PRESCRIPTION REPORT

Report prepared for:
CLIENT

CLIENT XX

0088
Industrial Flooring

Report Nº: 05102022

XX Ltd. New Portlaoise Site

Report N°
05102022

JUNO PAINTS IRELAND LTD.
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INTRODUCTION

The objective of this report is to provide technical solutions to the requirement of supplying high quality exterior finishes in line with the most stringent and latest European standards to XX's new warehouse floor as per JUNO's recommended high quality finishes and application. Factors influencing the selection of a flooring system should include amongst others:

- Type And Degree Of Traffic
- Temperatures To Which Flooring Will Be Exposed
- Nature And Duration Of Any Chemical Contact With The Floor
- Texture Of Surface Expected
- Wet Or Dry Conditions
- Slip Resistance Requirements
- Nature Of Light Exposure
- Aesthetic Appearance
- Crack Bridging Capability
- Ease Of Cleaning (Including Hygiene Requirements)
- Site Conditions At Time Of Installation
- Cost

The most appropriate flooring for any situation will depend upon the particular conditions to which it will be subjected, and the choice should be made in discussions between all the interested parties, including client, contractor and supplier.

This report is made to determine the necessary treatments to be executed and offering a painting system according to specification needs in line with JUNO's experience supplying continuous epoxy coating systems to industrial floor facilities of this type.

As a reference manufacturer in the sector since 1927, JUNO operates a quality control system in accordance with the principles of *EN ISO 9001 and *EN ISO 14001, verified by an approved third party certification body, at each facility where products covered by this specification are produced.

*ISO 9001: 2008 quality assurance standards in the design, development, production, installation, and after-sales service.
*ISO 14001: 2004 environmental management processes regulating activities reducing the environmental impact of our activity.

Products Certified by independent laboratories

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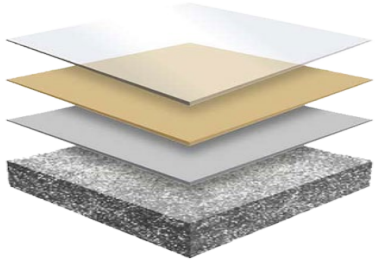
SPECIFICATION STANDARDS

JUNO's proposed products for this project are certified for the following standards relevant to synthetic resin flooring;



- Determination of permeability to carbon dioxide **UNE-EN 1062-6:2003**
- Determination of permeability to water vapour. Capsule method. **UNE-EN ISO 7783:2019**
- Determination of permeability to liquid water **UNE-EN 1062-3: 2008**
- Determination of adhesion by direct traction **UNE-EN 1542:2000**
- Resistance to strong chemical attacks **UNE-EN 13529:2005**
- Determination of resistance to abrasion. Taber abrasion test apparatus. **UNE-EN ISO 5470-1:2017**
- Rapid deformation tests (impact resistance). Rapid-deformation (impact resistance) tests - Part 1: Falling-weight test, large-area indenter
- Material testing methods for continuous screeds. Determination of resistance to bending and compression. **UNE-EN 13892-2:2003**
- Fire resistant Fireproof **Euroclass B-S1, d0**
- CE certified

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SYSTEM CONSIDERATIONS

Consideration should be given to client requirements of whichever of the following are applicable:

- Intended use of the synthetic resin flooring including the type, extent and frequency of trafficking.
- Type of loading, static or dynamic, and severity of impact.
- Details of all chemicals, including those used for cleaning or sterilizing, which could come into contact with the floor, and extent, frequency and temperature of spillage.
- Temperatures that the flooring is required to withstand in normal service or as part of the cleaning operations and whether exposure is by radiant or conductive heat or by direct contact.
- Colour, uniformity and retention, aesthetics, and decorative effects.
- Extent to which the flooring will be exposed to direct sunlight or ultra-violet light.
- Compliance with hygiene or food industry requirements.
- Special requirements, such as slip resistance or anti-static characteristics.
- Expected life of the flooring.
- Thickness of flooring to be installed.
- Time available for the application and curing of the flooring.
- Age, specification where known and nature of the base, including information about any previous use of the floor which could affect adhesion, and any preparatory treatment required.
- Health & safety and environmental issues during application and in service.

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XX LTD – NEW WAREHOUSE FLOOR OBSERVATIONS

The floor in question is a newly laid unused floor slab.
First observation is that the concrete layer is fibre reinforced. The fibres are embedded in the cement matrix, and are visible on the surface in some areas.
The fibre type used is synthetic micro fibres.

Site readings carried out on 04/10/2022 have given the following readings;

- **Moisture content – between 5.1% and 6.5% as measured with a Tramex Moisture Meter**
- **Substrate temperature: 13°C**
- **Dew Point: 13°C**

As the floor stands, current site conditions are not conducive to application of flooring system, unless special DPM primer is utilized beforehand.

Function/Use of the Alphadrives floor Slab

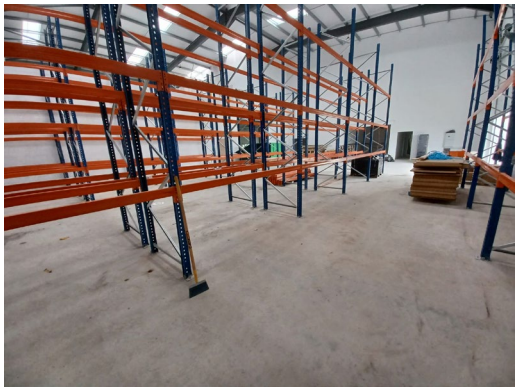
As indicated, most of the floor loadings will be static load, with some degree of dynamic loadings. The static floor load will be from the storage racking recently installed.
Dynamic loads will be in the form of typical vehicle operating "at floor level" such as a pallet transporter or forklifts, carrying small loads (>3 tons).

SITE IMAGES

Images from worksite





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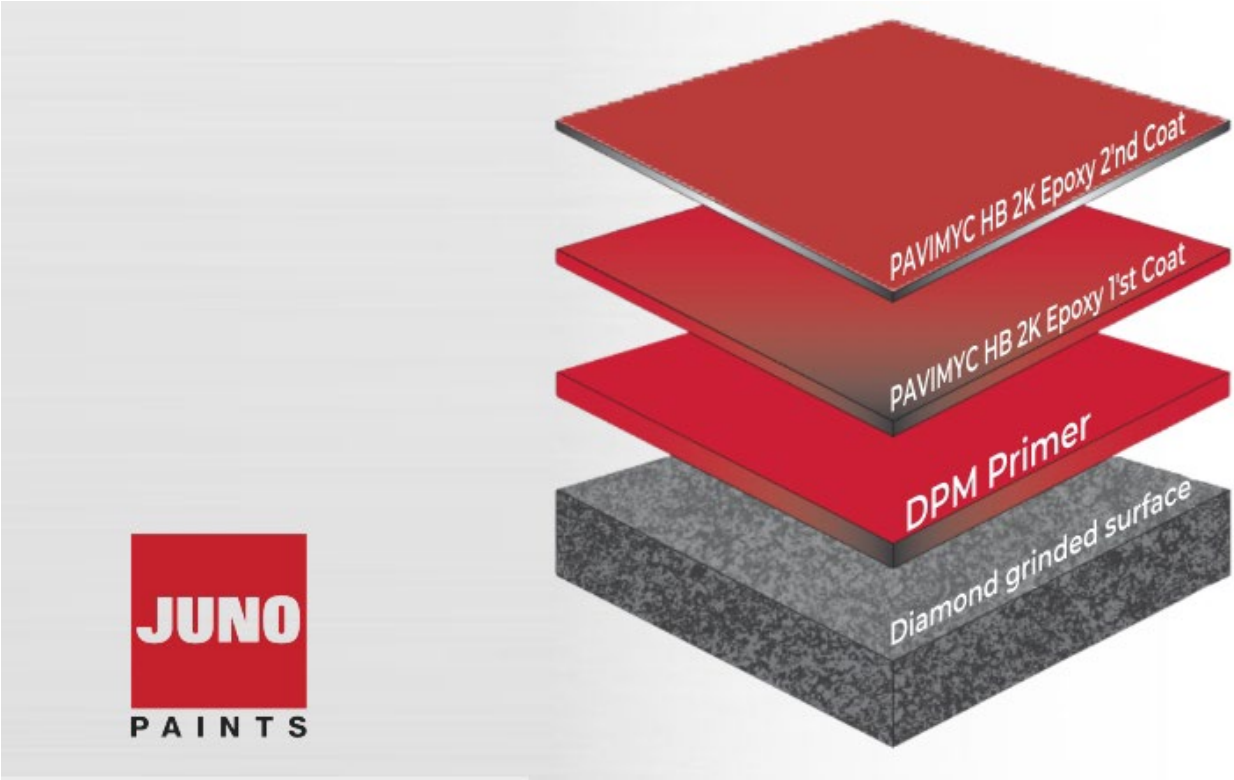
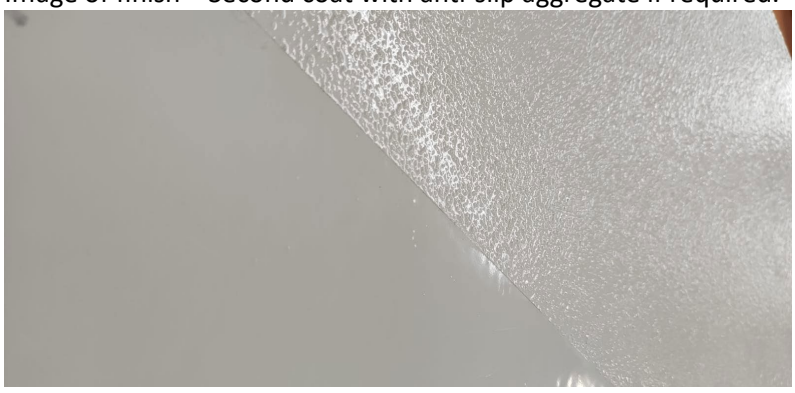
JUNO PAINTS - FLOOR SYSTEM PROPOSAL #1



SMOOTH SYSTEM FINISH (Optional anti-slip aggregate in 2'nd coat)	**PRODUCT**	**CONSUMPTION**
DPM PRIMER	1 COAT OF ARDEX DPM 1C PRIMER	±0,55 Kg/m²
TOPCOAT	FIRST COAT PAVIMYC HB 2/C (Prod. Code 07930)	±0.45kg/ m² for 2 coats – Roller applied
TOPCOAT	SECOND COAT PAVIMYC HB 2/C (Prod. Code 07930) (Optional anti-slip beads mixed into second coat if required)	

Image of finish – Second coat with anti-slip aggregate if required.



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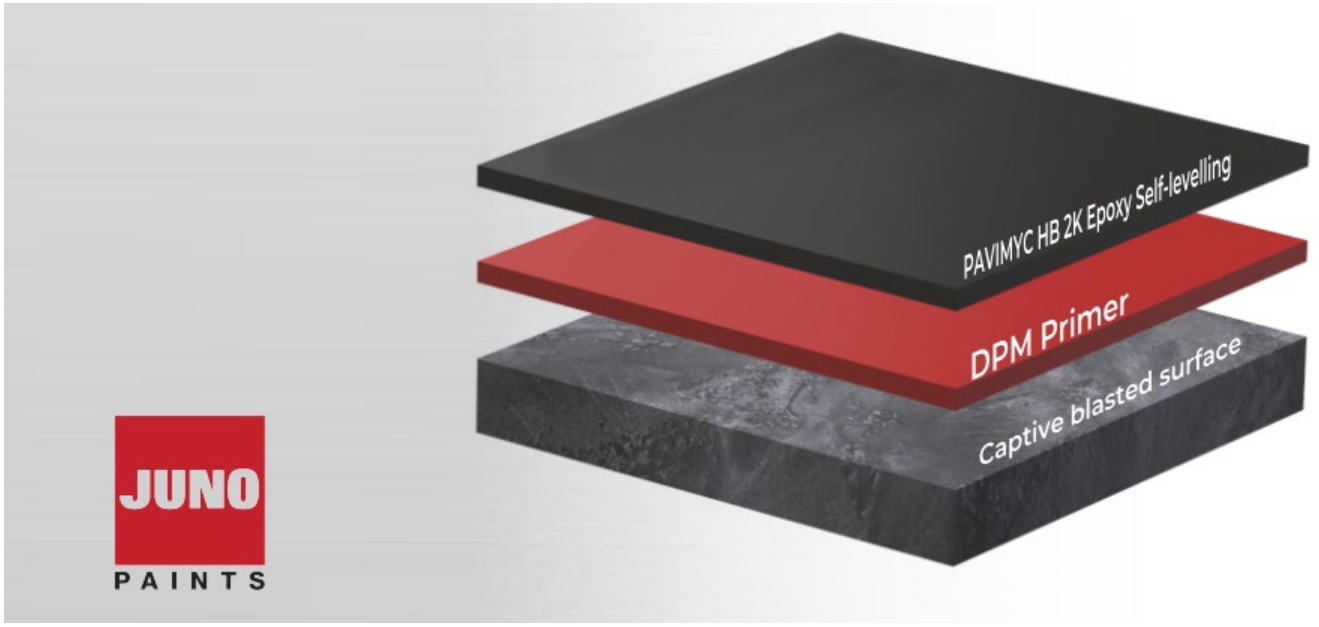
JUNO PAINTS - FLOOR SYSTEM PROPOSAL #2



SELF-LEVELING SYSTEM	PRODUCT	CONSUMPTION
DPM PRIMER	1 COAT OF ARDEX DPM 1C PRIMER	0,55 Kg/m²
TOPCOAT - SMOOTH SELF LEVELLING FINISH	1 part Pavimyc HB 2/C (Prod. Code 07930) +0.5 part sand aggregate 0-1-0.3 mm	1.69 kg/m2 mixture (1.12 kg/m2of Pavimyc HB 2/C + 0.57 Kg/m2 of sand aggregate)

Image of finish – Primer + Self-Leveling finish (1mm)

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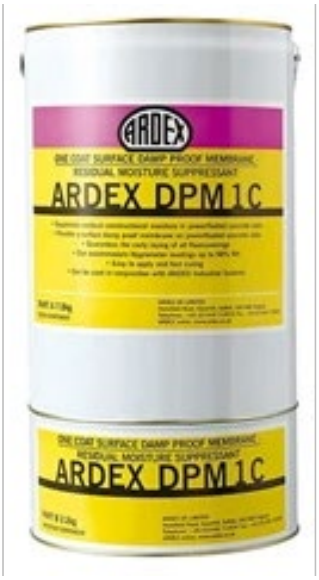
DAMP PROOF MEMBRANE PRIMER

FLOOR COATING: Treatment
PRODUCT: ARDEX DPM 1C

One Coat Surface Damp Proof Membrane



One-coat damp proof membrane and residual moisture suppressant. Protects the final floor covering from residual construction moisture and rising damp. Can be applied where a structural damp proof membrane is not present or is ineffective.

Features:

Suitable for use on surfaces with the highest measurable levels of moisture content (up to 98% RH).
Adheres to saturated concrete even at lower temperatures.
Can receive Smoothing and Levelling Compounds in as little as 6 hours.
Suitable for use on cement/sand screeds containing water based under floor heating systems.

- **Adhesive Bond:** ≥ 2.0 MPa
- **Application:**https://ardex.co.uk/wp-content/uploads/2018/03/ARDEX-DPM-1-C-1.pdf
- **Carbon Dioxide Permeability:** Sd >50 m
- **Composition:** Two component epoxy resin and catalyst hardener
- **Coverage:** 10.8 m² per 6 kg unit (minimum), 62.5 m² per 25 kg unit (maximum), dependant on relative humidity % RH
- **Drying Time:** 6 hours
- **Primer:** One coat damp proof membrane and residual moisture suppressant
- **Water Vapour Transmission:** Class II

APPLICATION OF DAMP PROOF MEMBRANE

ARDEX DPM 1C
For this project we recommend the application of minimum 0.55 KG/M2. Follow instructions as per technical datasheet. (https://ardex.co.uk/wp-content/uploads/2018/03/ARDEX-DPM-1-C-2.pdf)

100% SOLID CONTENT EPOXY PRIMER

FLOOR COATING: Primer

PRODUCT: PAVIMYC HB 2K EPOXY PRIMER

High solids 2K primer formulated based on modified epoxy resins.

High solids primer formulated based on modified epoxy resins. The PAVIMYC HB 2/C PRIMER combined with the PAVIMYC HB 2/C (07930) allows different systems for continuous coatings to be achieved with a single product (smooth, non-slip, multilayer or self-levelling finish systems).

PAVIMYC HB 2/C PRIMER is recommended as;
-Primer for cementitious or concrete surfaces
-Primer for Pavimyc HB 2/C systems.

APPLICATION OF PRIMER

SURFACE PREPARATION

CEMENTITIOUS AND CONCRETE SURFACES

- As a general rule, surfaces must be firm, dry and clean with a minimum tensile strength of 15 kg/cm² and a compressive strength greater than 25 N/mm².
- Substrate humidity level must always be less than 4% measured at 2 cm depth before application.
- Eliminate grease and rubber stains by means of a suitable mechanical process (blasting, milling or diamond grinding).
- If it is not removed, consult the technical department.
- Laitance and curing agents must be removed by means of a suitable mechanical process (blasting, milling or diamond grinding), subsequently vacuuming the resulting dust, to obtain a rough surface free from foreign materials.
- It is advisable to apply a preliminary test patch in a representative area (1 m²) to ensure product suitability.

APPLICATION TIPS

- Stir products until completely homogenized.
- Apply on consistent, clean, dust-free surfaces, free from efflorescence (saltpetre) and mould.
- Dilute a maximum 3% with D-90 (Cod. 50.010) for sealing systems. In the rest of application systems do not dilute.
- Environmental conditions · During the application and curing process the temperature must be kept
- above 10°C and below 30°C.
- Relative humidity should not exceed 75%.
- There should be no rising damp or surface moisture greater than 4%.
- The temperature of the substrate must be at least 3 °C above the dew point.
- Avoid condensation.
- Do not apply with risk of rain or strong wind.

100% SOLID CONTENT EPOXY
FLOOR COATING: TOPCOAT
PRODUCT: PAVIMYC HB 2K EPOXY
100% solids epoxy coating formulated with epoxy resins and pigments providing high chemical resistance and durability.

PAVIMYC HB 2/C is a 100% solids epoxy coating formulated based on modified epoxy resins. Allows for multiple systems of continuous coatings to be achieved with one single product. (Smooth, non-slip, multilayer or self-levelling systems).

PAVIMYC HB 2/C is recommended as;
- Smooth or non-slip sealing layer on concrete and other cement based substrates.
- Intermediate coating in self-leveling floor systems

APPLICATION OF PRIMER

SURFACE PREPARATION

CEMENTITIOUS AND CONCRETE SURFACES

- As a general rule, surfaces must be firm, dry and clean with a minimum tensile strength of 15 kg/cm² and a compressive strength greater than 25 N/mm².
- Substrate humidity level must always be less than 4% measured at 2 cm depth before application.
- Eliminate grease and rubber stains by means of a suitable mechanical process (blasting, milling or diamond grinding).
- If it is not removed, consult the technical department.
- Laitance and curing agents must be removed by means of a suitable mechanical process (blasting, milling or diamond grinding), subsequently vacuuming the resulting dust, to obtain a rough surface free from foreign materials.
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SUPPLIED MATERIALS

The supplied paint system comprises of three basic ingredients: the base resin, a reactive hardener and particulate filler wherever this is required. The products will be supplied as these three separate components.

If specified, surface dressings or coarse aggregate may also be supplied separately.

ARDEX DPM PRIMER
Component A 7,8 Kg.
Component B 2,2 Kg.
Component A+B: 10 Kg.

PAVIMYC HB EPOXY COATING
Component A: 15,2 Kg.
Component B: 4,8 Kg.
Component A+B: 20 Kg.

For all synthetic resin flooring products the setting reaction, by which the initially liquid components are converted into a strong tough polymer, begins only when the base resin and the reactive hardener are intimately mixed. To obtain the optimum results these components must be blended in the prescribed proportions needed for the chemical reaction to occur and mixing must be thorough to ensure the final product is homogeneous and uniform.

The base resin and the reactive hardener will generally both be liquids.
The individual components may comprise blends of different resins, hardeners, catalysts, and other modifiers. However the make up of such components under site conditions is not permitted because the necessary levels of precision and quality control are unlikely to be achieved consistently.
These base resins and reactive hardeners are therefore always supplied by JUNO pre-formulated to facilitate site operation.

For most applications the flooring product will be supplied in matched pre-weighed packs of the components so that no measuring out on site is necessary. No attempt should be made to sub-divide such packs because of the difficulties involved in ensuring correct proportioning.

In some situations it may be feasible for any of the components to be supplied in bulk and then batched on site provided a level of quality control can be assured. Particular care will be needed if the liquid resin components contain dispersed filler or pigment to ensure that the quantities dispensed are uniform in composition as any separation would lead to variations in colour or mechanical properties.

GENERAL SYNTHETIC RESIN FLOORING SPECIFICATION

This Specification covers the performance, design and installation of flow-applied or trowel-finished synthetic resin (PC) floorings directly bonded to the substrate, for industrial, commercial or domestic use.
Synthetic resin floorings can be divided into different types varying in thickness and surface finish, as described in Table 1.

Table 1: Types of Synthetic resin flooring

Type	Name	Typical thickness	Description
1	Floor seal	dry film thickness up to 150 µm	applied in 2 or more coats: generally solvent or water borne.
2	Floor coating	final thickness of 150-300 µm	applied in 2 or more coats: generally solvent-free but may be solvent- or water-borne.
3	High build floor coating	final thickness of 300-2000 µm	applied in 2 or more coats: generally solvent-free.
4	Multi-layer flooring	1 mm +	multiple layers of floor coatings or flow-applied floorings with aggregate dressing: often described as 'sandwich' systems.
5	Flow applied flooring	2 to 3 mm	Often referred to as 'self-smoothing' or 'self-levelling' flooring, and having a smooth surface: or may be given a surface dressing.
6	Screed flooring	4 mm +	heavily filled, trowel-finished systems, generally incorporating a surface seal coat to minimise porosity.
7	Heavy duty flowable flooring	4 to 6 mm	aggregate-filled system, having a smooth surface: or may be given a surface dressing.
8	Heavy duty screed flooring	6 mm +	trowel-finished, aggregate-filled, system which is effectively impervious throughout its thickness.

Factors influencing the selection of a flooring system should include amongst others:

- Type and degree of traffic
- Temperatures to which flooring will be exposed
- Nature and duration of any chemical contact with the floor
- Texture of surface expected
- Wet or dry conditions
- Slip resistance requirements
- Nature of light exposure
- Aesthetic appearance
- Crack bridging capability
- Ease of cleaning (including hygiene requirements)
- Site conditions at time of installation
- Cost

The most appropriate flooring for any situation will depend upon the particular conditions to which it will be subjected, and the choice should be made in discussions between all the interested parties, including client, designer, contractor and supplier. It is not possible to provide a simple guide as to where to use different flooring types, since so many parameters can affect the decision for a particular situation.

Surface smoothness and slip resistance

The flooring shall be finished in a manner that produces reasonable slip resistance appropriate for the circumstances of use.
As a general rule, the smoother and less porous a floor surface, the easier it is to keep clean. However, whilst these specialist floorings can be formulated to produce smooth, non-porous surfaces with excellent slip resistance under dry conditions, the surface has to be textured if it is to have adequate slip resistance under wet conditions. Such texturing can be achieved by selective grading of the larger aggregate particles in the flooring composition, or by a surface scatter of special polish-resistant aggregate into the surface of the flooring composition whilst it is still mobile.

The heavier the likely build-up of contaminants, the coarser the surface texture has to be to retain the required level of slip resistance. However coarse textured surfaces are more difficult to clean, so where both slip resistance and ease of cleaning are important, a compromise must be made.
Flooring should be selected with sufficient texture to suit specific working conditions and hygiene standards, and the frequency and type of cleaning must be organized to retain these properties.

In areas where the floor will be frequently wet during service, the slip resistance value (SRV) of the flooring should preferably be not less than 40 in the wet state, except for situations where ease of cleaning is more critical than slip resistance and/or where all who use or are likely to use the floor will wear specially provided slip resistant boots or shoes. In these circumstances, a slip resistance value in the wet of not less than 33 may be acceptable.

Chemical resistance

Well formulated and correctly applied synthetic resin floorings have proved an effective method of protecting concrete substrates sensitive to attack from aggressive spillages. Whilst no floor finish is

completely resistant to prolonged contact with high concentrations of all possible chemical types and combinations, selected synthetic resin floorings are resistant to many of the chemicals and products found in normal industrial service situations. In practice prolonged contact with large quantities of the most aggressive chemicals is unlikely because of the health hazard likely to be involved.

By attention to floor design, e.g. provision of adequate drainage and maintenance of good housekeeping standards, excellent service life can be achieved under conditions of aggressive chemical spillage.
Because of the wide variety of chemical products used in industry and the diversity of floorings it is not practicable to provide a simple guide to chemical resistance and the advice should be sought of the manufacturer based on his experience in similar locations and on laboratory testing of the product.

Resistance to particular chemicals does not exclude the possibility of surface staining. Some chemicals may cause discoloration of the flooring surface without affecting the service integrity and durability of the flooring material. It is therefore essential that the user should establish whether the proposed flooring product will be resistant to staining as well as chemical attack in the particular environment, especially when aesthetic appearance is a major requirement.

The manufacturer or contractor in deciding which product to recommend for a particular situation will require information on:

- Chemical constituents and concentration of likely spillage
- Temperature of the spillage
- Quantity and frequency of the spillage
- Presence of water and procedures for emergency wash-down
- Regular cleaning procedures
- Chemical composition of cleaning or sterilizing agents
- Falls, drainage and sumps (waste collection tanks) to be provided

Temperature resistance

Most synthetic resin floorings have relatively low Heat Distortion Temperatures (HDT), generally between 50 and 80°C, much lower than ceramic tiles or concrete screeds. In practice certain synthetic resin floorings have proved capable of withstanding higher temperatures than their HDT through attention to formulation, application and floor design. Those systems which have been found satisfactory against steam cleaning, for example, combine a higher HDT with a lower elastic modulus and a higher design thickness in order to give improved thermal shock resistance.

The resistance of a synthetic resin floor to heat will depend on a number of factors:

A) Nature And Type Of Heat Source.

Due to the low heat capacity of air and the relatively slow changes in temperature caused by convected and radiant heat, dry heat is normally only a problem in extreme conditions, eg close to oven doors.

Liquids in contact with floors give a much higher heat transfer and therefore pose more of a risk. Particular care should be taken in the design of the flooring where extreme temperature variations are likely, such as in cold stores and areas around ovens or furnaces. The movement of these areas in relation to the surrounding floor must be carefully considered and appropriate joints installed.

Where direct radiant heat is anticipated such as the surrounds to oven doors it may be necessary to install a more heat resistant flooring such as ceramic tiling in the immediate vicinity but again the need for a movement joint between such an area and the main flooring needs to be assessed.

B) Duration Of Contact With The Floor.

This will depend on the overall design of the installation. Thus with a minimum fall to drains of 1.5% a considerable volume of hot liquid spillage would be needed to raise the floor temperature above the HDT of the product. Wherever possible, known bulk discharge should be piped direct to the drains. Where this is not possible, floors regularly subjected to discharge of large volumes of hot liquids can be protected by the installation of cooling sprays. Such a cold water curtain not only cools the floor but dilutes any aggressive spillage to safer levels.

C) Rate Of Change Of Temperature.

With slow changes in temperature, the stresses transmitted to the bond line due to differential expansion between the synthetic resin flooring and the substrate may usually be accommodated. However as lower flooring thickness allows rapid heat transfer through to the bond line rapid changes of temperature may cause failure if the substrate has not been adequately prepared to ensure maximum adhesion.

Although the synthetic resin flooring may soften if exposed to high temperature, its mechanical strength will generally return and no damage occur, provided the area is kept free from traffic during the 'tender' stage. On the other hand prolonged exposure to high temperatures may lead to a degree of post cure manifest in the product becoming more brittle or less flexible and, in the most severe cases, inducing shrinkage stresses within the product leading to cracking or detachment.

D) Steam Cleaning.
A combination of softening and subsequent damage may be caused by misuse of high temperature pressure cleaning equipment, particularly with thinner self-levelling floorings. On more heavily filled screeds, steam cleaning can be satisfactory carried out provided care is taken to ensure that the steam is not allowed to discharge on one place at one time for too long. However for thin layer flow applied flooring, modern cleaning and sterilizing agents and machines are generally more cost effective than steam cleaning.

Curing time
The final floor system shall be allowed to cure according to the manufacturer's instructions. These generally require 1-3 days at 15 - 20°C before allowing significant use by traffic and 3 to 7 days at 15 - 20°C before allowing contact with chemicals or sterilising agents. Adequate curing should always be allowed before wet testing the flooring for drainage or ponding.

At site temperatures below 10°C cure times will be substantially increased unless some form of external heating is used. In assessing curing conditions it should be recognized that the concrete slab temperature will generally be lower than the air temperature and this will govern the rate of cure.

As a general rule, synthetic resin floorings should not be applied unless both air and slab temperatures are greater than 5°C and rising. The ambient relative humidity may also be a critical factor. Floor seals or coatings of Types 1 or 2 will require a relative humidity less than 85% if they are to through-cure satisfactorily. Condensation onto the surface of the resin flooring as it cures may cause 'blooming', a clouding of the surface, and this could be exacerbated if the slab is colder than the air temperature.

Damp proof membranes
New construction
In new buildings a damp proof membrane should have been incorporated into the design of the concrete
base, when ground supported. The membrane is then preferably installed directly below the base. In some fast-track construction an additional membrane may be bonded to the top of the concrete base, to
prevent subsequent operations from being affected by water remaining in the concrete.

Existing buildings
In existing buildings without a functioning damp proof membrane or where there is suspicion of rising
dampness, the following should be considered:

a) Installation of a membrane under a new concrete or polymer-modified cementitious screed. In this case the flooring manufacturer's recommendations for minimum screed thickness should be carefully
followed.

b) Surface-applied membrane: the compatibility of membrane and flooring material must be established.
Systems vary in their resistance to osmotic blistering, and this aspect must be discussed in each situation
with the flooring manufacturer.

c) Certain purpose-designed resin floorings are able to tolerate high levels of moisture in the substrate.

d) Hydrostatic pressure may, under certain circumstances, cause adhesion failure between the flooring
and the substrate. Where this is likely to occur, such as in areas where the ground water table is higher
than the substrate, and where external tanking has not been applied, pressure relief must be provided, eg
by directed drainage.

Tolerances
General
Synthetic resin floorings will generally follow the profile of the underlying substrate, due to the method of
application. The agreed standards for flatness and regularity should therefore be produced in the base
concrete or levelling screed as far as possible. When upgrading existing floors, the means of obtaining the required levels and flatness need to be agreed in advance.

Tolerance to datum plane

The designer should specify the maximum permissible departure of the level of the wearing surface from an agreed or specified datum plane, taking into account the area of the floor and its end use. For most normal purposes a departure of ± 15 mm from datum will be found to be satisfactory.

Greater accuracy to datum could be required in small rooms, along the line of partition walls, in the vicinity of door openings and, where specialized equipment is to be installed directly on the floor.
The datum plane for most floors will be horizontal but, on occasions, sloping.
In the latter case, departure from datum should be measured from the sloping plane.

Surface regularity

The class or category of surface regularity required for a floor surface will depend upon the use of the floor. Insistence on a higher tolerance than needed for the operating conditions will result in unnecessary higher costs and this should be borne in mind in selecting a surface regularity standard.
The tolerances of most industrial concrete floors in Europe are specified as DIN 18202 Table 3, Line 3, or Line 4.

Table 3 — Permitted flatness deviations

Column	1	2	3	4	5	6
Group	Deviations applicable to	Permitted position deviations, in mm, for distances between measuring points, in m, up to				
		0,1	1[a]	4[a]	10[a]	15[a b]
1	unfinished upper surfaces of floors, subfloors and concrete bases	10	15	20	25	30
2	unfinished upper surfaces of floors, subfloors and concrete bases subject to more stringent requirements (e.g. to receive floating screed, industrial floors, tile flooring and bonded screed), and finished surfaces for minor purposes (e.g. in storerooms or basements)	5	8	12	15	20
3	finished floors (e.g. screed as wearing courses or screed to receive a flooring, tiled floorings, trowelled or bonded floorings)	2	4	10	12	15
4	as for group 3, but subject to more stringent requirements	1	3	9	12	15
5	unfinished walls and unfinished ceilings	5	10	15	25	30
6	finished walls and soffits (e.g. plastered walls, wall claddings and linings, suspended ceilings)	3	5	10	20	25
7	as for group 6, but subject to more stringent requirements	2	3	8	15	20

[a] Intermediate values shall be taken from figures 4 and 5, and shall be given to the nearest millimetre.

[b] The values in this column also apply to distances between measuring points of over 15 m.

Where the floor will be subject to wet service conditions, a high class of Surface Regularity may be necessary to minimise ponding.
Where the straightedge method of specification is used it will be necessary for the various interested parties in a contract to agree the sampling rate for testing the floor to check conformity, before the floor is constructed.
The simple straightedge method of specifying floor surface regularity is only suitable for floors finished by conventional finishing techniques that will produce a smoothly undulating surface rather than an irregular 'washboard' finish.

Where a very high degree of accuracy is required, e.g. for high level racking or television studios, specialist test equipment should be used to govern the level of the floor as it is laid and to check its conformity.

The difference in height across any joints in the flooring should be less than 1 mm with no abrupt changes in level. Because of the relatively low thicknesses of some classes of synthetic resin flooring, it is essential that any significant differences in height across the joints in the concrete base or screed are ground flat before the flooring is to be applied.

Testing to check surface regularity and level conformity should be made within 24 h of the first area of flooring being laid to establish at an early stage that the method of laying can meet the specification requirement. Surface regularity and level testing should not be left to be checked until all the flooring is completed.

Falls

A floor, particularly one with a coarse surface texture, will not drain water satisfactorily unless sufficient falls are introduced. A minimum slope of 1.5% should be specified to produce a free draining floor. However, slopes greater than this may lead to problems of slumping if the eventual finish is to be flow applied.

Joints

The number of joints designed into the floor should be kept to a minimum consistent with stability in order to maintain the seamless nature of the surface that will then be easy to maintain.
The spacing of movement joints must be determined by the design of the subfloor.
All movement joints in the subfloor must be carried through the flooring.
In areas where regular trucking occurs it is desirable to reinforce the screed edges at the movement joints: stainless steel or other suitable metal angles may be used or prefabricated joints suitable for this purpose. Alternative methods for forming such joints are shown in Figure 1.
In all instances the necessity for movement joints and their type and positioning should be agreed at the design stage between all parties concerned.

Edge design

Where the new flooring must finish level with an existing floor or around the outside perimeter of the area, feather edges must be avoided. This reduces the risk of early mechanical wear at the edge or of seepage of liquids under the flooring. This can be achieved by forming or cutting a groove in the surface of the concrete floor into which the flooring is then applied, as shown in Figure 1.
For heavy traffic this groove should be to a minimum specification in depth equal to the thickness of the resin screed and twice the thickness of the screed in width, e.g. for a screed of thickness 5 mm, the joint cross-section should be at least 5 mm deep and 10 mm wide. With the flow applied floorings of Types 4, 5 and 7 it is normally sufficient to provide a concrete saw cut approximately 5 mm wide into which the flooring should flow, to terminate at the edge.
Resin coatings of Types 1 to 3 do not usually require a special edge detail.

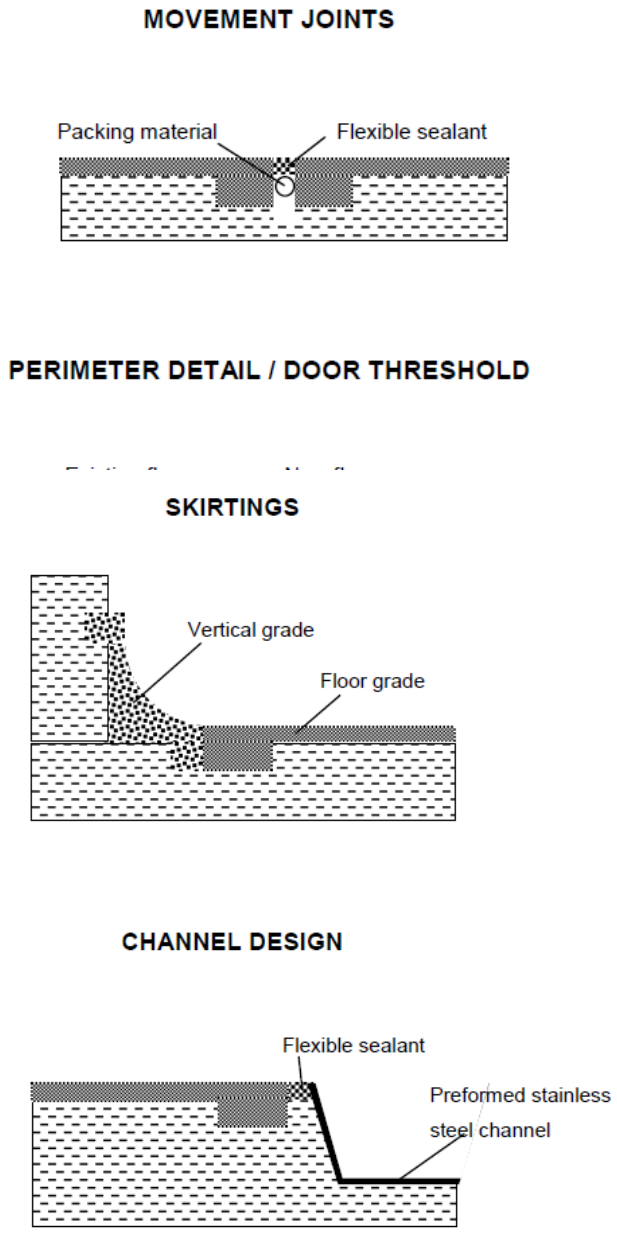
Channels

Channels are normally incorporated in floor systems to carry liquids such as spillages and washing water to suitable drains. By the very nature of their purpose and design they may be subject to more stringent and diverse chemical duty than the individual floor areas from which they receive their contents. The channels must be formed with sufficient slope to ensure complete and rapid flow of any discharge to the drains.

Channel design detail can take a variety of forms and in new installations should be designed in conjunction with the specialist contractor. Frequently a preformed stainless steel channel is inset into the underlying concrete. These are inherently flexible, but should have a formed joint between the flooring and the channel to accommodate vehicular traffic or thermal shock.

In chemically aggressive environments it is advisable to form the channels in the concrete base and then line the channels with the flooring product thereby maintaining a continuous surface and so avoiding joints in a vulnerable area.

Figure 1: Example of joint details (schematic)



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Skirtings

Where the floor is to be washed regularly or where chemical attack is possible it is essential that the flooring is correctly terminated at perimeters, upstands, columns, etc, to prevent ingress of liquid. Frequently a cove is formed using the flooring material. With such a detail a movement joint needs to be installed at the foot of the wall or cove. The free edge of the flooring should then be terminated into a groove formed adjacent to the movement joint rebate. The width and depth of the chase should be nominally equal to the thickness of the flooring. Anchoring the resin flooring into the groove distributes any stresses created by thermal and mechanical action on the floor. Where no movement joint is necessary, a simple vertical extension of the synthetic resin flooring may be applied.

Simple skirting details may be extended to related situations such as kerbs or plinths.

Service penetrations

Although not desirable, in some circumstances services may be required to pass through the flooring surface. A suitable method of achieving this is to have a protective sleeve cast into the base concrete, which permits the services to pass through without direct contact with the floor screed. This is particularly important if the services include pipes carrying liquid at temperatures other than ambient. The sleeve also acts as an upstand to prevent liquids flowing down through the floor.

Stairs

Flooring to the treads can be formed from each of the different classes of flooring. For the risers special thixotropic grades or renders derived from the flooring products may be necessary. The structural concrete should have been formed to the precise profile of the stairs less the thickness of the flooring.

Before commencing application of the flooring the surfaces of the treads and risers should be prepared as described in as for new bases or old bases.

PREPARATION OF CONCRETE BASES AND SCREEDS

General

Because of the wide variety of types of product available commercially, this specification can only provide the basic principles that should govern the necessary preparatory work. It is imperative therefore that the flooring manufacturer's instructions are followed precisely.

From the point of view of structural design of the substrate, whether it is slab or screed, the main function of the flooring is to provide a protective finish. The substrate should therefore be designed independently of the flooring to withstand all structural, thermal and mechanical stresses and loads that will occur during service. It should remain stable whilst protected by the flooring and be provided with all necessary expansion, contraction and crack inducement joints to enable it to do so. Failure of the substrate to remain stable will invariably affect stability of the finish. In particular, cracking of the substrate, however caused, is likely to reflect in the finish.

The surface strength of the concrete base or screed needs to be sufficient to restrain any stresses that occur during the setting and hardening of the synthetic resin flooring.

The surface tensile strength of the concrete base or screed, after preparation to remove the surface laitance, should be determined by the method given in EN1542 and should normally exceed 1.5 MPa.

Where the mean surface tensile strength is less than 1.5 MPa the designer should specify suitable systems, for example reinforcement of the surface with penetrating resin sealers or more extensive preparation and making good.

The substrate needs to be finished with a strong even surface and laid to such falls as necessary. Synthetic resin floorings are relatively thin and cannot in most instances economically alter levels or correct badly-laid substrates.
Where the levels have first to be finely adjusted a polymer-modified cementitious levelling screed may be appropriate.
In coatings or flow-applied systems, there is an inevitable tendency for the finish to mirror imperfections in the substrate. Permissible tolerances for surface regularity of the substrate must therefore be closer than with alternative floorings.

New concrete bases and screeds
The concrete should not contain a water repellent admixture where water-based synthetic resin floorings are to be applied. All services should be confined within the base concrete or screed and not allowed to penetrate into the flooring. In order to achieve sufficient tensile strength in the surface of the base concrete, it should preferably be designed to have a minimum characteristic compressive strength of 35 MPa and adequate workability to allow full compaction.

Unmodified sand/cement screeds are unsuitable to receive synthetic resin floorings because of their low tensile strength, but a polymer-modified cementitious screed or concrete may be acceptable subject to the approval of the flooring supplier.

Care should be taken that during the hardening and curing of the base slab or screed it does not suffer mechanical damage or become contaminated with grease, oil etc.
If such problems do arise the slab or screed should be treated as for old bases.

The concrete and laying technique used should achieve the surface strengths given before the flooring is laid. The surface regularity of the base should match the requirement of the final flooring.

Some synthetic resin flooring systems are tolerant of significant moisture levels in the concrete base. Unless otherwise specified by the flooring manufacturer, the base should be at least 28 days old, with the relative humidity at the surface no more than 75%.

For those synthetic resin floorings that are moisture sensitive during application, it is necessary to ensure that sufficient of the water used in the construction of the base is eliminated. The use of curing membranes will effectively prevent drying out until removed. After the curing of the concrete it is essential that the excess water be allowed to evaporate. The time for this to happen should be taken into account at the planning stage.

Surface preparation is a most vital aspect of all flooring application. The quality and condition of the interface between the substrate and the flooring determine its ability to withstand static and dynamic loads imposed in use.
Failure to transfer loads adequately results in loss of adhesion and hollowness.
The laitance on in-situ bases and any surface sealer or non-bonded curing compound should be entirely removed by suitable mechanised equipment, e.g. shot-blasting, planing, grinding, to expose the coarse aggregate cleanly.

Care should be taken to ensure that high intensity mechanical treatment does not cause micro-cracking to weaken the underlying substrate. For the thinner floorings, light contained shotblasting or diamond grinding is preferred so that the profile does not reflect in the finish.

The surfaces of precast units should be left as cast and should be thoroughly prepared to remove all adhering dirt and laitance. The use of contained abrasive blasting equipment is more suitable than mechanical scabbling which could damage the precast units.

After surface preparation all loose debris and dirt should be removed by vacuum equipment. Very fine dust may need to be removed by detergent washing. The preparation operations should be delayed until shortly before the flooring is to be laid to avoid the risk of fresh contamination or further accumulation of dirt.

Old concrete bases
All surface contamination, e.g. oil, rubber and flaking paint, should be removed and adequate mechanical preparation carried out to achieve a sound and stable surface with exposed coarse aggregate.
When dealing with heavily compacted oil or grease deposits, the bulk of the contamination should first be removed mechanically.
A liberal application of a purpose-designed cleaning preparation should then be thoroughly scrubbed into the surface by the use of a mechanical scrubber. Sufficient time should be allowed for penetration followed by thorough washing with clean water before wet vacuum cleaning the entire surface. If necessary these procedures will need to be repeated until the substrate is clean.

Alternatively a more rapid method which may be used in some situations is high temperature burning, often known as HCA - Hot Compressed Air, followed by shot blasting and then a repeat burning followed by application of a penetrating primer.

Where oil or grease contamination has been severe or of long duration none of these methods may prove satisfactory in preparing the base to allow full bonding of the flooring. In such cases removal of the affected base would be necessary followed by reinstatement with new concrete or polymer-modified cementitious screed.
Alternatively, mechanically fixing a metal mesh over the oil-contaminated concrete would provide a mechanical key for the flooring system but would need an oil resistant membrane installed directly over the concrete.
Existing floor paints should preferably be removed by mechanical abrasion or contained shot blasting. If this is not feasible because of other restrictions on noise, vibration, etc, chemical etching may be used.

When all existing coatings have been removed chemically, the entire surface must be thoroughly rinsed with clean water. All use of chemical agents should comply with local environmental regulations.

When clear of all surface contamination, the concrete should be mechanically prepared to remove all laitance and expose a fresh surface. This can be achieved with suitable mechanized equipment, e.g. shot-blasting, planing, grinding, to expose the coarse aggregate cleanly.
Care should be taken to ensure that high intensity mechanical treatment does not cause micro-cracking to weaken the underlying substrate.

For the thinner floorings, light contained shot-blasting or diamond grinding is preferred so that the profile does not reflect in the finish.
After surface preparation all loose debris and dirt should be removed by vacuum equipment.

Very fine dust may need to be removed by detergent washing.
The preparation work should be delayed until shortly before the flooring is to be laid to avoid the risk of fresh contamination or further accumulation of dirt.

Prior to applying the flooring a close visual examination should be made to verify cleanliness, soundness of the surface and freedom from soft deleterious materials such as lignite and iron pyrites.

Any weak or suspect earlier patching should be removed.
When the base is dust free and reasonably dry, a water droplet test is useful to check that any water repellence has been removed and to assess porosity. The procedure is as follows: a droplet of water from a laboratory wash bottle or syringe is applied to the floor from a height of about 10 mm. If the droplet remains intact and does not spread laterally or soak into the concrete within a few minutes, this indicates that materials might be present that could reduce the bond of the flooring.
In this case, further floor preparation would be necessary to remove the residual contamination. Very densely trowelled high quality concrete bases can be highly impermeable to water penetration and give a similar effect to the presence of water repellents, etc.

Where difficulties in bonding the flooring are anticipated special advice on bonding methods could be necessary. Alternatively a trial area should be applied, allowed to cure and the degree of bond assessed by the method of EN 1542.

Acid etching is no longer a recommended method of surface preparation because of the health and safety risks associated with its use and the fact that the surface is left thoroughly saturated with water and calcareous salts which may cause osmotic blistering at a later stage.

Other substrates
Special procedures are available for other substrates, eg metal, timber, ceramics, etc, and the flooring manufacturer's instructions should be strictly followed.

WORK ON SITE
General
Because of the wide variety of types of product available commercially, this specification can only provide the basic principles which should govern the site application procedures. It is imperative therefore that the manufacturer’s instructions are studied in advance of the work starting, since particular recommendations or restrictions may influence the overall programme.
These instructions should be incorporated in the flooring contractor's method statement.

Materials storage
Storage should be arranged so that consignments can be used in the order of their batch numbers. It is therefore important that labels do not become damaged or detached from their containers.

Powder components and aggregates (including any pigments)

Bags of fillers, aggregates or other powdered components should be kept dry and stored in a weatherproof building. If the floor is concrete, the bags should be stacked on a timber pallet away from walls. Fillers and aggregates should be kept preferably at 15° - 20°C to ensure that the resultant flooring mix does not set too quickly or too slowly.

Liquid components
The containers of resins and hardeners should be stored in a weatherproof building maintained preferably at 15°-20°C, unless the product manufacturer has stipulated other storage conditions for the stated shelf life.

Batching
All materials should be accurately proportioned and mixed in the correct sequence in accordance with the manufacturer's recommendations. It is usual to mix the liquid components together thoroughly before blending in the fillers and aggregates.

The usable life of the mixed materials depends upon the temperature of the mixed materials. Manufacturers' literature should give an indication of the working life of the properly mixed product at one or more temperatures. As a rough guide, a 10°C rise in temperature may halve the working life and a 10°C fall may double the working life. However it is not advisable to mix and lay these products outside of the range 10-25°C unless the system has been specially designed to be used for a different temperature range.

Resin systems are generally exothermic and so an important factor governing the temperature of the mixed materials, is the volume being mixed. Larger volumes will heat up more so shortening the available working life.
If the mixing area is not adjacent to the laying area an appropriate allowance for the time to transfer the mixed material should be made to ensure sufficient time for the product to be installed within the working life.

Mixing

Primers
The primer is usually a two-pack formulation supplied in pre-weighed quantities ready for site mixing. The two components should be thoroughly mixed together mechanically to form a homogenous mix. The two components should be mixed preferably using a slow speed (200-500 rpm) drill fitted with a mixing paddle, taking care not to entrain excessive air in the mix.

It is important to ensure that any material adhering to the sides and bottom of the mixing vessel is always thoroughly mixed in. It is good practice to transfer the mixed material into a clean container and stir well before application. This procedure prevents the use of partially mixed material.

Flooring mix (including trowel-applied mixes, self-smoothing mixes and coatings)
All mixes should be mixed mechanically. Resin coatings shall be mixed using a heavy-duty slow speed drill (200-500 rpm) drill fitted with a mixing paddle. Forced action mixers of the rotating pan, paddle or trough type shall be used for all flow applied and trowel applied screeds.
Free fall mixers are not recommended because there is insufficient shear action to disperse all the dry materials.

The reactive components are first thoroughly mixed together and then the fillers and/or aggregates are added gradually whilst continually stirring. After all the fillers and/or aggregates have been added, sufficient mixing time (typically 3-4 minutes) must be given to ensure thorough 'wetting' out of the fillers and/or aggregates by the binder.

Excessively vigorous mixing shall be avoided as this can lead to undesirable air entrainment.
Care should be taken to ensure that any material adhering to the sides, bottom and corners of the mixer is thoroughly blended in.

Laying Synthetic Resin Flooring

Priming the substrate
The primer should be chosen to be compatible with the conditions of the substrate.
After mixing the components of the primer together, it should be applied as soon as possible after mixing (and well within its working life) to the prepared substrate.
The primer should be applied evenly to the substrate with a stiff brush or roller or by tight trowelling.
The substrate should be completely wetted by the primer to achieve maximum penetration into the substrate and ensure good adhesion and to prevent pin-holing.
Full saturation of the surface is desirable but pooling of the primer should be avoided by using a roller to remove any excess.
When applying the screeded synthetic flooring of Types 6 and 8, a useful technique is to apply a scatter of fine dry aggregate over the liquid primer, but avoiding localised saturation, in order to provide a key for dhesion of the flooring and to reduce slippage under the trowel.
As a guide an aggregate addition rate of 0.5 to 1.0 kg per m2 should be suitable. This also helps to reduce the risk of limited bond if the primer has cured too far.

With flow applied systems, two coats of primer, or an excess of primer in one coat, may be necessary to prevent pin hole defects in the finish, and it is a wise precaution to provide for this in terms of material consumption and timing.

The area of substrate which can be coated with the primer prior to the laying of the flooring will depend on the working life of the primer, as specified by the manufacturer. Unless otherwise specified, the primer should be partially cured to a tacky stage before the resin flooring is applied, to ensure a good bond between the primer and the applied resin finish.
However for certain systems, particularly flow applied resin systems, it is essential that the primer should have become tack free. The manufacturer's instructions must therefore always be followed.

Resin Coatings (Types 1-3)
These coatings are usually applied by spray, brush or roller in 2 or more coats, applied at right angles to each other. Typically the first coat is allowed to cure before the second coat is applied.
The manufacturer's instructions on timing must be followed to ensure full bond between the coats.

Multi-layer flooring (Type 4)
These products are normally made using combinations of floor coatings (Types 2-3) or flow-applied flooring (Type 5) with intermediate aggregate scatter. They should be applied strictly in accordance with the manufacturer's instructions.

Flow applied systems (Types 5 & 7)
These compositions are designed to flow out readily in order to provide a smooth substantially level surface. They are applied by spreading evenly over the surface, using a serrated trowel, pin rake or squeegee. This should be followed by rolling with a spiked roller to release any entrapped air and assist in smoothing out. The use of the spiked roller on areas which are starting to thicken or are partially set should be avoided.
The quality of surface finish achieved with flow applied systems is particularly temperature sensitive and the manufacturer's recommendations in terms of minimum air and slab temperatures should be strictly adhered to.
Forced heating of the atmosphere over a cold slab is undesirable since it can promote blistering of the surface.

Trowel-Applied Resin Flooring (Types 6 & 8)
The material should be spread out over the primed substrate between screeding laths or bars or using a screed box (sledge) to ensure a uniform thickness and level surface throughout. The screed should be well consolidated in order to obtain the optimum properties from the end product.
A final smooth finish should be obtained using a suitable steel trowel. Carbon steel trowels can lead to unsightly marking of the flooring surface.
The trowel should be kept clean at all times by using a minimum amount of cleaning solvent or water as advised by the manufacturer.
Over-trowelling should be avoided as this can cause patchiness and blistering in the finished floor.
Trowel-applied resin flooring provides a durable slip resistant floor surface for most applications.

However if a more hygienic surface is required, it may be necessary to seal the surface using a one or two coat application of a compatible resin sealer, much of which is absorbed into the trowel applied flooring.
This may be either a solvent-free or solvent-containing system applied by brush, squeegee or roller.
It is usually applied after the screed has cured, but taking care to ensure that the surface has not been contaminated during the curing period.

Curing

The final floor system should be allowed to cure according to the manufacturers' instructions. These generally require 1-3 days at 15°-20°C before trafficking and 3-7 days before washing, before contact with chemicals, or before any ponding tests.
At site temperatures below 10°C these times will be substantially increased.
The climate above the uncured resin floor should be maintained at least 3°C above the dew point or below 75 % relative humidity to reduce the risk of condensation or 'blooming' on the floor finish.

Condensation occurs when the substrate temperature is lower than the dew point temperature, which is a function of the relative humidity and the ambient air temperature. Table 4 shows the approximate relationship between these variables.
Table 4: Dew point temperatures

Table 4: Dew point temperatures

Ambient dry temperature °C	Dew point temperatures (°C) for ambient relative humidity between 40 and 100% R_H						
	40%	50%	60%	70%	80%	90%	100%
35	19	23	26	29	31	33	35
30	15	19	22	24	26	28	30
25	11	14	17	19	21	23	25
20	6	9	12	15	17	18	20
15	2	4	7	10	12	13	15
10	-3	0	3	5	7	9	10
5	-7	-5	-2	0	2	4	5

OSMOTIC BLISTERING

Occurrence

In a few cases severe blistering of synthetic resin floorings occurs some while after laying, typically between 3 months and two years later. These blisters commonly vary in size from a few mm in diameter up to 100 mm with heights up to 15 mm.
When drilled into or otherwise broken the blisters are found to contain an aqueous liquid under considerable pressure. The mechanism of their formation is not fully understood but it is assumed because of their physical state that they are caused by a process of osmosis.
Blistering which occurs soon after laying is generally caused by vapour pressure from moisture in the substrate.

Osmotic blisters are generally confined to synthetic resin floorings, resin coatings and flow applied systems, up to about 6 mm in thickness. The problem has not been observed with trowel applied resin floorings probably because of their higher resistance to deformation and greater lateral permeability.

Osmotic blistering can occur on suspended floors, as well as on ground supported slabs, if sufficient moisture is retained in the concrete.

Prevention
Because the mechanism is not fully understood it is not possible to be specific about the steps which should be taken to avoid osmotic blistering. However it is considered good practice to take the following steps in order to minimize the risk.

a) In new construction ensure the base concrete has low soluble salts by avoiding poorly washed aggregates and by curing the concrete well immediately after laying to prevent premature surface drying out;

b) Allow the concrete to dry out thoroughly after curing, preferably for a minimum of 21 days;

c) By the use of mechanical rather than chemical means of preparing the concrete surface. In particular by avoiding the use of acid etching;

d) By avoiding washing the concrete surface with detergent solutions as part of the preparation procedure;

e) By the complete removal of all contamination from existing floors: this may prove very difficult where the concrete has been saturated for long periods with water soluble materials;

f) Any levelling screeds should preferably be polymer-modified to minimize permeability and salt migration;

g) By avoiding the use of water-dispersed primers;

h) By the use of primers which are free of water soluble constituents which might promote osmosis, for example, benzyl alcohol;

j) By avoiding the use of solvents, especially in the primer;

k) By ensuring that the synthetic resin flooring is precisely proportioned, either by weight or volume as specified by the product manufacturer;

l) By applying a scratch coat underneath.

Repair
Where osmosis has occurred, techniques which have proved successful in preventing the problem reappearing,
after cutting out the affected area and mechanically cleaning the exposed concrete, include:

a) Double application of a penetrating primer to the base to ensure complete coverage and maximum adhesion of the replaced flooring;

b) Replacing with a trowel applied flooring;

c) Hot compressed air blasting of the exposed concrete coupled with the application of a penetrating primer whilst the concrete is still warm.

HEALTH AND SAFETY PRECAUTIONS

General

a) Care shall be taken to ensure that all procedures comply fully with national and local Health and Safety and Environmental regulations.

b) Before starting any operations the manufacturer's Materials Safety Data Sheets for all the flooring products to be applied shall be studied and all recommendations followed in addition to those listed here.

Synthetic resin flooring

When mixing and/or laying synthetic resin floorings, precautions taken should include the following:
a) Full protective clothing should be worn to prevent all contact of the products with the skin. Gloves resistant to the synthetic resins should be worn at all times. Goggles or full face shields should be worn during mixing and at any time when splashing is a risk.

b) It is good practice to apply an appropriate barrier cream on the hands at the beginning of each session.

c) Any splashes of product on the skin should be washed off immediately using soap and water or preferably a proprietary resin-removing cream. Cleaning solvent should never be used on the skin since it defats the surface and aids deeper penetration of the contamination.

d) Any splashes of the product in the eye should be treated immediately by washing with copious amounts of water. Medical treatment should then be sought taking full product details so that correct medication can be supplied.

e) None of the flooring materials should be swallowed. If any is accidentally ingested a doctor should be consulted immediately. The consumption of food and drink shall be prohibited in the vicinity of the mixing and laying operations.

f) Effective exhaust ventilation to atmosphere should be provided in all areas where the flooring products are being mixed or applied, to prevent build up of fumes or contamination of adjacent areas.

g) Smoking should not be allowed in the vicinity of the mixing or laying operations.

h) Some synthetic resin flooring products contain flammable components, which are not necessarily solvents. No sources of ignition should therefore be allowed in areas where the components are stored, blended or applied.

INSPECTION AND TESTING OF FLOORING

Inspection

The works should be inspected during progress and after completion, special attention being paid to the following:

a) quality and preparation of the base;
b) levels and surface regularity of the base;
c) climatic conditions, throughout the application stages;
d) priming of the base;
e) mixing/batching of the flooring;
f) laying the flooring, including the applied thickness;
g) levels and surface regularity;
h) sealing, if any;
i) curing;

MAINTENANCE

Under normal circumstances, frequent washing of the surface with a compatible detergent solution should be sufficient to maintain the floor surface in a clean condition. In areas where hygiene is of prime importance regular sterilisation with bactericide solutions should be adopted.
Food preparation areas, where there is the risk of accumulation of fats or food residues, may need frequent hot water jetting at temperatures of 60 to 80°C. Steam cleaning may be appropriate in some cases but the type of flooring used must have been chosen to suit.

All potentially corrosive spillages should be immediately mopped up with appropriate absorbents or washed away with copious amounts of water.

Localised damage to the floor surface should be repaired at the earliest opportunity to prevent liquids penetrating to the bond line and causing lateral failure.

A detailed record, including location, extent and date(s), should be maintained of all damage and subsequent repairs.

GENERAL METHOD STATEMENT FOR PAINTING

GENERAL INSTRUCTION

All work shall conform to approved manufacturer's specific recommendations.

WORK INCLUDED

Provided all materials, labour and equipment required to complete the painting works, together with ancillary work herein described and implied to the full intent of the drawings and schedules.

Make thorough examination of drawings, details and schedules, determine the intent, extent, materials, and types of surfaces, locations and be fully cognizant of requirements.

Examine the specifications and drawings for the work of other Section regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted, and which are left unfinished or unpainted by other Sections.

Provide finishes free of defects in materials and workmanship affecting appearance and performance. Defects shall include, but not be limited to improper cleaning and preparation of surface, entrapped dust and dirt alligatoring, blisters, peeling, drips, runs, uneven coverage, misses, poor cutting in, improper use or application of materials.

All paints shall be manufacturer tinted to required colours and thoroughly mixed before application.

Comply with toxic trace limitations stipulated by the authorities having jurisdiction.

Frame spread rating finishes shall conform to the local building code.

1. SUBMITTALS

Paint colours will be selected by the Consultant Architects and P.R. from approved manufacturer's colour range. Consultant Architect and P.R. will furnish Schedule showing where the various colours, gross value and sheen of the finishes occur.

2. DELIVERY, HANDLING AND STORAGE PROTECTION

Delivery material to site in sealed original containers with labels intact and store in space as directed. Keep stored materials covered at all times. The presence of any unauthorized materials or containers for such on the site shall be sufficient cause of rejection of all paint materials on the site at the time.

Exercise extreme caution in the storage of materials to prevent fire or create fire hazards. Thinners and solvents shall be stored in approved metal safety containers in accordance with governing fire and safety regulations.

In areas of storage, protect floor and wall surfaces from paint drips and splatters. Protect floors with sheets of clean plywood or metal panels where mixing and strictly enforce this requirement. Provide and maintain CO fire extinguishers of minimum 9kg capacity accessible in storage mixing areas.

Leave storage areas clean and free from evidence of occupancy when these are required for intended use.

Keep waste rags in metal drums containing water and remove from building at end of each working shift.

3. ENVIRONMENTAL CONDITIONS

All areas shall be clean and dust free before painting is commenced.

Use sufficient clean drop cloths and protective coverings for full protection of floors, furnishings and works not being painted. Protect mechanical, electrical and special equipment and all other soiling during painting process. Mask adjoining work adjacent to work being painted or carefully cut-in-Without overlaps. Clean surfaces soiled by spillage of paint and paint spatters. If cleaning operations damages the surface, repair or replace damage work without cost to the Employer.

On exterior work, do not paint during or immediately following rain.

In cases of damage, surfaces shall be cleaned and repainted to Architects satisfaction.

Leave areas clean and free from evidence of occupancy upon completion of painting.

Do not paint surfaces exposed to direct sun or where condensation has or will form due to the presence of high humidity and lack of proper ventilation.

4. MATERIALS

Paint and Finishing Materials: Undiluted (unless recommended), highest grade, first line quality of the approved manufacturer, correctly labelled, bearing the brand and maker's name, type of paint, colour and code number.

Primer: Made for the purpose by the approved manufacturer of finishing materials being used.

Flame spread ratings of interior finishes shall conform to the Bfl,s1 and/or Bs1d0 code and certificate provided.

Brushes, Rollers and Application Spray Equipment: The best of their respective kinds, clean and suitable for the work.

5. MIXING

Ensure that paint has not settled, caked or thickened in the container, is readily dispersed with a paddle to a smooth consistency and has excellent application properties.

Use all reducing and tinting materials as recommended by the approved manufacturer for the particular material reduced or tinted.

Mix materials thoroughly before application. Make sure 2-pack paints are mixed and prepared according to attached provided datasheets, and observe product's pot life.

6. INSPECTION

Examination: Examine the work upon which the work of this Section depends prior to the application. If surfaces cannot be put in proper condition by customary cleaning, sanding and puttying, report such defects in writing.

Acceptance: Failure to report defects will constitute acceptance or surfaces.

Moisture Content: Do not paint surface while moisture content as tested by moisture meter exceeds the following:

Masonry and concrete surfaces 10%

Interior plaster and gypsum board 12%

Concrete Floors 4%

Lighting Level: Do not apply finishes or undertake surface preparation unless illumination characteristics are acceptable for production of first class job.

7. PREPARATION

Dust: Clean floors, adjacent surfaces and surfaces to be painted before work is commenced.

Defects: Ensure that surfaces to be finished are clean, free from machine, tool or standing marks, dust, grease, soil or other extraneous matter and all defects or sanding marks which could be detrimental to an acceptable finish.

Alkaline Surface: Neutralize highly alkaline surfaces with a neutralizing wash of 10% solution of Zinc Sulphate. Brush off residue before painting.

Mildew: Scrub mildewed surfaces with a solution of Disodium Phosphate, bleach with a solution of 1 part Sodium Hypochlorite to 3 parts water and rinse with clear water.

Mask and cover surrounding surfaces, coordinate and remove ironmongery, electric plates and accessories as required to keep paint from adjacent surfaces. Mask labels and specification plates occurring on equipment to be painted. Properly mask all sprinkler heads and fire detectors wherever they occur in surfaces to be painted. Remove tape when paint is dry and clean. Do not clean hardware with solvent that will remove permanent lacquer finish. Reinstall after completion.

8. APPLICATION

Approved Manufacturer's Instructions: Apply materials in accordance with the directions and instructions of the approved manufacturer of the materials.

Workmanship: Execute the work in accordance with the recognized highest standards of workmanship of the industry and to meet requirements of the specification. Work shall be executed by approved workers specially trained and having a tradesman qualification certificate of proficiency. Have an approved full time senior qualified representative at the site to direct the work.

Painting shall be minimum three-coat work throughout. Priming coat shall be colour toned lighter than undercoat, undercoat lighter than the first finish coat: final coat shall be approved colour.

Each coat shall be inspected by the Consultant Architect and P.R. Recoating occurs without Consultant Architect and P.R. inspection, it shall be considered as not having been done and shall be re-coated.

Paint shall be applied by means of roller for floor paint, except for wall, and ceiling surfaces on which the paint shall be applied by rollers or by spray painting. Brush paint is recommended for trim, skirting etc.

Consultant Architect and P.R. may at any time prohibit use of spray painting for such reasons during application as carelessness, poor masking or protective measures, drifting paint fog, disturbance to other trades or failure to obtain a dense, even, opaque finish. All motors, fans, and mechanical ventilation system equipment shall be shut off during spray painting.

Appearance: Apply materials evenly, uniform in thickness, colour, texture and gloss under adequate illumination.

Finishes shall be free of defects in materials and workmanship affecting appearance and performance visible from a distance of 2m defects shall include, but not be limited to improper cleaning and preparation of surfaces, entrapped dust and dirt, blisters, peeling, drips, runs, uneven coverage, misses, poor cutting in, improper use of application of materials. Apply coats of the proper consistency as received from the container.

Sand: Semi-gloss, medium and high gloss shall be sanded lightly between coats if time between coats have been exceeded.

Dryness: Each coat applied shall be thoroughly dry before the next coat is applied. Follow approved manufacturer's directions for drying time.

Doors:

DO NOT paint stainless steel or bronze door butts.

Paint steel door butts in the following manner: Paint the trim half of each butt 2 coats to match the colour of the door trim: and paint the door half of each butt 2 coats to match the colour of the finish of the door. Paint the pivot portion to match the trim.

Exterior doors shall have tops, bottoms and side edges finished the same as the exterior faces of these doors.

Do not paint over label on steel doors and frames, and other identification labels.

Ledges: Finish projecting ledges, both above and below sight lines as specified for surrounding surfaces.

Mechanical and Electrical Items

Removable grilles, gratings, louvers and access panels for convectors and ventilating system and perimeter heating enclosures shall be removed and painted separately, if not factory finished. Reinstall when dry.

Where the back of the unit, wall or insulation are visible through grilles or louvers, paint such surfaces.

Paint access doors and frames to match the surface in, which they occur.

Remove and reinstall electrical outlet covers.

Patching

Do all retouching to ensure that the work is handed over to the Owner in perfect condition, free of runs, spatter, rust, watermarks, scratches, blemishes or other disfiguration.

After fully decorating retouching and finishing a room or area, notify the Consultant Architect and P.R. After inspection and acceptance, post sign "DECORATING COMPLETE – NO ADMITTANCE WITHOUT PREMISSION"

Repaint the entire plane of areas showing defects of incomplete coverage. Patching will not be permitted.

9. FIELD QUALITY CONTROL

Arrange a site meeting between the Consultant Architect and P.R. with the approved paint manufacturer's representative prior to the commencement of the painting operations to discuss the painting and finishing procedures to be used and to analyse the surface conditions in order that alternative recommendations may be made to the Employer and P.R. should adverse conditions exist. Discuss the following items.

- Environmental conditions for each area
- Maximum moisture readings or surfaces and type of reading meter to be used.
- Remedy of defects in surfaces
- Paint thickness measurements and acceptable tolerances

Arrange with the approved paint manufacturers to visit the site at weekly intervals or more often if requested, during the surface preparation and painting operations to ensure that the proper surface preparation has been completed, the specified paint products are being used, the proper number of coats are being applied and the agreed finishing procedures are being used. Arrange for the approved paint manufacturer to regularly submit written reports to Consultant Architect and P.R.

An area located in the building will be designated for site tests.

Apply samples of finishes in the testing area. Apply the samples with the correct material, number of coat, colour, texture, and degree of gloss required. Refinish it if required, until acceptance of the Consultant Architect and P.R. is obtained.

Leave test areas undisturbed until completion of the work. Approved work in the test area shall serve as a standard for similar work throughout the project.

Work, which does not match the approved sample finishes, shall be corrected and refinished.

10. CLEANING

Promptly as the work proceeds and on completion of work, remove all paint spilled, splashed or spattered. During the progress of the work, keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris. At the conclusion of the work, leave the premise neat and clean to the satisfaction of the Consultant Architect and P.R.

Data sheets

At the end of this document you will find the relevant data sheets all for the products recommended in the system proposed by JUNO Paints Ltd.

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Techncal Datasheet

PAVIMYC HB 2/C

Product Code: 07930/20 Flooring

100% solids epoxy coating formulated with epoxy resins and pigments providing high chemical resistance and durability.

DESCRIPTION

PAVIMYC HB 2/C is a 100% solids epoxy coating formulated based on modified epoxy resins. Allows for multiple systems of continuous coatings to be achieved with one single product. (Smooth, non-slip, multilayer or self-levelling systems).

USE: INTERIOR

PAVIMYC HB 2/C is recommended as;

- Smooth or non-slip sealing layer on concrete and other cement based substrates.
- Intermediate coating in self-leveling floor systems

Areas of use as flooring in all types of industry, workshops, warehouses, factories, parking etc.

Not recommended for painting surfaces with tar and/or bituminous asphalt coatings.

For more information, see the rest of the sections indicated in this technical sheet.

PROPERTIES

- Easy application.
- High opacity level.
- Floor surface leveling with low product consumption.
- Very good adhesion properties.
- Excellent chemical and mechanical resistance.
- Excellent hardness
- Protects concrete pavements from erosion.
- Seals and protects concrete pavements against spills of various types of products.
- Facilitates cleaning of any type of surface stains.

CERTIFICATIONS

- Determination of permeability to carbon dioxide UNE-EN 1062-6:2003
- Determination of permeability to water vapour. Capsule method. UNE-EN ISO 7783:2019
- Determination of permeability to liquid water UNE-EN 1062-3: 2008
- Determination of adhesion by direct traction UNE-EN 1542:2000
- Resistance to strong chemical attacks UNE-EN 13529:2005
- Determination of resistance to abrasion. Taber abrasion test apparatus. UNE-EN ISO 5470-1:2017
- Rapid deformation tests (impact resistance). Rapid-deformation (impact resistance) tests - Part 1: Falling-weight test, large-area indenter
- Material testing methods for continuous screeds. Determination of resistance to bending and compression. UNE-EN 13892-2:2003
- Fire resistant Fireproof B-S1, d0
- Certificate of low emissions A+
- CE certificate

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Technical Datasheet

PAVIMYC HB 2/C

Product Code: 07930/20 Flooring

PRODUCT DETAILS

Packaging	Component A: 15,2 Kg. Component B: 4,8 Kg. **Component A + B: 20 Kg.**
Density	Density Comp. A: 1.59 ± 0,1 gr/cc S/FR1001 (colour dependant) Density Comp. B: 1,04 ± 0,05 gr/cc S/FR1001) **Mixture density: 1,44 ± 0,1 gr/cc S/FR1001 (colour dependant)**
Finish	Gloss
Colour	Junomatic Industrial colouring system
Mixing-ratio (weight)	79:21
Solids content	± 100%
Storage and conservation	Store in a dry place at a temperature between 5°C and 30°C. The containers must be well closed and not damaged.

TECHNICAL DETAILS

Shore D (ISO 868:2003)	Shore D: 78 (7 days/+23°C)
Abrasion resistance	36 mg (CS 10/1000/1000) (7 days / +23°C)
Tensile adhesion strength	>1.5 N/mm² (concrete failure)
Chemical resistance	**Consult technical department**

APPLICATION INFORMATION

Mixture potlife

Temperature	Time
+10°C	≈50 minutes
+20°C	≈40 minutes
+ 30°C	≈25 minutes

Repaint time

Temperature	Minimum	Maximum
+10°C	30 hours	3 days
+20°C	24 hours	2 days
+ 30°C	16 hours	1 day

Curing time

Temperatura	Step-on time	Light Traffic	Total curing time
+10°C	≈72 hours	≈6 days	≈10 days
+20°C	≈24 hours	≈4 days	≈7 days
+ 30°C	≈18 hours	≈2 days	≈5 days

This information can be affected by environmental conditions (temperature and humidity).

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SYSTEM APPLICATIONS

SMOOTH FINISH SYSTEM	Product	Consumption
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Prod. Code 07915)	1-2 x 0.3-0.5 kg/m^2
Finish	1-2 coats Pavimyc HB 2/C (Prod. Code 07930)	1-2 x 0.25-0.3 kg/m^2

ANTI-SLIP COATING SYSTEM*	Product	Consumption
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Prod. Code 07915)	1-2 x 0.3-0.5 kg/m^2
Finish + Microspheres	1-2 coats Pavimyc HB 2/C (Prod. Code 07930) + Microspheres (Prod. Code 07250)	1-2 x 0.25-0.3 kg/m^2

*Degree of anti-slip depends on surface condition.

SELF-LEVELLING SYSTEM ≈1 mm	Product	Consumption
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Prod. Code 07915)	1-2 x 0.3-0.5 kg/m^2
Smooth self-levelling finish	1 part Pavimyc HB 2/C (Prod. Code 07930) + 0.5 part sand 0-1-0.3 mm	1.69 kg/m^2 mixture (1.12 kg/m^2 of Pavimyc HB 2/C + 0.57 Kg/ m^2 of sand)
SELF-LEVELLING SYSTEM ≈1.5-3 mm	**Product**	**Consumption**
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Prod. Code 07915)	1-2 x 0.3-0.5 kg/m^2
Smooth self-levelling finish	1 part Pavimyc HB 2/C (Prod. Code 07930) +1 part sand 0-1-0.3 mm	1.9 kg/m^2 mixture (0.95 kg/m^2 of Pavimyc HB 2/C + 0.95 Kg/ m^2 of sand) per mm.

MULTI-LAYER SYSTEM ≈1 mm	Product	Consumption
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Prod. Code 07915)	1-2 x 0.3-0.5 kg/m^2
Sand broadcasting	Sand 0.3-0.6 mm or 0.7 mm	4 kg/m^2
Removal and vacuum of surplus sand		
Finish	2 coats Pavimyc HB 2/C (Prod.Code 07930)	2 x 0.35 kg/m^2

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MULTI-LAYER SYSTEM ≈2-3mm	Product	Consumption
Primer	1-2 coats Pavimyc HB 2/C PRIMER (Product Code 07915)	1-2 x 0.3-0.5 kg/m^2
Sand broadcasting	0.3-0.6 mm or 0.7 mm.	4 kg/m^2
Removal and vacuum surplus sand		
Intermediate self-levelling coat	1 part Pavimyc HB 2/C (Prod. Code 07930) + 0.5 parts sand 0-1-0.3 mm	0.9 kg/m^2 mixture (0.6 kg/m^2 Pavimyc HB 2/C + 0.3 Kg/m^2 sand)
Sand broadcasting	Arena 0.3-0.6 mm or 0.7 mm.	4 kg/m^2
Removal and vacuum surplus sand		
Finish coats	2 coats Pavimyc HB 2/C (Prod.Code 07930)	2 x 0.35 kg/m^2

The consumptions expressed are indicative and may vary depending on the surface texture.

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PAVIMYC HB 2/C

Product Code: 07930/20 Flooring

SURFACE PREPARATION

CEMENTITIOUS AND CONCRETE SURFACES

- As a general rule, surfaces must be firm, dry and clean with a minimum tensile strength of 15 kg/cm² and a compressive strength greater than 25 N/mm².
- Substrate humidity level must always be less than 4% measured at 2 cm depth before application.
- Eliminate grease and rubber stains by means of a suitable mechanical process (blasting, milling or diamond grinding). If it is not removed, consult the technical department.
- Laitance and curing agents must be removed by means of a suitable mechanical process (blasting, milling or diamond grinding), subsequently vacuuming the resulting dust, to obtain a rough surface free from foreign materials.
- It is advisable to apply a preliminary test patch in a representative area (1 m²) to ensure product suitability.

APPLICATION TIPS

- Stir products until completely homogenized.
- Apply on consistent, clean, dust-free surfaces, free from efflorescence (saltpetre) and mould.
- Dilute a maximum 3% with D-90 (Cod. 50.010) for sealing systems. In the rest of application systems do not dilute.

Environmental conditions	• During the application and curing process the temperature must be kept above 10°C and below 30°C. • Relative humidity should not exceed 75%. There should be no rising damp or surface moisture greater than 4%. • The temperature of the substrate must be at least 3 °C above the dew point. Avoid condensation. • Do not apply with risk of rain or strong wind.
Mixture preparation	Stir component A in its container and once homogenized add component B slowly to it, while performing mechanical stirring at low revolutions (400 RPM). Shake for 2 minutes until perfectly homogenized. If necessary, pour he container mixture into a new container and stir, to guarantee a homogenous mixture as possible. Do not use the coating after expired mixture pot life.
Application method	Short-haired roller, brush, notched trowel at supplied viscosity.
Cleaning	Clean application tools with **D-90 Solvent (Product Code 50.010)**.

OBSERVATIONS/ LIMITATIONS

- The use of sweeping machines to clean the floor can dull the shine of the product and alter its colour. It is recommended not to wet the product until it is completely cured (white spots could appear).
- Pavimyc HB 2/C can be applied outdoors, although it must be taken into account that it can turn yellow due to the effect of UV rays.
- Dilute a maximum of 3% with D-90 (Cod. 50.010) for sealing systems.
- Pavimyc HB 2/C must be protected during the first 7 days of contact with water and high ambient humidity, these factors can affect the properties and final aesthetics of the product.
- Do not apply Pavimyc HB 2/C on a surface with rising damp or surface humidity greater than 4%.
- The technical data is based on laboratory tests, the actual measurements of these data may vary due to circumstances beyond the control of JUNO Paints.

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PAVIMYC HB 2/C

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SAFETY & ENVIRONMENT

- Solvent-based products must be applied with good air ventilation and using the necessary protection equipment.
- Avoid sources of ignition.
- Minimize product waste by estimating the amount needed, taking into account the m^2, the porosity and surface texture.
- Store surplus material (as long as the components have not been mixed) in a ventilated and dry place. The container should be clean and the right size for the amount of product left over. Close the containers carefully and keep in an upright position to avoid spills.
- Preserve containers from frost, high temperatures and direct exposure to sunlight. Recover unused product for future use and to save the environment.
- Do not eat, drink or smoke during the preparation and application of the product. Surface preparation and application operations must be carried out with the corresponding safety measures. For more information consult the Safety Data Sheet.
- In case of contact with eyes, wash with clean and abundant water.
- Keep out of the reach from children.
- Do not discharge into drains or the environment. Dispose of at an authorized waste collection point. Consult your City Council about the correct recycling of both the container and waste and leftover paint in accordance with the law and principles of respect for the environment.

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