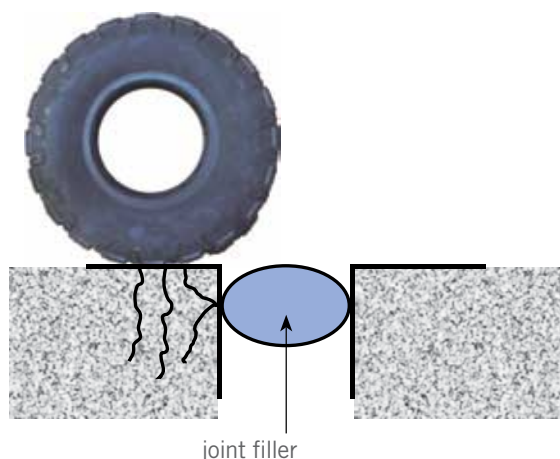
## TREATMENT OF JOINTS IN FLOORING EXPOSED TO FORKLIFT TRAFFIC

This construction detail is very important for intensive use industrial buildings, in which the joints are exposed to the FLT wheels, some of which are made from very hard and abrasive polymers (Nylon / Teflon).

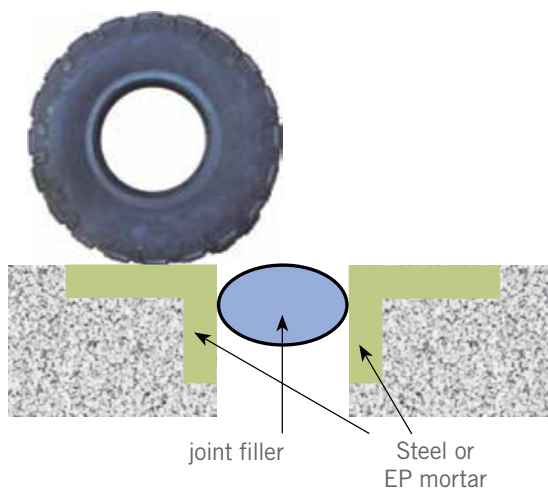
The mechanical load imposed, and the compressive strength of the joint tends to give problems at the apex of the seal as detailed in Scheme 1:

If the joint is reinforced with an epoxy mortar (or based on KRYPTANATE for faster drying), or by a steel plate, it gives greater strength to the concrete at this point, and prevents breakage at the top of the joint, as is illustrated in Scheme 2:

SCHEME 1



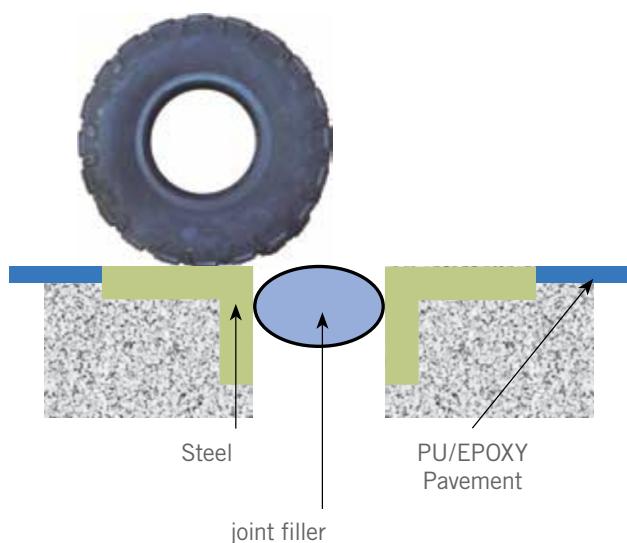
SCHEME 2



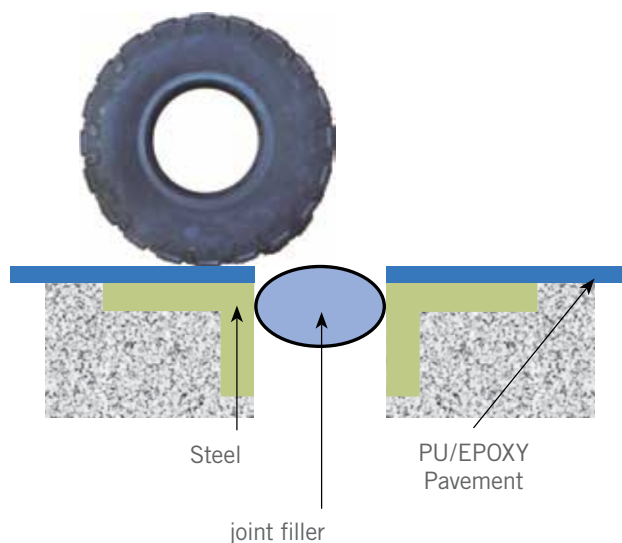


When both edges of the seal are already reinforced, you can also perform a treatment with polyurethane or epoxy resin self-leveling with two options shown in Schemes 3 and 4:

SCHEME 3



SCHEME 4



P. 15

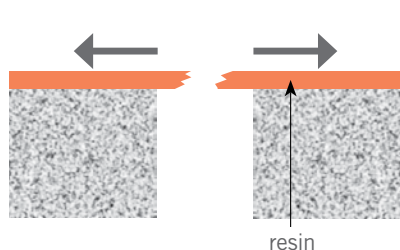
## COMMENTS ON JOINT TREATMENT

As a final comment, observe the following:

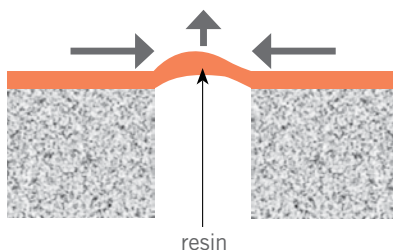
1. It is not advisable to fill moving joints with self-leveling resins, neither polyurethane nor epoxy. Filling-up these joints may lead to the following cases:

- a. If the job is conducted in summer months, joints will expand in winter, once temperatures drop, and there will be breakages at the point.
- b. If the job is conducted in winter months, joints will contract in summer as concrete expands and there will be wrinkles / waves formation at the joint.
- c. In the ideal scenario (neither a, or b) one must fill joints with a low modulus PU sealant (Rayston Flex 3000), allowing for sufficient movement at the joint.

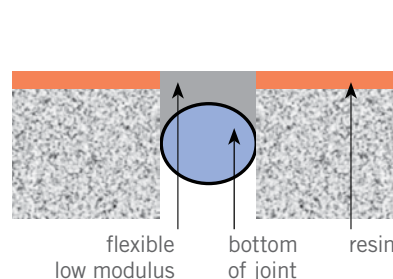
a SUMMER / WINTER



b WINTER / SUMMER



c RIGHT SYSTEM



2. Joints with movement are left open when resins are poured (one may also contemplate installing steel plates for reinforcement at this point in time. These will also help hold the self-leveling resins). Such joints will be filled with an appropriate low modulus sealant after priming the floor using enough material so that the joint rests onto something. For a better aspect, it is advised to use low modulus sealants RAYSTON FLEX 3000 in the same colour as the flooring top coat employed for each project, and with a sufficient amount so the caulk is always resting on the bottom of the board, alternatively use a background RAYFOND type joint bottom.

**FINAL NOTE:** In areas of treatment terminations (edges), resins must never be left so that they are “floating” or simply deposited on the pavement. To avoid this, make radial cuts in the flooring at those points where the treatments terminate, thus achieving a mechanical anchoring.

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## CONCLUSIONS ON SUBSTRATE CONDITIONS AND TREATMENT OF JOINTS

The process of analysis and preparation of the surface for the application of flooring is extremely important; investing resources here will impact directly on the final pavement durability of the system we intend to apply.

Undetected substrate moisture or inappropriate preparation may cause system failure even though the materials used are of high quality.

For new build installations: It is important to ensure that the concrete is delivered ready for subsequent treatment with resins.

When it comes to repairs or renovations, you should make an assessment of the existing contaminations, to determine the type of pretreatment required.

In all cases, mechanical treatment should be performed prior to the application of a floor covering. This could be Sanding, abrasive polishing, blasting or milling / scarifying.

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**NOTE:** We strongly recommend a pre-test or test “in situ”. If there are any doubts on site, then the installer should conduct a trial of the preparation and application of the system.

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P. 16



*Floor support after preparation and treatment of rupture joints with resin and sand, as a dry mortar*

We invite you to use the system selection table to choose which solution best fits your project needs

# HOW TO CHOOSE THE RIGHT RAYSTON SYSTEM

## SYSTEMS SELECTION TABLE

P. 17

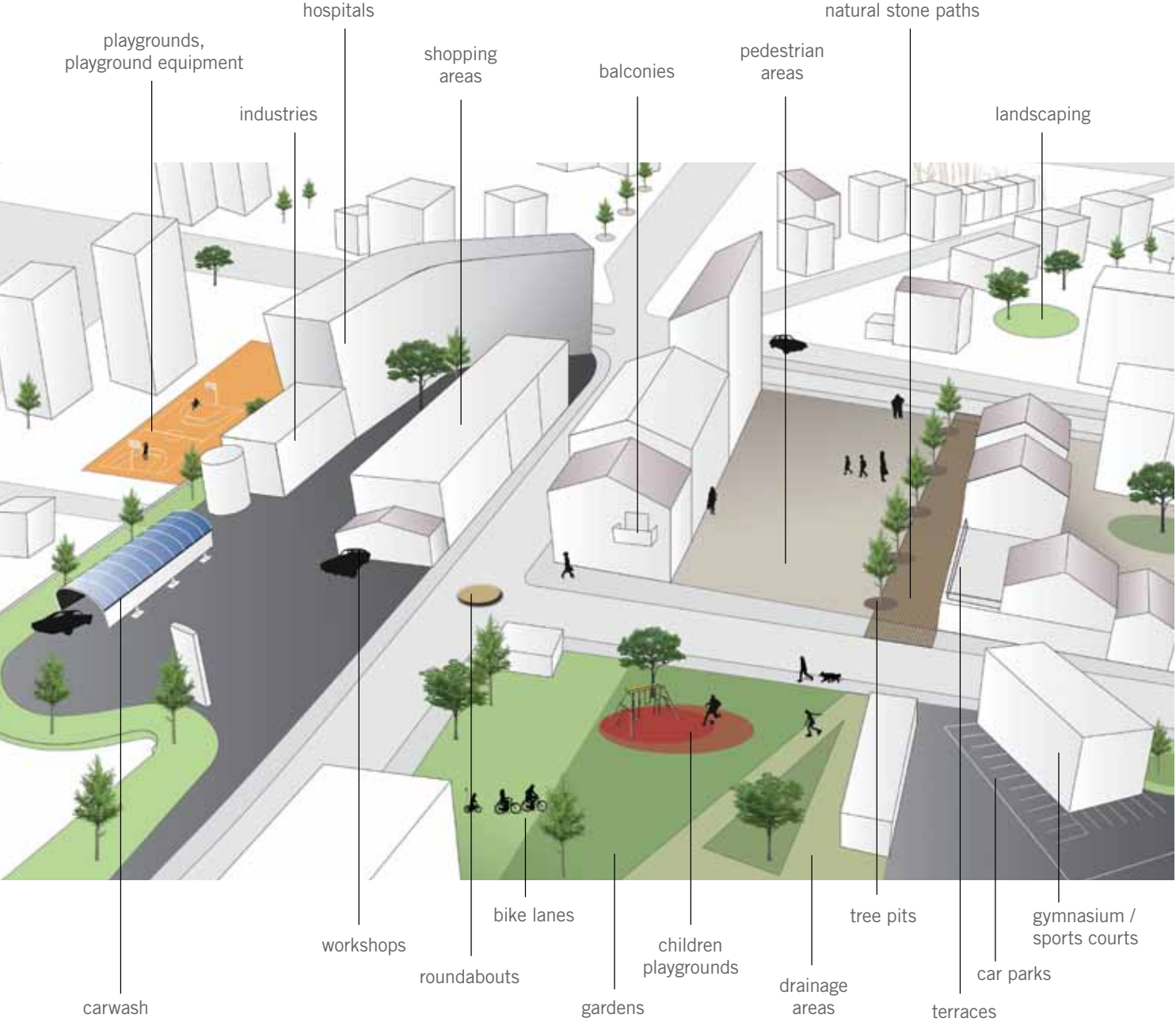
SYSTEMS	APPLICATIONS	
<b>PAINT SYSTEMS</b> COLODUR 60 COLODUR ECO KRYPTANATE M PAVIDUR EP AQUACOAT	Indoor & outdoor	<b>Sealing / protection</b> of concrete and resin flooring <b>Painting car parks</b>
	Indoor	<b>Painting floors:</b> industrial buildings, warehouses, exhibitions.
	Interior and exterior. Sealing with top coat is mandatory	<b>Industrial Flooring:</b> Industrial Flooring: factories, warehouses, workshops, meat processing plants, slaughterhouses, food industries, chemical industries, etc.
	Aliphatic	<b>Commercial floors:</b> offices, shops, malls, schools, function rooms, etc.
	Indoor	<b>Industrial Flooring:</b> factories, slaughterhouses, warehouses, workshops, chemical sites, etc. <b>Indoor circulation areas:</b> parking, ramps, walkways etc.
<b>SELF LEVELING SYSTEMS</b> PAVIFLOOR (high hardness) EP AQUANIVEL EP NIVEL PAVIFLEX (flexible) KRYPTANATE 100	Indoor & outdoor	<b>Commercial floors:</b> offices, function rooms, shops, gyms, shopping centers, etc.
	Indoor	
<b>MULTILAYER SYSTEMS</b> EP MULTILAYER EP MULTILAYER AGUA KRYPTANATE 100	Indoor & outdoor	
	Indoor	
<b>BONDED SYSTEMS</b> PAVISTONE RUBBER BINDER	Indoor & outdoor	Trails, theme parks, pedestrian zones, prestigious design offices, etc.
	Indoor & outdoor	Tree pits, slopes, terraces, roundabouts, zen gardens, playgrounds, recreation areas, etc.
<b>CONFORT/SPORT SYSTEMS</b> PAVIFLEX SPORT PAVIFLEX SPORT PLUS	Indoor & outdoor	Hospitals, exhibition halls, schools, kindergartens, shops, offices, gyms, etc.
	Indoor & outdoor	

To help you choose the right solution, please see the table below classified by fields of application, and / or needs

# POSSIBLE APPLICATIONS


## APPLICATION SELECTION CHART

P. 18




**NOTE:** Any of the systems can incorporate special additives to achieve hygienic and antibacterial properties


BASE



WATER



SOLVENT



100% SOLID

FIELDS OF APPLICATION			INDUSTRIES		FOOD											X	X	X							
					AUTOMOTION							X	X			X	X	X	X						
					ELECTRONIC							X	X	X	X								X		
					CHEMICAL		X					X	X		X						X	X			
					PHARMACEUTICAL		X					X	X		X	X	X				X	X			
					PETROL STATION																				
					CARWASH / WORKSHOPS			X				X	X								X				
					WAREHOUSES	X	X					X	X	X			X		X	X	X	X	X		
			HOSPITALS		CORRIDORS		X		X	X				X	X	X									
					LABORATORIES		X		X	X				X	X	X			X	X					
					WAREHOUSES	X	X					X			X	X	X	X	X	X	X				
					TRAFFIC AREAS	X				X		X							X	X					
			SHOPPING AREAS		HALL & CORRIDORS	X					X	X			X	X	X		X	X	X				
					SHOPPING AREAS	X					X	X					X		X	X	X	X			
					FISH SHOP / BUTCHER'S	X	X					X					X		X	X				X	
					PARKING/CARSWASH	X	X	X		X			X						X	X					
					WAREHOUSES	X	X	X				X	X						X	X	X				
					AREAS DOWNLOAD							X	X	X					X	X	X	X	X		
			DECORATIVE FLOORS		SHOP	X			X	X	X	X		X		X		X		X	X				
					RESTAURANT	X			X		X	X		X		X		X		X	X				
					NIGHT CLUB / PUBS	X	X	X	X		X	X		X		X		X		X	X				
					STUDIES PHOTOGRAPHY / TV					X		X	X	X	X				X	X	X				
					MUSEUMS / GALLERIES	X			X	X	X	X		X		X		X		X	X				
					TERRACES / BALCONIES				X			X				X					X				
PARCS		TRAFFIC AREAS																		X					
		PLAYGROUND CHILD																			X				
		TREE PITS																X	X	X					
		ROUNABOUTS																	X						
SPORTS INSTALLATION		FOOTBALL Stadium, Corridors				X							X			X	X								
		CAFES / SERVICES				X							X			X	X								
		BIKE LANES				X	X		X									X			X				
		TRACKS (Tennis, Padel, Squash)				X	X						X	X							X				
NEEDS OF PAVEMENT			CHEMICAL RESIST.		VERY HIGH		X					X			X	X	X		X	X					
					PERMANENT																				
					OCCASIONALS	X		X	X	X	X		X											X	
			MECHANICAL RESIST.		HIGH						X	X			X	X		X	X	X	X	X			
					MEDIUM	X	X	X	X	X					X	X							X		
					LOWER																		X		
			OTHERS		EASY CLEANING	X	X	X	X	X	X	X		X		X									
					ANTISLIP	X	X	X	X	X	X	X	X					X	X	X					
					ELASTIC				X							X								X	
					OUTDOOR				X	X		X								X		X	X		

# DESCRIPTION OF RAYSTON SYSTEMS

Krypton Chemical has developed Rayston Flooring systems in the different technologies that cater to different needs of floors:

<b>1. PAINT SYSTEMS</b>	<b>21-23</b>
Colodur / Colodur eco / UV Rayston Varnish / Pavidur / Kryptanate M / EP Aquacoat	
<b>INNOVATION: UV Rayston System</b>	<b>24-25</b>
<b>Projects executed</b>	<b>26-27</b>
<b>2. SELF-LEVELING SYSTEMS</b>	<b>28-31</b>
High hardness <b>Pavifloor</b>	<b>32</b>
Flooring Level Design	<b>33</b>
<b>EP Aquanivel/EP Nivel</b>	<b>34</b>
<b>Kryptanate 100</b>	<b>35</b>
Flexible <b>Paviflex</b>	<b>36</b>
<b>Projects executed</b>	<b>37-39</b>
<b>3. MULTILAYER SYSTEMS</b>	<b>40-41</b>
<b>EP Multilayer</b>	<b>42</b>
<b>EP Aqua Multilayer</b>	<b>43</b>
<b>Kryptanate Multilayer 100%</b>	<b>44</b>
<b>Projects executed</b>	<b>45-46</b>
<b>4. BONDED SYSTEMS</b>	<b>47</b>
<b>Pavistone (polyurethane/epoxy)</b>	<b>48-52</b>
<b>Rubber binder</b>	<b>53-55</b>
<b>Projects executed</b>	<b>56-57</b>
<b>5. COMFORT SYSTEMS / SPORTS</b>	
<b>Paviflex Sport / Sport Plus Paviflex</b>	<b>58-60</b>
<b>Projects executed</b>	<b>61</b>
<b>INNOVATION: ANTIBACTERIAL SYSTEM</b>	<b>62-63</b>



# 1

## FLOORING PAINT SYSTEMS

### COLODUR / COLODUR ECO / UV RAYSTON VARNISH PAVIDUR / KRYPTANATE M / EP AQUACOAT

P. 21

These systems are suitable for indoor or outdoor, and deliver THIN coatings, in either TRANSPARENT or COLOURED finish.

Our flooring paint systems include the following steps:

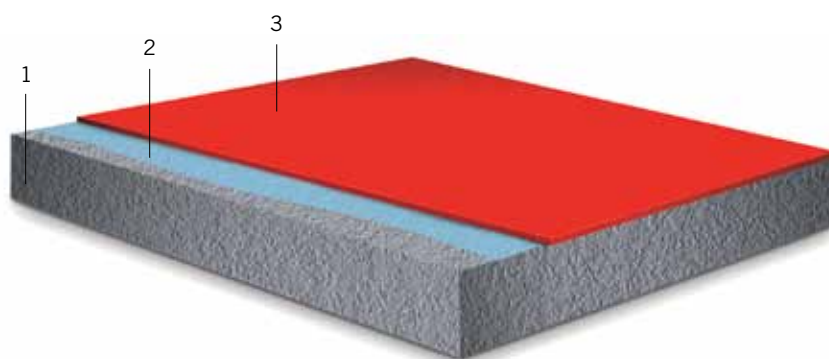
#### 1. PREPARATION OF SUPPORT

Besides the general instructions on page 11, the substrate moisture content must be controlled.

The maximum water content permissible depends on each product to be applied.

Water based systems are more tolerant to moisture in substrates.

It is important to fully remove previously applied systems or coatings.



1. Support
2. Primer (1 or 2 layers).
3. Resins\*, to choose from:  
COLODUR  
COLODUR ECO (solvent free)  
PAVIDUR  
KRYPTANATE M  
EP AQUACOAT (solvent free)

*\*1 or 2 layers. Check the technical specifications of each product.*



## 2. PRIMER

Primer type selected depends on the medium (previously prepared), the state of the substrate, and according to the following table:



TYPE OF SUPPORT	EPOXY 100 + SOLVENT	ACTIVATOR PU PRIMER	IMP. H / EP AQUAPRIMER
Dry & Porous Concrete or mortar	X		
Ceramic or vitrified tile		X	X
Concrete or Mortar with humidity (superficial)			X
Asphalt			X
Brick	X		

Keep in mind that the primer selected requires the adoption of specific measures for their application and number of layers required, etc. we recommend testing on the floor in question to ensure complete suitability.

Site conditions (indoor, permanent work zones, flammability) may necessitate the use of a solvent-free primer (primer H - EP Aqua Primer), you must also take into account two factors that significantly determine success with these products:

- The evaporation of water prior to application of the resin coating must be total. It is therefore necessary to conduct moisture content measurements in poorly ventilated premises with ambient high humidity before using on such primers.
- The degree of penetration into the concrete of water based resins is much lower than with solvated resins, so it requires a significant addition of water in order to obtain sufficient penetration into the substrate (having to respect subsequently the time duration required for evaporation of water).

## 3. TREATMENT OF CRITICAL AND DETAIL POINTS

- Existing cracks and small joints shall be sealed with single component / low modulus sealant polyurethane RAYSTON FLEX 3000. It is important to seal joints and cracks "between coatings", i.e. on primed substrates and with good adhesion, so it is possible to apply paint or resin over the filled joint / cracks.
- Expansion joints must not be coated.
- Sides: must be protected with masking tape to avoid staining side walls.
- Limits of colour or paint area. Also protect with masking tape.



**NOTE:** It is very important to lift the masking tape after a few minutes, preventing that product polymerizes on it, because otherwise you will need to cut, or run the risk of pulling the pavement, and lifting up the polymerized resin.





## 4. LAYER OF PAINT RESIN

Many solutions are available from the Rayston range:

**1. COLODUR 60.** Aliphatic polyurethane single component, solvent based, fast drying (12-24h.), And stable to light and UV rays.

**2. EP AQUACOAT.** Product suitable only for interior (not subjected to UV). Waterborne Epoxy 2 component, of glossy appearance and high strength.

**3. COLODUR ECO.** Product WITHOUT SOLVENT.  
2 component waterbased aliphatic polyurethane, stable to light and UV rays. Provides a film with high chemical resistance and mechanical properties (abrasion)

**4. PAVIDUR.** Product suitable only for interior (not subjected to UV). Aromatic polyurethane single component, solvent based, fast drying (12-24h.), and economic.

**5. KRYPTANATE M / KRYPTANATE SPRAY.** Hybrid System Urea / Urethane ultra-fast drying, for manual system, roll or hot mechanical projection. Available in 2 versions:

Hot Spray: No solvent (2-4h drying)

Application (roller): With solvent (4-6h drying)

Depending on the thickness, the support, and the desired effect, apply one or more coats of resin (see data sheet for each product for the application rates recommended), In general terms do not exceed a total of 200 micron thickness in the final coating.

Each of these products can be applied using different techniques (short or long fiber rollers, airless spray, flat flexible rubber, spreader, etc.), depending on the system best suited to the circumstances of each job : and the desired finish being smooth or skid resistant (see certificate. page 7).

**6. RAYSTON UV VARNISH.** Instant cure product, using a special machine.

**NOTE:** It is recommended that applications are always conducted by Rayston approved installers.

## 5. FINISHING

RAYSTON flooring systems allow great versatility regarding possible finishes, of which the most important are listed:

- Glossy or matte
- RAL Colour
- **Anti-skid:** incorporation of RAYSTON anti-slip additive to obtain a uniform texture that prevents slippage and gives high aesthetic finish
- **Neutral or coloured aggregates:** dusting between resin layers of coloured sand (size 0.2 to 0.4 mm.), With multiple possible tonalities, which also provides both an anti-skid effect and great aesthetics.
- Coloured flakes
- Transparent glass beads
- Corundum (high strength and toughness)

## PERFORMANCES

The performance of this type of pavement will depend on the load the system is to be subjected to and the periodic maintenance to be done.

In no event can we expect a higher impact resistance than that of the concrete pavement itself or support on which they work: Other performance benefits are:

- **Avoid dust generation**
- **Resistance to abrasion**
- **Anti-stain** (resists fluid absorption)
- **Anti-slip** (in case of adding elements to give anti slip properties), to comply with safety standards in every country).
- **Scratch resistance** (much higher than for other technologies or paints)

## ADVANTAGES

The use of Rayston flooring paints gives the following advantages:

1. Achieving a clean flooring that does not generate dust and resists staining or absorption of liquids.
2. Significant improvement of the visual image and possibilities to obtain combinations of colours and shades in line with the corporate image.
3. Improved working conditions and light availability in the workplace, or car parking areas.
4. Ultra quick drying, commissioning areas almost immediately, with KRYPTANATE system.

**NOTE:** It is recommended in any case to protect the pavement with RAYSTON WAX before putting into service.  
(see data sheet)



## LAST GENERATION UV VARNISH FOR IN SITU FLOORING

### UV RAYSTON System

flooring finish and top coat, for instant cure and intensive use.

This system allows overnight installation and returning into service within a few hours. This is possible for both new construction and renovations.

P. 24

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### A REVOLUTIONARY MACHINE

- Rayston's UV varnish dries after exposure of the resin to UV rays projected by a mobile machine, equipped with a lamp and all necessary safety protections.
- One person can easily handle this machine.
- The execution speed of the system allows conducting works with minimal interruption of the company's business, compared with conventional methods.
- The high gloss polyurethane resin offers very high performance (scratch and abrasion resistant, elasticity), it is ideal for the repair and rehabilitation of floors in continual service.

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It is an ideal system to  
rehabilitate worn  
pavements subjected  
to intense traffic  
without closing the area  
to the exclusion  
of public

### CONCLUSION

**RAYSTON UV VARNISH can meet high demands on pavements open to the public:**

1. Beautiful finish in high gloss, high elasticity properties and with great scratch resistance and resilience.
2. Execution of the work in a short period of time without altering the normal operation and with immediate commissioning.
3. Solvent-free products applied without special protective measures.

### APPLICATIONS

Commercial flooring  
Offices  
Stores  
Shopping centers  
Halls & corridors  
Public areas  
Exhibitions  
Museums / Galleries  
Airports  
Train stations  
Underground / Subway

## BEFORE

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## PROCESS

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*Prepare floor with a sanding disc machine, in order to open the pores in the pavement and improve penetration and mechanical adhesion of the system.*



*Application of the primer / fast curing RAYSTON K PRIMER*



*Application of the UV resin*



*Curing the resin by UV machine, drying instantly*

## AFTER

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# SOME WORKS CONDUCTED WITH PAINT SYSTEMS

## COLODUR 60

P. 26



*Private house*



*Entrance to hospital (Czech Republic)*



*Detail kitchen in private home*



*Living room in private housing residence*



*Square entrance to hospital (Czech Republic)*



*Bus station in Zaragoza TGV station (Spain)*



*Commercial shop in Oviedo (Spain)*



*Logistics warehouse*

## COLODUR ECO

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*Pit in bus workshop*



*Exhibition center car park in Reus (Tarragona, Spain)*

## PAVIDUR

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*Sealing over decorative cementitious screed in Milan (Italy)*

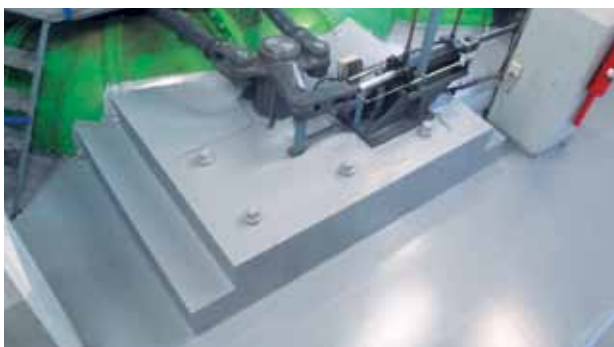


*Car park 600 m² in Reus (Tarragona, Spain)*

P. 27

## EP AQUACOAT

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*Hydroelectric power station Industrial pavement*



*Shopping center Car park in Mataró (Barcelona, Spain)*

## KRYPTANATE M

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*Corridor in geriatric residence in Beasain (Spain)*



*Private house in Valencia (Spain)*



## 2

# SELF-LEVELING SYSTEMS

P. 28

## PAVIFLOOR / EP AQUANIVEL / EP NIVEL PAVIFLEX / KRYPTANATE 100

Self-leveling systems of high thickness (2-6 mm.).  
Devised for obtaining a uniform and smooth high performance floor.

Its characteristics vary depending on the type of system selected.



Factory showroom



### GENERAL ASPECTS

These systems are designed to work on concrete surfaces, especially in industrial floors, parking garages and workshops where abrasion, traffic resistance requirements are very high.

To coat a surface with guarantees, it is important to follow recommendations about the specific primer for each case.

**Depending on the floors desired finish and duties, we propose two product options:**

#### 1. HIGH HARDNESS FLOORING

- PAVIFLOOR
- EP AQUANIVEL
- EP NIVEL
- KRYPTANATE 100

#### 2. FLEXIBLE / RESILIENT FLOORING

- PAVIFLEX

## 1. SUBSTRATE PREPARATION

The preparation is intended to obtain a consistent surface, solid and with sufficient porosity to provide maximum adhesion of the coating to the substrate.

The surface must be clean, dry and free of dust, grease and foreign matter that could impair or prevent proper adhesion.

For a smooth /even finish using these self-leveling systems, irregularities in the support must be minimal, and no greater than half the thickness of the coating that we will apply.

The preparation system selected depends on the state of the existing support and flooring thickness required. For leveling systems from 2 to 6 mm. recommendations are:

**SCARIFYING:** A preparation method that can remove significant irregularities, leaving shallow incisions on the treated surface.

For optimum performance it is necessary to perform two passes, the 2nd at 90 degree angle to the first. In cases where the incisions are too deep then a final pass with a diamond grinder will regularize the surface slightly.

**BLASTING:** The impact of steel balls projected at high pressure and high speed, provides different levels of treatment dependant on the size and projection of the steel balls.

Once the mechanical treatment of the surface is complete then deep vacuum cleaning is required to remove any traces of dust and particles that remain on the surface.

Application of self-leveling flooring systems on tile supports usually requires preparation with FIBER NET mesh fixed to the support, and subsequent impregnation with epoxy primer, saturated with aggregate in size from 0.4 to 0.9 mm.

P. 29

## 2. PRIMER

Selection of the primer type is dependent on the substrate and its condition, according to the following table:



TYPE OF SUPPORT	EPOXY 100 + SOLVENT		
	ACTIVATOR PU PRIMER	IMP. H / EP AQUAPRIMER	
Dry & Porous Concrete or mortar	X		
Ceramic or vitrified tile		X	X
Concrete or Mortar with humidity (superficial)			X
Asphalt			X
Brick	X		

It should be noted that the chosen primer, requires the adoption of specific measures in its application, implementation, number of layers, etc. This must include testing on the floor in question, to ensure complete suitability. Under certain site conditions (indoors, permanent work zones, flammability) a solvent-free primer should be used (Humidity Primer - EP Aquaprimer), and should take into account two factors that will determine the success of the use of this product type:

- The evaporation of water prior to application of the self-leveling resin floor. (It is important to conduct measurements of humidity both in the substrate and in the air, to ensure proper curing and absence of water).
- The degree of penetration into the concrete of water based resins is much lower than that of solvented resins, so consequently may require a significant addition of water in order to obtain sufficient penetration depth into the support (having to respect subsequently the time required for evaporation of the water).

**NOTE:** We recommend using:

- 100% epoxy primer for polyurethane systems and 100% solids EPOXY SYSTEMS.
- Water based epoxy primer for water based systems (EP AQUANIVEL).



In some circumstances a primer may require more than one application to fully penetrate and seal the substrate, this depends on the degree of absorption of the support. For example, for epoxy primer 100 it is advisable to apply two coats (wet on wet), the first with the addition of 10 % Rayston Solvent into the primer and the second pure primer, to give good penetration and sealing of the pores in the concrete. It is also common practice to make a light dusting with aggregate into the 2nd layer of wet pure Epoxy primer to improve the mechanical “grip” of the system.

Leveling resins have high cohesion, it is therefore important that the adhesion obtained on any support is greater than the intrinsic cohesion of the material; otherwise trouble may occur over time due to movements, impacts, etc. In these cases, if the bond is not high enough, the floor could lift and crack.

**For a floor using deep (thick) self-leveling resin to achieve a perfect finish, free from defects, is an absolute must to ensure there are no pores in the support prior to the application of self-leveling resin, this will avoid the appearance of pin holes and defects. To completely seal the substrate, you can opt for the two following options:**

- a. Apply the necessary extra amount of pure or diluted primer (besides that which has already been applied) to ensure a total sealed support and a glossy appearance.
- b. Applying a first layer of 0.5 kg/m<sup>2</sup> of the self-leveling resin thereby acting as a porosity sealer.



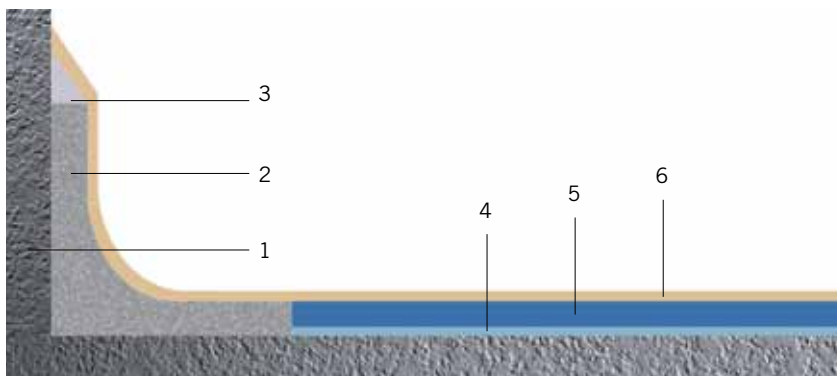
P. 30

### 3. TREATMENT OF CRITICAL AND DETAIL POINTS

- a. **Joints / cracks for elastic systems.** Shall be sealed with polyurethane low modulus sealant (RAYSTONFLEX 3000). It is important to seal the joints or cracks between coats, i.e. on substrates already primed and with good adhesion so that they can work later on and remain bonded. In very degraded areas, or if movements are expected, it is advisable to strengthen the self-leveling resin with silica aggregate size 0.4 to 0.9 mm.
- b. **Expansion joints.** Must not be coated. Resin should be cut at these points, and joints must be filled with a low modulus sealant before applying the final coating layer (*see page 14*).
- c. **Up stands.** Must be protected with masking tape to avoid staining them. It is also possible to install butyl tapes (Butyl Tex). It is common practice to fill the bottom edge at up stands with cement or special resins to obtain a self / easy to clean round-shaped angle.
- d. **Colour boundaries / terminations, or areas of resin.** Should also be protected by film or masking tape. It is advisable always perform a cut of at least 1 mm. width and 2-3 mm. of depth so that the resin can “anchor” in the groove.



#### HORIZONTAL / VERTICAL (corners)



1. Support
2. Mortar
3. Mastic
4. Primer
5. Self-leveling resin
6. Finishing



## 4. SELF-LEVELING RESIN LAYER

The support must be properly primed and prepared (total absence of pores). Otherwise, this could result in significant bubbles and pin holes. The application is made by spreading the material by a trowel or triangular tooth blade, to ensure even application. Then ASAP go over the surface applied with a spiked roller to facilitate the bursting, of air bubbles trapped during mixing and spraying.

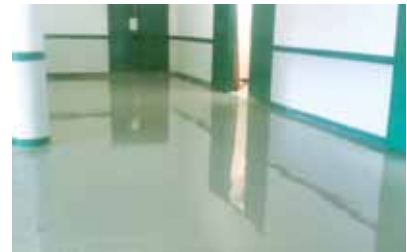
a. Mix the resin component, for a few minutes. Then add the isocyanate and mix in the container for a few more minutes. Further mixing then takes place by transferring to another container and mixing for a few more minutes. This avoids dead areas and unmixed product in the container which will result in "soft" areas in the finished floor.

b. Consistent control of the mixing time, so as to be as consistent as possible from batch to batch and to meet the conditions of the product and of the works (temperature, moisture, reactivity,...).

c. Control the time between mixing, pouring and spreading the product, minimizing the risk that the system begins to react in the container and the self-leveling properties are lost. This is of great importance when performing work at high temperatures and high humidity.



P. 31



## 5. FINISHING

EPOXY self-leveling systems (yellow slowly and can be left visible). PAVI-FLEX and PAVIFLOOR systems are preferably finished with a non-solvent top coat (COLODUR ECO) or Solvented (COLODUR 60 / Pavidur / Kryptanate M) in the desired RAL colour.

Kryptanate system 100 being aliphatic is an alternative to polyurethane and epoxy systems which yellow over time. It also provides ultrafast drying for minimum cycle times.

These finishing (top coat) resins also provide the following advantages:

- Increased resistance to scratching and wear (abrasion)
- Low visibility of scratches when using these finishing resins (top coats) applied pigmented or unpigmented, i.e. they do not include mineral fillers.

**NOTE:** As a final protective finish apply Rayston Wax. (see data sheet).

## PERFORMANCES

The performance of this type of floor will depend on the load it will be subjected to and the periodic maintenance schedule planned.

This gives some important benefits to the floor treated with these system such as:

- **Smooth effect**
- **High hardness and impact resistance** (CE Mark)
- **Compression strength**
- **Maximum anti-slip safety** can be achieved by dusting silica aggregates of various granulometry, directly on the fresh resin, followed by subsequent sealing and finishing resins. According to the UNE-ENV 12633: 2003, and safety standards for every country.

## ADVANTAGES

**RAYSTON self-leveling flooring systems offer the following advantages:**

1. It is a self-leveling flooring, high performance and resistant to impact, abrasion, etc. (see certifications in page 8).
2. Forms a continuous floor, smooth and clean, no dust, easy to clean and will not absorb liquids.
3. Optional anti-slip system. Maximum safety in case of flooring in wet or damp areas.

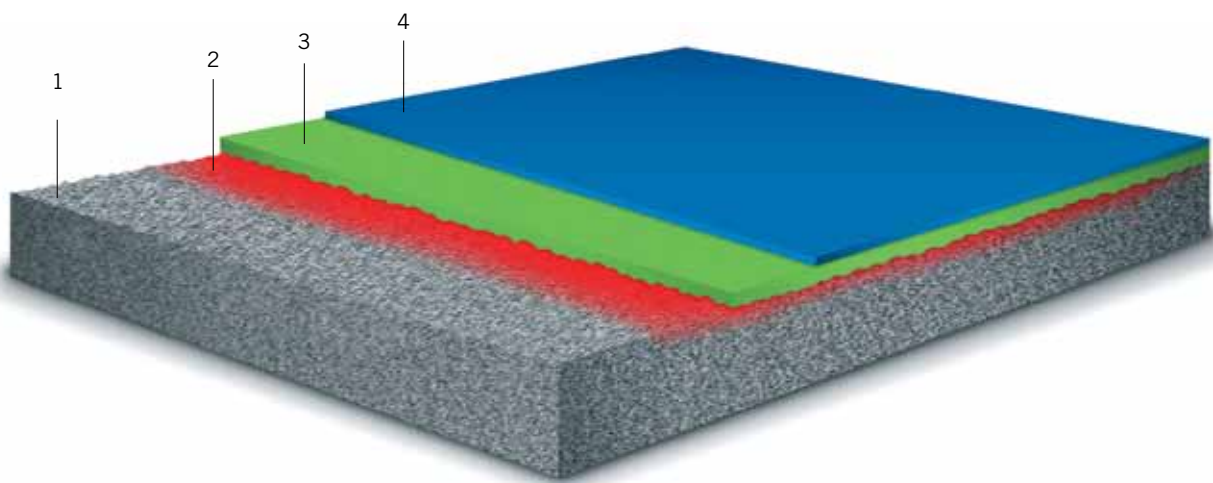
**For anti-slip effect there are three options:**

- Sprinkle silica aggregates directly onto the fresh resin, and then subsequently seal with top coat resin finishes.
- Sprinkle glass microspheres or silica aggregate between 2 top coat layers.
- Add anti slip additive to the top coat and spread with a roller.

# SYSTEM PAVIFLOOR

**INDOOR AND OUTDOOR HIGH PERFORMANCE SELF-LEVELING FLOORING SYSTEM** 2 component, 100% solids, aromatic polyurethane with high impact resistance: 1.3 kg/m<sup>2</sup> per mm. Thickness: 2-6 mm.

P. 32



1. Support
2. Primer
3. Pavifloor
4. Desired finish:
  - Without solvent = COLODUR ECO
  - With solvent = COLODUR 60 / PAVIDUR / KRYPTANATE M



*Store in Toulouse airport (France)*



*Common area in lobby*

## APPLICATIONS

### Industrial coatings:

Factories

Slaughterhouses

Stores

Food industries

Workshops

Chemical industries

Meat & poultry processing

...

## THE FLOOR WITH GREAT DECORATIVE POTENTIAL

# LEVEL DESIGN FLOORING SYSTEM

## PROCESS APPLICATION

1. The preparation of the support, the application of the primer and the treatment of critical points are the same as for leveling systems. (see page 26)

2. Pavifloor or Kryptanate 100 are applied in the desired colour, and quartz powder / silica sand are added in fine particle size (0.1 to 0.3 mm).

3. Spread with rake or notched trowel. Note that adding fillers decreases the leveling behavior, giving a texture in the cured resin.

4. Allow to dry completely. The drying time varies depending on the environmental temperature. Generally this phase requires approximately 48h at 20° C.

5. When dry, sand with a machine first with hard disk with a coarse grain (320 grit) and then a second phase, with a finer sanding disk (600 grit) leaving some relief or "texture" on the pavement. Remove all dust with a vacuum cleaner.

**6. The finish depends on the final look required. Several options are available:**

**6a. COLODUR ECO**  
Rayston in two thin layers (100 to 150 gr./m<sup>2</sup> each).

**6b.** For a semi-gloss, COLODUR ECO Rayston + ANTI SLIP. Adding anti-slip, to dull the shiny appearance. Two very thin layers (100 to 150 gr./m<sup>2</sup> each).

**6c. COLODUR ECO MATE** also 2 layers of 100 to 150 gr./m<sup>2</sup>.  
Do not reinstall the furniture until the system has dried completely, usually between 2 and 3 days at 20° C.

7. You can also apply RAYSTON WAX to protect the surface.

## LEVEL DESIGN FLOORING SYSTEM

helps transforming an ordinary floor into a decorative, aesthetically appealing, continuous solution.

It is processed as self-leveling screed and the final aspect offers many more advantages.



Private house

P. 33

## ADVANTAGES

- It is a self-leveling or semi self-leveling flooring with high performance and resistance to impact, abrasion, etc. (see certifications in page 8).

- Provides continuous flooring (seamless), smooth and clean, no dust, easy to clean and will not absorb liquids

- Solvent free

- Adding fillers reduces the amount of Pavifloor / Kryptanate 100 and increases the total system thickness, leaving a textured finish

- The low thickness of this system avoids having to shorten door heights in house refurbishing projects

- Easy maintenance

- Aesthetic

- Alternatively, you can use this system with Kryptanate 100, obtaining a UV stable floor without **yellowing**.

## APPLICATIONS

Offices

Stores

Commercial floors

Public areas

Libraries

Industrial flooring

Houses / lofts

Restaurants

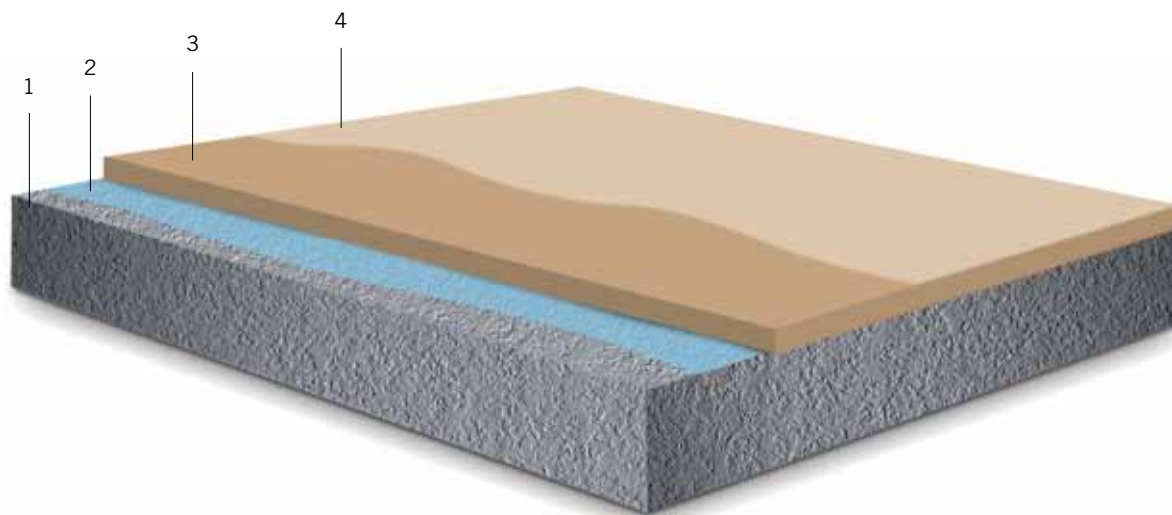
Municipalities

...

**NOTE:** The Pavifloor system fades over time, so you should consider this when choosing a specific colour or shade.

## SYSTEMS

# EP AQUANIVEL / EP NIVEL



P. 34

### EP AQUANIVEL RIGID SYSTEM MADE FROM EPOXY RESINS WATER BASED

Consumption: 1.8 kg/m<sup>2</sup> per mm. / Thickness: 2-3 mm.



Industrial floor

#### EP AQUANIVEL

1. Support
2. Primer
3. Self-leveling EP AQUANIVEL
4. Varnish or coating (optional)\*  
COLODUR ECO

*\*The sealing improves scratch resistance*

#### APPLICATIONS

##### Floors:

Factories

Stores

Automotive

Car parks

### EP NIVEL RIGID SYSTEM MADE FROM 100% SOLIDS EPOXY RESIN

Consumption: 1.5 Kg./m<sup>2</sup> per mm. / Recommended thickness: 2-3 mm.

High gloss / high performance: resistance to compression and traffic.



Mechanical workshop

#### EP NIVEL

1. Support
2. Primer
3. Self-leveling EP NIVEL
4. Varnish or coating (optional)\*  
COLODUR 60

*\*Top coats improve scratch resistance*

#### APPLICATIONS

##### Floors:

Factories / Warehouses

Automotive / Car parks

Chemical industries

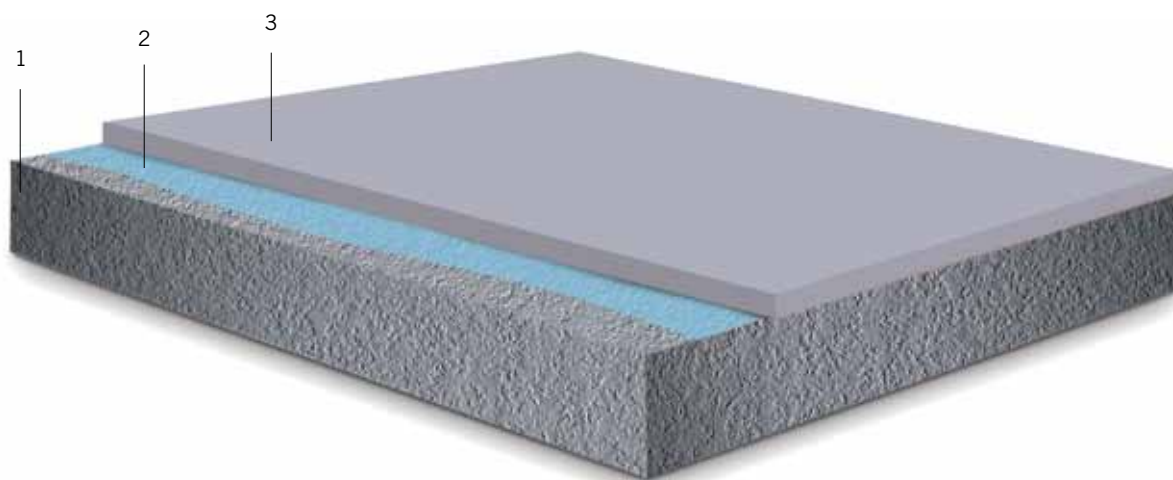
Decoration

Hospitals

# SYSTEM KRYPTANATE 100

**HIGHLY DECORATIVE SYSTEM BASED ON 100% SOLIDS ALIPHATIC RESINS**

Consumption: 2 kg/m<sup>2</sup> per mm. / Thickness: 1.5-2 mm.



P. 35

1. Support
2. Primer
3. Self-leveling KRYPTANATE 100 + fillers



*Children room floor*



*Dining room in private housing*

## APPLICATIONS

### Commercial floors:

Offices

Stores

Gyms

Shopping center

Sports courts

Colleges

...

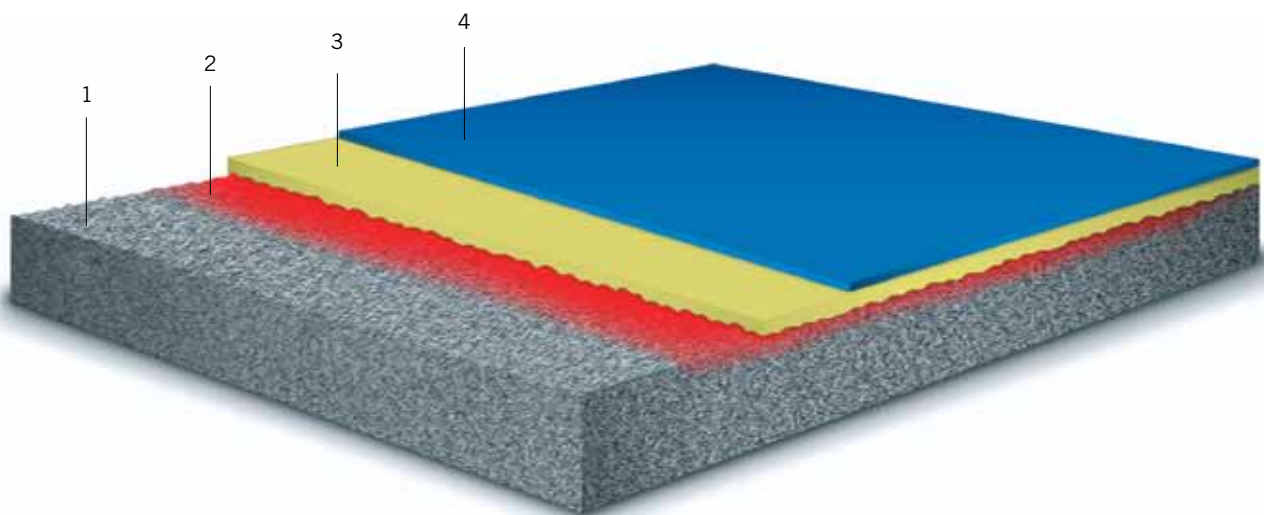


# SYSTEM PAVIFLEX

## COLOURED FLEXIBLE SELF-LEVELING FLOOR FOR OUTDOOR OR INDOOR APPLICATIONS

Aromatic polyurethane elastic system, 2 components, 100% solids.  
Consumption: 1.3 kg/m<sup>2</sup> per mm. / Thickness: 2-6 mm.

P. 36



1. Support
2. Primer
3. Flexible self-leveling resin PAVIFLEX
4. Desired finish:  
Without solvent = COLODUR ECO  
With solvent = COLODUR 60 / PAVIDUR / KRYPTANATE M



*Furniture company floor*



*Childrens clothing store*

## APPLICATIONS

### Commercial floors:

Offices

Stores

Gyms

Shopping centers

Sports courts

Colleges

...

# SOME WORKS UTILISING SELF-LEVELING SYSTEMS

## KRYPTANATE 100

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*Aliphatic Kryptanate 100 flooring and decorative flakes*



*Hall in institutional building*

P. 37

## PAVIFLOOR

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*Room in private house (France)*



*Common area in residential building*



*Mechanical workshop of buses*



*Industrial warehouse*



*School classroom*



*Logistics warehouse*



P. 38

*Sports center*



*Kids wear store*



*Detail union with wood flooring*



*Detail in stairs*



*Changing room in gymnasium*



*Sports shop*



*Common area / room in building*



## AQUANIVEL

---



P. 39

*Geriatric residence in Beasain (Spain)*

## EP NIVEL

---



*Bathroom in private house*



*Refurbishment of a room*



*Hall in company*



*Housing refurbishment*



*Private house*



# 3

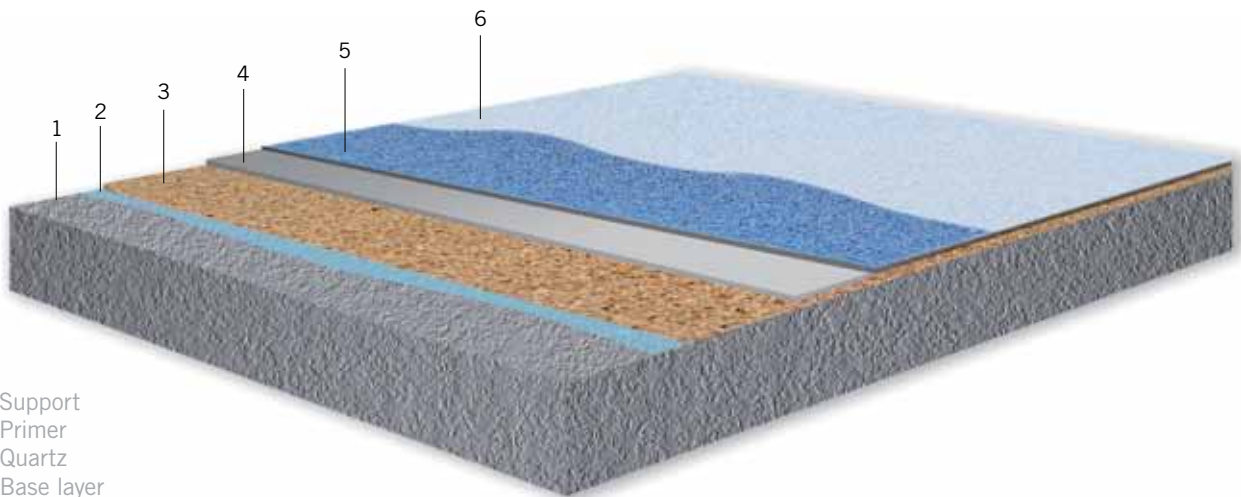
## MULTILAYER SYSTEMS

P. 40

### EP MULTILAYER / EP MULTILAYER AQUA KRYPTANATE MULTILAYER 100

#### HIGH THICKNESS MULTILAYER SYSTEMS (2-4 mm.)

Application is based on different layers of resins and aggregates designed for obtaining a uniform and high performance rough floor. Its characteristics vary depending on the type of system selected.



1. Support
2. Primer
3. Quartz
4. Base layer
5. Quartz
6. Finishing / sealer / top coat

#### GENERAL ASPECTS

These systems are designed to work on concrete surfaces, especially in industrial floors and car parks where strength requirements are very high.

The type and size of quartz aggregates used in the system are responsible for the final aspect and the degree of anti-slip of the system.



*Order handing area in warehouse*

## SUPPORT PREPARATION

The preparation is intended to obtain a regular substrate, which is strong and has sufficient porosity to obtain maximum adhesion of the coating to the substrate. To achieve this, the surface should be clean, dry and free of dust, grease and foreign matter that could impair or prevent proper adhesion.

To achieve a regular finish in multilayer systems, irregularities must be no greater than  $\frac{1}{2}$  the desired thickness of the multilayer system.

The preparation method depends on the state of the support. For multilayer systems 2 to 4 mm is the recommended thickness.

### SCARIFYING

A method that can remove significant irregularities, leaving shallow incisions on the treated surface. For optimum performance it is necessary to perform two passes the 2nd at 90 degrees to the first.

In cases where the incisions are too deep then a final pass with a diamond blade grinder will regularize the surface slightly.

### BLASTING

The impact of steel balls projected at high pressure and at high speed. Different levels of roughness can be achieved dependant on the size and projection of the steel balls.

Once the mechanical treatment of the surface is complete then a deep vacuum is required to remove any traces of dust and particles that remain on the surface.

Application of multilayer flooring systems on tile supports usually requires preparation with FIBER NET mesh fixed to the support and subsequent impregnation with epoxy primer saturated with aggregate in size 100 and from 0.4 to 0.9 mm.

## MULTILAYER RESIN LAYER

These three multilayer systems operate on the same basis: one product serves as a primer, base coat and finally a sealer / top coat, according to the diagram on the previous page.



Application of base coat

P. 41

## ADVANTAGES

**RAYSTON Multilayer flooring systems provide the following advantages:**

1. High performance, excellent mechanical strength, chemical resistance and strong adhesion to the substrate, indoor use only.
2. They are very economical because it is a single product system. The same product is used both as a primer, base coat and finish coat.
3. Anti-skid system, available with different levels of roughness.

## APPLICATIONS

### Industrial floors:

Factories

Warehouses

Chemical Industries

Slaughterhouses

Workshops

...

### Indoor circulation areas:

Car parks

Pedestrian walkways

Access ramps

...

### Commercial floors:

Offices

Multifunction rooms

Stores

Gymnasiums

Shopping centers

...

## SYSTEM

# EP MULTILAYER

### MULTILAYER SYSTEM BASED ON 100% SOLIDS EPOXY RESINS FOR INDOOR AREAS

System with excellent mechanical and chemical resistance for indoor use only.

P. 42

	PROCESS	MATERIAL	APPLICATION
1	PRIMER  FRESH DUSTING	EP MULTILAYER  QUARTZ 0,3-0,8	ROLLER
Very porous substrates may require additional consolidation layer prior to priming.			
2	BASE LAYER  FRESH DUSTING	EP MULTILAYER+ QUARTZ 0-0,5  PIGMENTED QUARTZ 0,3-0,8	TROWEL MIX: 1-1,5
After curing the layer, the surface must be sanded, sweep & vacuum clean the dust before applying finish layer			
3	FINISHING	EP MULTILAYER	RUBBER SQUEEGEE

There is the option of completing the system with a pigmented finish. In this case the aggregate used is colour free and the top coat will be pigmented EP MULTILAYER resin.



Residential parking

## SYSTEM

# EP MULTILAYER AQUA

### MULTILAYER SYSTEM MADE FROM WATER BASED EPOXY RESINS

System with excellent mechanical strength and high water vapour permeability indoor use. Especially designed for use in areas with residual moisture. There is the possibility of executing this floor with coloured quartz aggregate or colourless aggregate. In the second case, the final coating will be with pigmented resin to achieve a completely uniform colour finish.

	PROCESS	MATERIAL	APPLICATION
1	PRIMER	EP MULTILAYER AQUA+ QUARTZ 0-0,3	ROLLER MIX: 1-0,8
In very porous substrates may require an additional consolidation layer prior to priming.			
2	BASE LAYER  FRESH DUSTING	EP MULTILAYER AQUA + QUARTZ 0-0,3  QUARTZ 0,3-0,8	TROWEL MIX: 1-3
After curing, the surface of this layer must be sanded, sweep and vacuum the dust before applying the finish layer. To achieve thicker systems apply additional layers of the same type but apply by flat trowel.			
3	FINISHING	EP AQUACOAT	ROLLER

To get a smooth non-slip finish, we recommend sanding before applying the final top coat layer.



Warehouse in shopping area

## SYSTEM

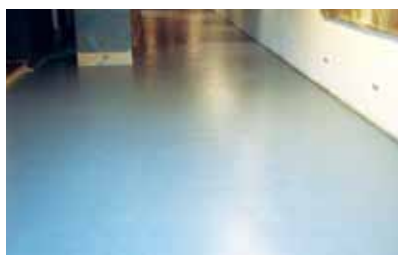
# KRYPTANATE MULTILAYER 100

## MULTILAYER SYSTEM BASED ON HYBRID UREA / URETHANE RESINS, ULTRA FAST DRYING

System with excellent mechanical and chemical resistance for use both indoors and outdoors. Ultra-fast drying, without solvents or strong odors.

P. 44

	PROCESS	MATERIAL	APPLICATION
1	PRIMER  FRESH DUSTING	KRYPTANATE 100  QUARTZ 0,3-0,8	ROLLER
Very porous substrates may require an additional consolidation layer prior to priming.			
2	BASE LAYER  FRESH DUSTING	KRYPTANATE 100 + QUARTZ 0-0,5  QUARTZ 0,3-0,8	TROWEL MIX: 1-1,5
After curing, the surface of this layer must be sanded. Sweep and vacuum the dust before applying finish layer.			
3	FINISHING	KRYPTANATE 100	RUBBER SQUEEGEE



Corridor in company



Kryptanate 100 sealing top coat



Common area in company



# SOME WORKS REALIZED WITH RAYSTON MULTILAYER SYSTEMS

## EP MULTILAYER

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P. 45

*Decorative detail*



*High traffic loading area*



*Storage area*



*Zone for pallet collection*



## EP MULTILAYER AQUA

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P. 46

*Fishing warehouse in Vilanova i la Geltrú (Barcelona, Spain)*



*Top coat application, coloured sealing*



*Industrial warehouse*

## KRYPTANATE 100

---



*Colourless sealing layer*



# 4

## BONDED SYSTEMS

FOR DECORATIVE PAVEMENTS, URBAN AND LANDSCAPE IMPROVEMENTS

### PAVISTONE & RUBBER BINDER

P. 47

The cold-bonded **Rayston systems** for continuous flooring based on decorative resin binding, minerals, various aggregates, grit or recycled rubber and EPDM.



*Bridge in Deltebre over the Ebro river (Spain)*

### A NEW APPROACH TO IMPROVE THE URBAN LANDSCAPE

The increasingly important growth of the urban population has resulted in population growth and a migration movement from the countryside to the cities. This has led to the development of urban centers, generating space limitations and critical problems related to urban life.

Urban centers should be developed to cope with their expansion and the influx of population, while maintaining a pleasant living space; because the health of the population depends on its cities.

Other important issues that cities have to consider are economic development, and urban tourism.

Since urban tourism is part of an overall strategy in the promotion of a city, tourism is characterized by business, leisure and events, it is necessary that visitors are attracted by both small villages and by large cities, where they can find rest and relaxation.

### ADVANTAGES

Decorative pavements based on Rayston resin and agglomerates provide the following benefits:

1. Urban development, to improve the living conditions of the residents.
2. They contribute to the city's economic development.
3. Giving a clean and safe area for pedestrians (fall protection).
4. Simple maintenance.
5. Areas can adapt barriers for blind or disabled.
6. They help create a more attractive city for tourists and offer elements of environmental quality in urban projects.
7. Ecological/water permeable systems to help save resources, contributing to drainage and rain-water recovery.

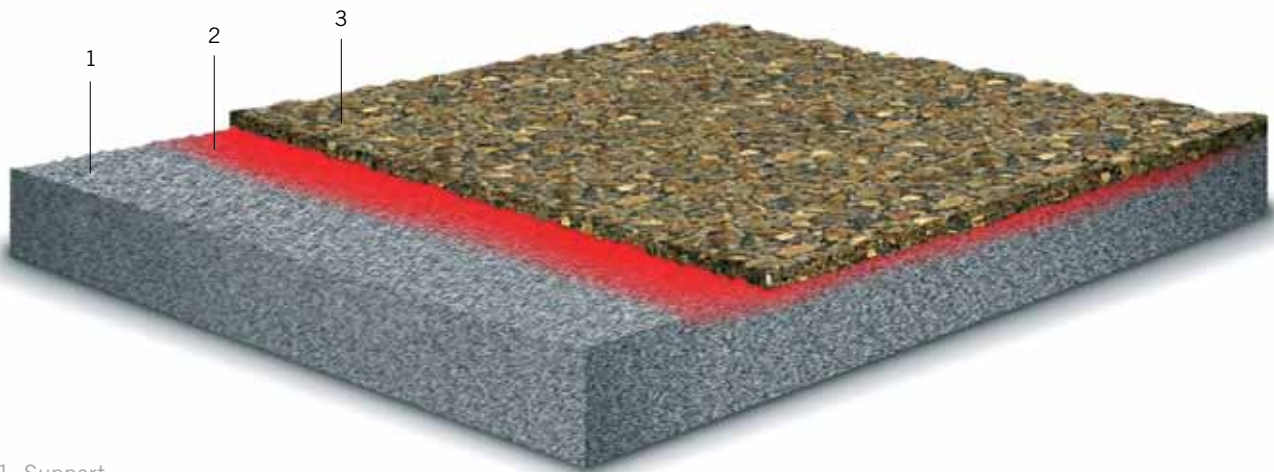
## SYSTEM

# PAVISTONE

### MINERAL FLOORING, DECORATIVE ANTISKID

PAVISTONE & PAVISTONE EPOXY Systems offer smooth, attractive, contemporary, hard, low maintenance, porous or semi-porous finish, depending on the type of natural aggregates used. The final surface is continuous amalgamated system which resists cracking.

P. 48



1. Support
2. Primer
3. PAVISTONE / PAVISTONE EPOXY



Aerial view of Villaviciosa Park (Madrid, Spain). Reproducing the geography of the area, through resin and aggregates.





*Paving around pool*

The choice of PAVISTONE system or PAVISTONE EPOXY will depend on the cost constraints, the size of the job and the desired final appearance.

## TABLE PRODUCTS/SOLUTIONS

PAVISTONE POLYURETHANE 1K/2K	PAVISTONE EPOXY
CRUSHED STONES	ROUND SHAPED STONES OR GRAVEL
BIG AREA WITHOUT JOINTS	SMALL AREAS: Tree pits... LARGE AREAS WITH JOINTS

P. 49

In both cases, the polyurethane and epoxy resins are cold applied, using the same application process.

The Wide range of colours and different designs available can unleash the imagination in the creation of paved surfaces.

PAVISTONE and EPOXY PAVISTONE Systems provide sustainable flooring and high drainage capacity, which can be combined with continuous membranes IMPERMAX / IMPERMAX 2K, etc. (*see the Rayston Liquid Water-proofing Systems Manual*) to channel rainwater for recovery and use as irrigation water in parks and gardens. Both systems require the use of dry & clean aggregate particles.

## GENERAL ASPECTS

Decorative pavements made from two component resins combined with aggregates of different nature and particle sizes.

Solvent free.

## APPLICATIONS

Garden areas

Tree pits

Areas of high friction

Path

Car parks

Bike paths

Fences

Ramps and access to housing

Pedestrian areas

Theme parks

Shops

Roads

Gateways

Housing developments

Offices

...



## 1. SUBSTRATE PREPARATION

The support must always meet the following characteristics (see section General-Application):

1. Clean, dry and free of laitance.
2. No dust or loose particles, and free of fats and oils.

In case of applying the system on asphalt, it must also be clean, dry and preferably prepared by milling / scarifying.

It is very important to have profiles, with which to develop an edge for the system, profiles can be constructed either with stones, brick, concrete or steel.

P. 50

## 2. PRIMER

As a general rule, when applied to substrate that meet the requirements mentioned in the previous section, the system does not require PAVISTONE specific primers.

On porous / absorbent support, apply a first coat of pure resin, as a primer.

## 3. BLENDING, MIXING AND POURING OF AGGREGATES

The PAVISTONE flooring system requires 2 basic elements: polyurethane / epoxy resin and aggregates.

The required quantity of resin will depend on the size and texture of aggregates.

The minimum thickness to be laid depends on the type of selected aggregate, and the intended use of the pavement. Please see the following table:

AGGREGATE SIZE IN THE MIX				APPLICATION	
1.5-3 mm.				2.5-5 mm.	6-10 mm.
THICKNESS OF THE FLOORING	12 mm.	16 mm.	22 mm.	Road / train (on concrete)	
	12 mm.	16 mm.	22 mm.	Road / train (on wood)	
		16 mm.	22 mm.	Rides Drainage paths	
	12 mm.	16 mm.	22 mm.	Rural paths	
	16 mm.	18 mm.	24 mm.	Urban paths	
	12 mm.	16 mm.	22 mm.	Vehicle traffic	
		18 mm.	24 mm.	Vehicle traffic (permeable)	
	15 mm.	18 mm.	24 mm.	Car Parks	

## CATALYST RATIO CHART FOR PAVISTONE

ENVIRONMENTAL CONDITIONS	DRYING TIME AS A FUNCTION OF CLIMATE AND AMOUNTS OF CALATYST		
	0.5% (A+B on weight)	1% (A+B on weight)	5% (A+B on weight)
Cold (0 a 3°C)	> 24 h	~ 24 h	~ 24 h
Temperate (20°C)	~ 24 h	~ 20 h	~ 5 h
Hot (40°C)	> 4 h	~ 2 h	~ 1 h

**IMPORTANT:** Pay special attention to the pot life of the mixed product. The critical situation appears in red (too short pot life). Orange and yellow situations are less critical. The catalyst is added to the resin (A component), mixed and then component B is added to the resin and mixed again.

## 4. APPLICATION PROCESS

The proportion of resin depends on the size and shape of aggregates. Testing is recommended prior to conducting works, to determine the correct ratio.

It is recommended to mix the two components (resin and aggregates) in a specialist kneading machine of sufficient power (BARON type M110, see [www.baron-mixer.com](http://www.baron-mixer.com)) always using the same period of time per mix so as to avoid different shades due to different mixing times.

The laying of the material is made by use of a flat metal trowel which allows a homogeneous and good compaction of the mixture. Minimise the open "fronts" to a maximum of about 3m.

An open front which is larger will cause a hardening of the material prior to pouring the next batch of mix, this will lead to more visible joints.

Day joints should be minimized, preferably leaving one per day. It is possible to reduce the amount of catalyst so as to increase the working time, and thus obtain better aesthetics

To obtain an aesthetically correct finish It is **very important** to visually check the applied areas from different angles, as it is difficult to appreciate (certain effects) and relief by viewing directly from above the material. Imperfections that are seen on the surface of the freshly laid product can be repaired without problems.

We must ensure that the work area is closed to the public until the material has hardened completely. Aggregates come in bags of 25 Kg and should be mixed randomly, avoiding the appearance of different colours in the work due to very slight differences in tone, this is especially important in case of large works.



1. Preparing the support



2. Mix the resin with aggregate



3. Pour the mixture



4. Spread the mixture



5. Level the mixture



6. Finished product

P. 51

## 5. FINISHING

In order to get a floor safe and anti-slip, it is recommended to sprinkle glass beads on the fresh pavement at an application rate of 50 a 80 gr./m<sup>2</sup>. Final layer of resin applied by roller.

## PERFORMANCES

The performance (life) of this type of pavement will depend on the load it is subjected to and the periodic maintenance conducted.

## ADVANTAGES

The use of PAVISTONE flooring systems has the following advantages:

### 1. Aesthetics.

The floor looks totally natural.

**2. Drainage.** PAVISTONE is fully permeable and allows rapid water evacuation. The system can even be combined with IMPERMAX\*, in order to facilitate management and re-use of water.

**3. Security.** Anti-slip surface can be obtained by the dusting of glass microspheres on top of the still wet surface. This encourages the use of the area for the handicapped and disabled.

\* Refer to Krypton Chemical Waterproofing Manual.



## SYSTEMS VARY ACCORDING TO THE APPLICATION / JOB TYPE

### SMALL WORKS AND BIG SURFACES WITH JOINTS

PAVISTONE EPOXY RAYSTON allows in small works to combine big size / round shape aggregates for decorative pavements and urban improvements such as tree pits.

#### TREE PITS AND DECORATIVES AREAS



P. 52

**Round shaped aggregates:** examples of colour



1. Special white



2. Red Alicante



3. Pink Valencia



4. Gray



5. Ivory Cream

### BIG WORKS WITHOUT JOINTS



#### DECORATIVE PAVEMENT AND LANDSCAPING

This type of crushed stones is more economic. For this reason, they are commonly used in big projects.

RAYSTON PAVISTONE POLYURETHANE RESIN can be combined with pigments to obtain different designs in an easy and economical way.



#### Crushed stone

Natural colour Silica / Tan, clean and dry

Particle size 0,2-0,8mm.

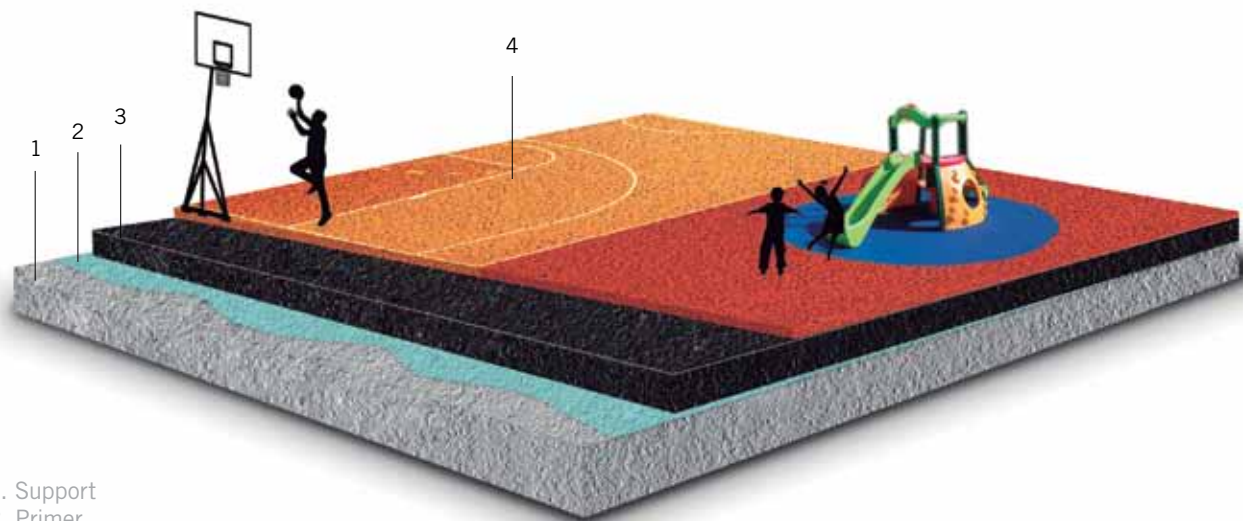


## SYSTEM

# RUBBER CRUMB BINDER

### DECORATIVE BOUND FLOORING MADE FROM RUBBER

RAYSTON RUBBER CRUMB BINDER allows to bind SBR (black) and EPDM particles of many diverse colours. Rubber crumb binder is a single component moisture cured polyurethane Resin, solvent free.



P. 53

1. Support
2. Primer
3. Rubber crumb (SBR)  
+ binder (30 mm. minimum)
4. EPDM in colours  
+ aliphatic binder (10 mm. minimum)

## Playground equipment and sports surfaces

Determination of the drop height varies according to UNE-EN 1177



Allows reuse of recycled tire rubber  
giving a new life to this waste

## APPLICATIONS

### Garden areas:

Tree pits

Walkways,...

### Decorative flooring:

Slopes

Terraces

Roundabouts

Decorative images, logos...

Zen gardens, other compositions...

### Safety Flooring:

Playgrounds

Recreational areas,...



Childrens' play area

P. 54

Rayston RUBBER crumb binder is available in, three grades depending on the performance requirements:

## AROMATIC RUBBER BINDER

Aromatic resin, ideal for use in application of continuous systems on-site. Is preferably used in the base layer.



## UV BINDER

Aromatic resin with special additives for better aging and reducing the "chalking" from exposure to UV rays.



## ALIPHATIC BINDER

Fully transparent UV stable resin, ideal for the top finishing EPDM layer.



## EXAMPLES OF COLOURS OF EPDM GRANULES FOR SYNTHETIC FLOORING

The following are approximate colours, there may be differences of tone between the image, the RAL number shown in the catalogue and the final product.



BEIGE  
RAL 1014



DARK  
BLUE  
RAL 5010



GREEN  
GLOSSY  
RAL 6017



YELLOW  
RAL 1002



RED  
RAL 3016



GREEN  
RAL 6021

## 1. SUBSTRATE PREPARATION

The surface to be covered must always meet the following characteristics in order to give a good bond:

1. Sound, clean, dry and free of loose or fragile particles
2. Free of fats or oils
3. No paint or other contaminants
4. Surface moisture should not exceed 4%
5. The surface temperature should be at least + 3° C above the dew point. (See page 13. Verification of dew point).

**NOTE:** do not EVER use resins to bind humid, wet or dirty elements



## 2. PRIMER

Keep in mind that each chosen primer, requires the adoption of specific measures in their allocation, implementation, number of layers, etc... including testing on the substrate in question, to ensure complete suitability.

It is possible that more than one coat of a primer is necessary to obtain complete homogeneity. This is dependant on the degree of absorption of the support.

## 3. APPLICATION

### FIRST LAYER: RECYCLED RUBBER

1. Mix the granules of rubber with RAYSTON RUBBER CRUMB BINDER in a suitable mixer.

2. Spread the first layer with a flat trowel. Ensure that the density is constant at the specified thickness. Minimum thickness of 30 mm.

3. Leave the **first layer** to cure (harden) so that foot traffic is possible. The cure time depends on temperature and humidity. Generally, curing takes place after 10-12 hours.

### SECOND LAYER COLOURED EPDM

4. Mix the granules with RAYSTON RUBBER CRUMB BINDER using a suitable mixer.

5. Spread the second layer with a flat trowel. It is very important for the stability, to ensure that this layer is homogeneous and well compressed with a minimum thickness of 10 mm.

6. Leave this second layer to cure (harden).

## LAYER THICKNESS

For economic reasons, installers use recycled rubber from tyres for the base layer. The layer of recycled rubber (SBR) must have a minimum thickness of 30 mm.

The minimum total system thickness is approx. SBR 30 mm plus coloured EPDM 10 mm.

The thickness can vary dependant on the value of HIC drop and the required stability of the system. A high HIC value can require the bottom layer to exceed 100 mm.

Consult the following European Standards:

- EN 1176: 1998 “Equipment play areas”.
- EN 1177: 1998 “Coating for playgrounds surfaces with impact absorption characteristics”.

P. 55



**NOTE:** The curing process depends on temperature and humidity. Do not allow foot traffic until the surface is sufficiently cured.



# SOME WORKS REALIZED WITH BONDED SYSTEMS

## PAVISTONE

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P. 56



*Residential housing entrance*



*Corridor in private house*



*Access and perimeter pool area*



*Swimming pool perimeter*



*Path access to housing*

### MÁLAGA OLYMPIC STADIUM

Training area for runners, with slopes (developed for the training of runners, submitted to a steeper slope than that of standard running tracks).



P. 57

### BRIDGE IN DELTEBRE (Spain) – Application of SBR and EPDM on asphalt.



### FOOTBRIDGE IN VALLADOLID (Spain)

In this application the bridge deck area has previously been waterproofed with system IMPERMAX Plus (see *Rayston Liquid Waterproofing Manual by Krypton Chemical*). The finishing layer has been dusted with dry aggregate, to anchor the EPDM system.





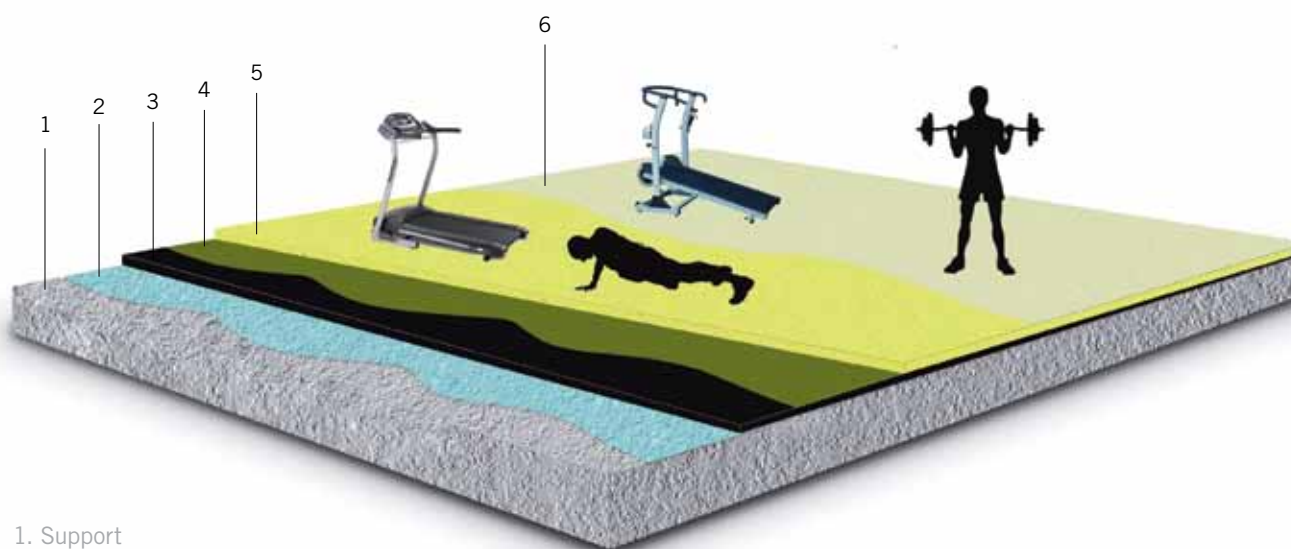
# 5

## COMFORT SYSTEMS

P. 58

### PAVIFLEX SPORT / PAVIFLEX SPORT PLUS Synthetic decorative flooring

RAYSTON cold applied Comfort Systems provide continuous, multipurpose sports flooring.



1. Support
2. Primer
3. Rubber Mat & Rubber Mat Plus
4. Porosity sealer with thickening additive
5. Paviflex
6. Finishing COLODUR ECO matt

### GENERAL ASPECTS

These systems are laid on any sound, dry and flat support, such as concrete or asphalt. Installation is also possible on existing "old" floors, constructed in wood, ceramic tiles, terrazzo or parquet.

The application on site of these comfort systems is completed without joints, thus ensuring a homogeneous coating over the entire surface.



## SUBSTRATE PREPARATION

The surface should always meet the following characteristics so as to achieve a good bond:

1. Be firm
2. Clean, dry and free of loose and fragile particles
3. Fat and oil free
4. Free of paint or other contaminants

## ADVANTAGES

- The rubber sheet has insulating properties, thermal and acoustic
- Comfortable to pedestrian traffic
- Shock absorbing, helps avoid strain injuries or falls
- Flooring is fully continuous, smooth, without joints or overlaps, ideal for maintaining a high standard of hygiene and cleanliness (nurseries, gymnasiums, etc...)

## APPLICATIONS

Hospitals

Colleges / Kindergartens

Commercial / Offices

Exhibition centres

Fitness / Sports flooring

Comfortable flooring in commercial centers where sales staff are usually standing up.

## APPLICATION

	PROCESS	PRODUCT	APPLICATION
1	PRIMER	On concrete: EPOXY 100 RAYSTON Two component epoxy resins, solvent free	ROLLER
If you propose to pause + 24 h between the primer and subsequent tasks, we recommend a light even (homogeneous) dusting of silica sand of size 0.2 to 0.4 mm on the wet primer .			
For primers on other media, consult the Technical Department of Krypton Chemical.			
2	ADHESIVE	PU RAYSTON Polyurethane Adhesive Two component solvent free	ROLLER
	SHEET ABSORBING	RUBBER MAT (1) OR RUBBER MAT PLUS (2)  Thickness 6 - 8 mm.	MANUAL PRESSURE ROLLER WEIGHT 50 Kg.



### RUBBER MAT (1)

Sheet manufactured from high quality recycled rubber pellets bonded with polyurethane resin. Shock absorbing base in sports flooring systems. Thanks to its robustness this system is especially recommended for multi-use sports halls and outdoor applications.



### RUBBER MAT PLUS (2)

Sheet manufactured from a special blend of foam rubber and recycled rubber tyres. Provides shock absorption without exceeding the maximum permissible deformation specified in the standard EN 14904.

Reduces injuries and wear in the joints of athletes, and is an exceptional underlying protection for schools and multipurpose recreational areas.

	PROCESS	PRODUCT	APPLICATION
3	PORE SEALING	<b>POROSITY SEALER THICKENING ADDITIVE</b> Two component flexible polyurethane resin, Solvent free	<b>FLAT TROWEL</b> Steel or rubber
This step seals and evens out the pores in the RUBBER MAT. This phase is critical to the final quality of the coating.			
4	POLYURETHANE COATING	<b>Pigmented PAVIFLEX</b> Two component self leveling polyurethane resin, Solvent free	<b>HAND SPREADER</b>
The self-leveling capacity of Paviflex allows a perfectly flat surface.			
5	FINISHING & TOP COAT	<b>COLODUR ECO pigmented matt</b> Two component flexible polyurethane resin Solvent free	<b>SHORT FIBER ROLLER</b>
The final layer is applied with a roller. The matt finish provides visual comfort for players and causes no annoying brightness, even in the playing fields. <i>Check this products' certifications on p. 9</i>			

P. 60

## APPLICATION PROCESS



Preparation of rubber mat



1. Application of primer



2. Application of adhesive



3. Rubber mat with porosity sealer



4. Self-leveling resin Paviflex



5. Finished floor

# SOME WORKS REALIZED WITH RAYSTON COMFORT SYSTEM

## PAVIFLEX SPORT

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P. 61

*Fitness hall in Italy*



*Fitness equipment area in gym*



# INNOVATION

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P. 62

## ANTIBACTERIAL RAYSTON SYSTEM

sanitary flooring for health, food, and pharmaceutical industries...

Increasingly, floor surfaces are required to be easy to clean, particularly in areas where you need to maintain high hygiene and strict safety standards. These floors may be specified with anti-bacterial properties to minimize spread of germs.

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### HEALTH REQUIREMENTS OF A FLOOR

- Reduce and minimize the risk of contamination.
- Prevent bacterial growth on the floor.
- Easy to clean and totally continuous (without joints, overlaps or other elements that facilitate the retention of contamination or dirt).

### APPLICATIONS

- Health department flooring
- Hospitals
- Clinics
- Health centers
- Laboratories
- Kindergartens
- Pubs and restaurants
- Industries
- Food industry
- Pharmaceutical
- Wineries
- ...

### ADVANTAGES

1. The Rayston Flooring Systems continuous surface without joints gives great advantages in terms of hygiene, cleanliness and appearance.
  2. Reduces and minimizes bacterial growth.
  3. Allows refurbishment of old pavements into new antibacterial flooring.
  4. This system can be obtained at low cost for refurbishment and conversion into a hygienic floor.
  5. Available in a variety of colours, textures
  6. It is possible to obtain either hard flooring, with high resistance to compression, or elastic, resilient and comfortable flooring.
  7. Ease of maintenance and cleaning.
-





*Dining room in geriatric residence*



*Flooring at hospital*



# MAINTENANCE REPAIRS

P. 64



Maintenance begins after completion of the work and should include regular monitoring visits

## MAINTENANCE

**Some kind of maintenance must be done for all floors dependant on their use.**

This maintenance will include the following:

- Periodic cleaning of the pavement. Neutral detergent to be used or enzymatic (PH neutral / non-corrosive), so as not to effect the characteristics of the pavement.
- Verification of maintainance of different structures, joints, treatments on up stands...
- It is possible to use protective waxes for floors (RAYSTON WAX). In such cases, it is important to follow the instruction for each specific wax (cleaning and removal...).
- Prompt removal of spillages or potential contaminants.
- Verification of any cracks that may be caused by inappropriate use.

For decorative uses it will be necessary to apply additional layers of top coats depending on their use: wear, traffic, exposure to chemicals...

## REPAIRS

**In all cases, the repair must be performed on clean, dry media.**

**All areas where resin has lifted up or become loose must be eliminated.**

### SURFACE

If the superficial damage is due to wear or degradation. Proceed by sanding the surface, thoroughly vacuum clean and then apply a new coat.

The selection of this new repair layer depends on the initial system installed and the final characteristics required, i.e. in exactly the same way as was considered at the time of initial application of the flooring.

### SIGNIFICANT DAMAGE

If damage is significant the first point to research is how the floor was damaged. Once the cause is identified and rectified the floor can be re-laid with appropriate guarantees.

Precise repair systems vary depending on the system that already existed and the reasons for the damage.

# CAUSES, REMEDIES

Continuous flooring systems can suffer various problems due to misapplication, improper support, adverse weather conditions...

Below we describe the most common causes, and the possible solutions.

## RUNS / SAGGING

### CAUSES

- In thick layer self-leveling systems, sagging may occur in sloping areas.

### REMEDIES

- Sand /abrade the drips/runs and repeat these layers. For the remaining floor reduce the depth of the self-leveling layer and multilayer systems or add a thickener to prevent resin flow.

## BUBBLES / BLISTERS

### CAUSES

- Application on a hot substrate.
- Application on a support not completely sealed / primed.
- No use of spiked roller for thick layer systems.
- If the curing time is not respected when laying products based on different technologies, this may result in blisters (water, solvent pushing up).

The application of polyurethane resins on substrates containing moisture, can cause blisters due to the negative pressure generated.

### REMEDIES

- Cutting, sanding and filling with PU sealant before continuing. Bubbles in thin film systems will not need filling up.

## LACK OF ADHESION

### CAUSES

- **Installers applying** on moist supports must respect the maximum substrate moisture content.
- **Environmental conditions.** Especially in water-based systems, there must be good ventilation of the work area because this affects the cure time. Application should never be done in levels of relative air humidity greater than 85%.
- **Inadequate surface preparation.** Lack of adhesion with the support may be caused by the lack of adequate preparation of the base, contamination, porosity, roughness...

### REMEDIES

- Amend the moisture content of the substrate and the air by forcing ventilation and then conduct specific tests.
- Correct preparation of the base and reapply the coating.

# COMPLEMENTARY PRODUCTS

P. 66

## SEALANT RAYSTON FLEX 3000

One component polyurethane low modulus sealant, which is intended to fill expansion joints and cracks, also used as a flexible adhesive.

### Used for:

- Waterproofing interior and exterior masonry, expansion joints, carpentry, etc.
- Expansion joints for the construction industry.
- Caulking joints in precast lightweight, heavy duty, and traditional masonry.
- Adheres to aluminum, glass, masonry, wood, etc.



## BUTYL TEX

Cold applied self-adhesive strip comprising a viscoelastic butyl layer bonded to a non-woven geotextile. This lining fabric allows movements in the cross direction and limits deformation in the longitudinal direction. Used for covering joints and edges in up stands before laying liquid solutions (resins or cement).

Its flexibility allows it to adapt to the shape of the support prior to the subsequent application of self-levelling systems (**Pavifloor / Aquanivel EP / EP Level / Paviflex**) Multilayer Systems (**Multilayer EP / EP Multilayer Aqua / Kryptanate Multilayer 100**). Also used to seal removable gaskets and drains.



## SEAL BOTTOM RAYFOND RAYSTON

RAYFOND is a cord / bar made from closed cell polyethylene foam. It serves as a tool/packer to limit the depth in vertical / horizontal joints that must be subsequently filled and sealed.

We recommend using this product on joints that are to be subsequently sealed, in roofing decks, floors, walls, and prefabricated panels.



## TOOLS

A range of professional tools designed for applying polyurethane and epoxy resins for all Rayston flooring systems.



## RAYSTON FIBER 200 FIBER NET

Material made from glass filaments distributed randomly to form a regular mat. The threads are bound with a binder emulsion.

**Fiber net:** woven square grid with integral strength, ideal for working on tiled substrates.

- Attached to the support (or not), then saturated with Epoxy resin 100 + aggregates

Optimum compatibility with all types of resins. Good workability and increases the mechanical properties of the final product.



## RAYSTON SOLVENT

Mixture of solvents 100% compatible with the products used for the manufacture of solvent based Rayston products, and useful for adjusting the products viscosity, and for the cleaning of tools.

## NATURAL QUARTZ OR COLOURED CORUNDUM

### GLASS BEADS

Depending on the specified slip resistance on the finished surface (wet or dry), our systems can meet all your needs in relation to the standard XP P 05-011.

Typical areas are private or public swimming pools, restaurants, terraces, stairs, etc.



## RAYSTON WAX

Protective resin based wax finish. Protects the floor against scratching and initial wearing, whilst the pavement is reaching its final mechanical properties. Resists premature stains, permits assembly and installation of furniture possible within a few hours of the application of the floor.

## DECORATIVES FLAKES

For creation of floors with various decorative designs and patterns. Different sizes and colours can be intermixed.



## PIGMENTS PASTES

Paste based pigments in specific RAL colours are available for combining with Rayston Flooring Systems to fit the desired scheme design.





P. 68

## The Technical Department of Krypton accompanies you on all your projects

Whatever your floor construction needs, be they new installation or refurbishment, **Krypton Chemical** makes available to its customers a wide range of systems and services.

To assist with new installation and refurbishment projects **Krypton Chemical** collaborates with technicians, installers, architects maintenance managers, etc. We attend the site to inspect and detect if possible in-situ conditions may affect the pavement.

After this initial visit we proceed to prepare a report and prescribe the Rayston systems' technical solution, and identify/diagnose issues within the substrate to enable the recommendation of the best solution adapted to the needs of the project.

During the project implementation, the technical sales department of **Krypton Chemical** will support and monitor the installation and provide advice and solutions to any problems.





## Quality Control & Technical Assistance

Krypton Chemical works in the flooring industry as a total supplier, we monitor projects and play a decisive role in each of their phases:

### **PROJECT DESIGN**

Our systems are certified and approved by different laboratories. Our involvement commences with visits to the site in question to determine the most appropriate system for the client's requirements; we identify the tasks necessary for support preparation and conditioning.

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### **DURING THE EXECUTION OF THE WORK,**

the Technical Department of Krypton Chemicals makes regular visits to certify that the standard of work complies to the specification of each project and the quality requirements of each system.

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### **DELIVERY OF THE WORK,**

the company extends a certificate to the client, ensuring the integrity of the system applied, and its durability over time. For works that require it, the company can also certify compliance with applicable standards and quality systems, these are done by external laboratories specialising in this type of application.

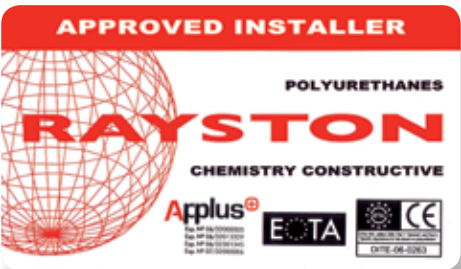


P. 70

# Technical Conference and Training by Krypton Chemical

**Krypton Chemical** regularly organizes Technical Seminars and Training so that its approved installers acquire the knowledge and skills necessary to implement the different systems with the necessary guarantees.

The participating companies are issued with the corresponding certificate and card as a RAYSTON Approved Applicator.



# CONCLUSIONS

## Krypton Chemical with you in your projects

P. 71

RAYSTON flooring systems **provide a number of solutions and possibilities in modern constructions and refurbishments.**

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Most Rayston flooring products are certified by the most recognised laboratories and test centres. **Rayston Systems** are applied by company approved installers.

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These systems are for both new construction projects and refurbishments. They are backed by the **experience gained during more than 13 years of research** and development and experience of installations in countries in the five continents.

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Advances and developments in the field of polymer chemistry, allow us to provide an **increasing range of possibilities** in developing **stronger buildings, making them safe, liveable and sustainable.**

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Krypton Chemical is firmly committed to product **innovation** and provides solutions for each project based on the needs and idiosyncrasies of each project, both in conception, design and during implementation.

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We invite you to join us in this exciting field and enter the wide world of possibilities offered by modern technology in flooring.

## **RAYSTON 2013**

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