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AltroFlow™ PUM Excel

2-4 mm Self Smoothing Polyurethane Flooring
Technical and Installation Guide

SEPTEMBER 2013

Product Description
FeRFA Type 5

AltroFlow PUM Excel is medium duty polyurethane resin screed that is flow applied to give a 2-4mm self smoothing surface.
It provides an easily cleaned seamless matt finish which demonstrates outstanding chemical resistance ensuring durability in the most demanding of industrial environments.

Altroflow PUM 2mm & 4mm- 12.6kg kit.

Standard Colours

Available in a range of 5 standard colours.
Bespoke colours are available subject to technical constraints. It must be noted, in common with other PU Screeds, lighter colours and blue will be prone to cosmetic yellowing on exposure to UV light. Please speak to Altro Technical prior to planning non standard colours.

Typical Areas of Use

- Food processing/ Packaging areas (Dry area)
- Bottling Plants (Dry area)
- Warehousing
- Industrial print shops
- Production halls
- Pharmaceutical manufacturing
- Plant rooms

Advantages

- Ease of Installation
- Ease of cleaning
- Good chemical and stain resistance
- Provides seamless floor finish (substrate joints must be cut through)
- Durable
- Matt finish
- Unlikely to taint food stored in close proximity to material cured for 24 hours at 20°C
- Meets the European Directive on the Hygiene of Food Stuffs (93/43/EEC)

Sustainability

Altro 6 steps to sustainability program seeks to optimise our performance with respect to the planet's resources.
Please refer to www.altro.com for further information.

Chemical Resistance

AltroFlow PUM affords outstanding resistance to a broad range of commonly used chemicals. However, premature contact with chemicals (including water) during the curing process may give rise to discolouration, staining and variation in gloss. In all cases of chemical spillage, it is essential that the spillage be immediately removed and the surface washed down with clean water, removing water by wet vacuum after operation. Although some chemicals may cause discolouration, this may not affect the durability and integrity of the resin screed. Please refer to Altro and FeRFA Guidance Note No.3 for further information.

Typical Physical Properties

Slip Resistance	AltroFlow PUM potential for slip: low. Tested to BS 8204: Part6: 2001 using a TRRL (Transport Road Research Laboratory) Pendulum slip tester and 4 S rubber (Standard Simulated Shoe Sole).		
Speed of Cure		Light Foot Traffic	48-72 hours @ 10°C 17-24 hours @ 20°C
		Full Cure	7 days @ 20°C
Application Temperature			10°C to 25°C
Usable Working Life			30 minutes @ 20°C
Taber Abraision	ASTM D4060-95	H22 Wheels 1000 cycles 1kg	Average wear 1200 mg
Compressive Strength	BS EN 13892 Pt 2		34 MPa
Flexural Strength	BS EN 13892 Pt 2		8 MPa
Tensile Strength	BS 6319 Pt 7		5 MPa
Hardness	Shore D		80

Packaging

AltroFlow PUM is available in a 12.6kg, four-part composite pack.
A separate premeasured pigment pack is available for ease of mixing and use.

Coverage

Altro Consolidating Primer 24 m^2 per 5 kg unit
AltroFlow PUM @4mm – 0.14m^2 per kg
AltroFlow PUM @2mm – 0.28m^2 per kg

Material usage is dependent upon temperature, surface profile and porosity; stated coverage rates should be referred to for guidance only and cannot be relied upon to determine exact quantities.
Although stringent quality assurance processes are employed, when colour consistency is required, a single batch should be used.

Storage

Ensure that the product is received in good order and store in a dry, frost-free environment, ideally between 15°C and 20°C for at least *three* days before laying.
It is important to maintain the aggregate temperature during storage; low temperatures in the aggregate will adversely affect the product application.
Excessively high and low storage temperatures will affect the laying performance of the product.

Substrate Substrates

AltroFlow PUM may be applied to a variety of substrates including, but not limited to, concrete, polymer-modified cementitious screeds, terrazzo, 25mm WBP plywood (consult Altro for further guidance). For all proprietary subfloor systems refer to the manufacturer for recommendations and seek further guidance from Altro.
FeRFA, The Resin Federation, does not recommend Calcium Sulphate, Anhydrite or Hemi-hydrite screeds for overlayment with synthetic resin surfaces.

Substrate Requirements

Substrates should be dry, structurally sound and free from contamination, friable materials or laitance which may affect either the adhesion or penetration of the resin system.
All residues of old paint coatings and dust must be removed.
Substrates to achieve 30N/mm^2 compressive strength (BS EN 12504-2:2001) and surface tensile strength 1.5N/mm^2 (BS EN 13892-8:2002). Substrates must include an effective damp proof membrane and contain residual moisture not greater than 5% by weight (75% R.H.) to BS 8203:1996.
Thin-bed synthetic resin systems follow the surface of the substrate, so it is essential that the surface regularity of flatness conforms to or exceeds BS 8204.2:2002 class SR2 (+/- 5mm under a 2 metre straight edge). Any deviation from this may require a cementitious screed/repair mortar which must be suitable to receive a Polyurethane overlay.
Variable porosity and profile of the substrate will affect both coverage rates and final appearance.

Substrate Preparation

Surface preparation is the most vital aspect of resin flooring application. Inadequate preparation will lead to loss of adhesion and failure. The substrate in question will dictate the method of preparation. In the case of a concrete floor, preparation by dust enclosed diamond floor grinder may be appropriate, or if of a sufficient area for economic reasons, should be lightly shot blasted to leave a textured surface free from contamination.

If the floor has been treated with a cementitious surface improver, then the surface should be prepared in accordance with the manufacturer's recommendations, or abraded with an STR machine followed by thorough vacuuming.

Treatment of local repairs such as cracks and holes, improvement or modification of levels and removal of high spots, should be undertaken prior to the flooring installation.

A mechanical rebate should be formed around the perimeter of the installation to avoid weakness at the most vulnerable zones, evenly distributing loads and stresses and preventing ingress of aggressive media to the subfloor and bond line. A chase should be provided at all peripheral edges, parallel to expansion joints, at thresholds, feather edges, at free edges of a cove, where dissimilar flooring materials join and at day joints. This is normally formed by casting a chase when the concrete is laid or by cutting using a wet cut concrete saw.

The preferred dimensions of the rebate are twice the thickness of the screed in depth and twice the thickness of the screed in width.

Anchorage rebates should be provided as close to the perimeter as is practicable.

Please consult Altro or FeRFA's Guide to the Specification and Application of Synthetic Resin Flooring for further guidance.

Planning

Before proceeding with the installation, careful consideration should determine the best way of installing the Altro system. Efforts should be made to minimise day joints and optimise the open time of the product (i.e. minimise the distance between mixing and laying).

It is best to also consider the effect of external influences on the final installation (i.e. direction of light from windows etc.). Time spent at this stage will be invaluable towards the success of your installation.

The AltroFlow PUM floor system is designed to be laid at a nominal 2 or 4 mm thickness. Altro recommend that stainless steel mixing, laying and application tools are used in this process. Metal transfer from mild steel tools may result in discolouration of lighter colours which will be unacceptable to your customer. Please contact Altro for further guidance.

Application

The following application guide is based on laboratory and simulated site conditions. However, when installations conditions differ appreciably from those detailed by Altro, the performance characteristics of both mixing and laying may not be as expected. To achieve the best results at all times please endeavour to establish the correct conditions which in turn will allow the materials to be laid effectively, and meet your customer's expectations.

Installation Conditions

Apply in well ventilated areas. Both the slab and air temperature should be between 10°C or up to 25°C.

It is not advisable to mix and lay Polyurethane resin products outside the range 10°C to 25°C. Ambient conditions should be maintained at least 3°C above dew point or below 75% R.H. during the initial stages of cure. At site temperatures below 10°C cure times will be substantially increased unless some form of external heating is used. It must be recognised that the concrete slab temperature will generally be lower than the air temperature, often as much as 10°C, and this will govern the rate of cure. As the resin flooring cures, in condensing conditions moisture vapour may condense onto the surface and cause 'blooming', a permanent clouding of the surface.

Cold substrates can give rise to pinholes through the uncured resin. In unheated areas raise the substrate temperature prior to application and maintain the temperature of the substrate during application.

Mixing Equipment

- Slow Speed Drill (200-500rpm), such as MM17 *
- Mixing paddle, such as MR3
- Mega Mixer MM22 with MR3 Paddle
- Stainless mixing vessel, such as RM65 drum *

* All tool number references relate to Refina Ltd 01202 632 270

Priming the Substrate

In order to achieve a uniform finish, prevent bubbles and maximise substrate adhesion, primer should be used.
An Altro primer should be selected which is suited to the installation, and appropriate for the nature and moisture content of the substrate (seek further guidance from Altro).
For flow systems Altro Consolidating Primer™ is recommended as it is low in viscosity and able to penetrate the surface of the slab.
For substrates with greater than 75% RH BS 8203:1996 an effective DPM should be laid such as AltroProof.
If AltroProof™ DPM is used this may be installed instead of Altro Consolidating primer.
The appropriate Altro primer should be applied in accordance with the Product Datasheet.
Do NOT seed the primer with aggregate, experience shows that this can lead to pinholes from entrapped air.
Ensure that the substrate is well sealed, check for pinholes and areas of under-thickness and address before proceeding to install the system.
If the over-coating time period for the primer is exceeded, the surface should be lightly abraded and vacuumed before further coats are applied.

Product Installation

Decant all the base hardener and colour pack into a tall mixing vessel and mix thoroughly using a slow speed drill and whisk for 30 seconds.
The aggregate should be added gradually into the pre-mixed binder, whilst continuing the mixing action, and mix for a further 2-3 minutes. Ideally a timer should be used to provide mixing consistency. Excessively vigorous mixing should 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. If the mixing area is not adjacent to the laying area the time required to transfer the mixed material will reduce the open installation time.
Do not leave the product in the mixing vessel; apply to the floor as soon as possible.
Remember to always use the correct PPE.

Note: Double mixes are not recommended as the heat generated will reduce the working time of the product. If capacity is required then increase the number of mixing machines/stations on site. Ensure extraction is in place to remove airborne dust when adding aggregate.

Decant all of the contents of the mixing vessel onto the floor and spread to the desired depth using a clean stainless steel trowel or a pin rake set at the desired depth. Immediately spike roller the area until uniform.
Always set out the area to be laid in order that a wet edge can be maintained between each gauge.
Ensure the surface and the line of each gauge is uniformly spiked rollered but DO NOT EXCEED 15 minutes.
Always abut each gauge within 15 minutes of each other ideally in 5 metre wide bays. Care should be taken to ensure the mixing vessel is kept free of any build up of contaminants which could fall off and contaminate the floor.

Note: Ambient and slab temperatures will dramatically affect the application and working time of this product. Storage of the material units are also critical to the laying performance and should be equilibrated to the installation environment before use.

Coving Detail

All coving detail where chemical resistance is required should be installed using the AltroCove™ PU Product, which is specifically designed to be used in conjunction with the AltroCrete™ PU screed products. This product complements the floor but does not have the same appearance as the floor system. This should be identified to the end user.

Joints

The spacing of movement joints must be determined by the design of the subfloor. All live movement joints in the subfloor must be continued through the resin flooring. In all instances the type and positioning of movement joints should be agreed at the design stage between all parties concerned. Please refer to Altro or FeRFA's Guide to the Specification and Application of Synthetic Resin Systems for further guidance.
All joints should be filled with AltroExpand™ flexible jointing compound. Please see AltroExpand Datasheet for further information.

Protection

Whilst of an extremely durable nature these floor systems must by thoroughly protected from the rigours and abuse that exist during the ongoing contractual works.
The resin floor should reach full chemical cure in 7 days at 20°C. Untreated felt paper will suffice as protection from light traffic, however if protection is required from other trades then the following protection option should be considered.
Where heavier access is required then a more suitable medium to take the loadings, such as shuttering ply or Correx by Cordek, should be placed on top of the untreated felt paper. The resin system should have cured for 48 hours prior to placing the protection. No polyethylene sheets, linseed-treated hardboard, print or dyed card should be placed in contact with the resin surface.
All joints in the protection medium should be taped, and all accidental spillages should be recovered immediately by removal and reinstatement of the protection. Damage will occur to the system if ignored.

Cleaning (during installation)

All tools and equipment should be regularly cleaned using AltroSolve™ PU to reduce build up and maintain the quality of the installation. Ensure that the correct PPE is worn at all times.
Do NOT use AltroSolve™ EP.

Disposal

Due diligence must be adopted if accidental spillages occur. Recover using inert absorbent granules, transferring into a suitably marked container. Disposal of all empty containers and accidental spillages should be in accordance with the local waste disposal authority.

Cleaning Guidance

Optimum slip resistance can only be maintained with regular cleaning.
The texture of the surface will require mechanised cleaning using the blue Altro Unipad™ or a long-handled scrubbing brush. Mop cleaning will not be effective. Steam cleaners and/or hot pressure cleaners should not be used on the floor or walls. A cold/ambient pressure washer may be used if required, but the pressure should not exceed 1400psi. Warm water will offer improved cleaning, but the water temperature should not exceed 60°C.

- Sweep or vacuum the floor to remove debris
- For normal cleaning, dilute an alkaline detergent such, as AltroClean™ 44 or similar, by 1:40 in clean water
- Alternatively, dilute by 1:20 for infrequent heavy cleaning
- Liberally apply the water and detergent solution to the floor, scrubbing with a deck scrubber or slow-speed (< 400rpm) scrubbing machine fitted with an Altro UniPad or similar
- Pay particular attention to areas where residues may accumulate, such as internal corners of perimeter coves and around columns etc.
- If possible, allow the detergent solution to remain on the floor for several minutes to break down deposits, but not sufficiently long to allow the solution to evaporate
- Remove the solution by wet vacuum recovery and follow this with a fresh water rinse, or rinse the solution into drains if permissible
- It is important that all detergent residues are removed from the textured surface of the floor. Detergent may become slippery which affects safety, or sticky which attracts and holds more dirt

Altroclean 44 and Altro Unipads are available through the Resins Sales Desk.
Please obtain the correct Material Safety Data Sheets from Altro prior to beginning the installation.

To Order E-mail ResinSalesDesk@altro.com
Call 01300 320620
Fax 01300 321122

For further information or technical advice
tel: **01462 707600** fax: **01462 707515**
email: **enquiries@altro.com** or explore **www.altro.com**