

Altro Flow™ 3mm static-dissipative

Static-dissipative flow applied epoxy flooring
Technical and installation data sheet

Product description FeRFA type 5

Altro Flow 3mm static-dissipative is a three component, epoxy based material designed for in situ application. It provides a smooth, hygienic, seamless surface with static dissipative properties. Static build up is prevented by allowing the charge to harmlessly dissipate through the floor at a controlled rate.

Many industrial processes will create stray static electrical charges. In areas where damage to equipment might result from electrostatic accumulation, or prevention of an accumulation generated by the movement or processing of powders and liquids is required, there will be the need for static controlled floors.

N.B. Altro Flow 3mm static-dissipative is not a fully conductive floor. It should not be used in areas of intrinsic safety where spontaneous release of static charge might cause an explosion, such as with gasses, flammable liquids, munitions or pyrotechnics.

Standard colours

Altro Flow 3mm static-dissipative is available in a range of 25 standard colours. In common with other epoxy products lighter colours will be prone to unsightly cosmetic yellowing on exposure to strong light sources including sunlight.

Typical areas of use

- Powder production areas
- Clean rooms
- Dry storage areas
- Plant Rooms
- Laboratories
- Warehouses
- Control rooms
- ICT areas and electronic assembly

Advantages

- Ease of installation
- Ease of cleaning
- Good chemical and stain resistance
- Fully bonded to the substrate
- Excellent decontamination
- Provides seamless floor finish (substrate joints must be cut through)

Sustainability

Altro's 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

Altro Flow 3mm static-dissipative offers resistance to a range of commonly used chemicals. However, premature or prolonged 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	We do not recommend Altro Flow 3mm static-dissipative where there is risk of a slip
Usable working life	30 minutes @ 20°C
Speed of cure	Light foot traffic - 48 hours at 20°C Full cure – 7 days at 20°C
Bond strength EN 4264	B3,5

Packaging

Altro Prime static-dissipative is available in a 5kg two-part composite pack.

Altro conductive aggregate is available in 25kg bags.

Altro Flow 3mm static-dissipative is available in a 20 kg, three-part composite pack.

Coverage

The use of copper tape may be required to aid dissipation of electrical charges to earth and are installed prior to the application of the Altro Prime static-dissipative.

Altro Prime static-dissipative 24m² per 5 kg unit

Altro conductive aggregate 17m² per 25 kg bag

Altro Flow 3mm static-dissipative 4.2m² per 20 kg unit

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.

We cannot guarantee batch matches between different batches of aggregate. Necessary transitions between batches should be planned for non-conspicuous areas.

Selection and testing of Altro Flow 3mm static-dissipative

There is currently no single British Standard that is universally applicable to all industries and all requirements for static controlled flooring. Therefore, the electrical properties, test method and test agency (contractor, client or third party) should be agreed with the end user and discussed with the product installer at the tendering stage. Altro Flow 3mm static-dissipative has been measured in accordance with the test method laid out in EN1081:2018+A1:2020 The test method is intended to evaluate the electrical resistance of a floor covering under standard laboratory conditions.

Both 14041:2004 & EN 14041:2018 give no lower limit for a product to be determined as static dissipative or conductive, as such a product which meets the requirements to be considered conductive, would also meet the requirements to be considered conductive static dissipative.

Typical Test installation values – $\leq 10^6 \Omega^a$ - $\leq 10^9 \Omega^a$

In some installations 'earth leakage' (surface of the resin to earth) testing will be required and will necessitate the application of the Altro Flow 3mm static-dissipative over a copper grid set out on a flat floor, (see below). It is the installer's responsibility to ensure that this grid is installed correctly and is tested to ensure that it is fully earthed prior to the installation of the resin system. In situ testing of the installed resin system should only take place after it has been thoroughly washed and ideally trafficked for up to 2 weeks.

The test agency to carry out the testing should be agreed before the resin flooring is installed. It is recommended to lay a trial area of the Altro Flow 3mm static-dissipative preferably 4 -10 m², at the beginning of the contract. This will enable all parties involved to agree on the appearance and testing of the floor before the work progresses too far. Where possible the exact range of acceptable resistance, test method (including test voltage) and any specific charge requirements should be specified by the end user before selection of the resin flooring. For further guidance on test methods please refer to FeRFA guidance note: Static controlled flooring.

Performance testing (resistivity)

Once laid and chemically cured, the system must be trafficked and cleaned in accordance with our recommendations. At least 7 to 12 days must have elapsed and full trafficking and cleaning carried out before test readings are taken.

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 temperature in the aggregate will adversely affect the product application. Excessively high and low storage temperatures will affect the laying performance of the product.

Suitable substrates

Altro Flow 3mm static-dissipative may be applied to a variety of substrates including, but not limited to, concrete, polymer modified cementitious screeds, terrazzo, 25mm marine 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 Hemihydrate 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. The substrates should achieve 26N/mm² compressive strength (BS EN 12504-2) and surface tensile strength 1.5N/mm² (BS EN 13892-8). Substrates must include an effective damp proof membrane and contain residual moisture not greater than 5% by weight (75% R.H.) to BS 8203. 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 class SR2 (+/- 5mm under a 2 metre straight edge). Any deviation from this may require a surface improver to be applied which must be suitable to receive an epoxy resin overlay.

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

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. Application onto cold substrates can give rise to pinholes in the finished system if the ambient temperature rises during application causing micro pockets of air in the concrete substrate to expand and be displaced through the resin. Ambient and substrate temperatures should be raised prior to installation, and kept constant during application. Please consult Altro or FeRFA's Guide to the Specification and Application of Synthetic Resin Flooring for further guidance.

Earthing using copper tapes

It is highly advisable to apply Altro Flow 3mm static-dissipative over a grid of copper tapes to ensure that the installed resin floor is effectively earthed. This is achieved by the use of self-adhesive Altro static-dissipative copper tape applied to the substrate (below the first conductive layer) and connected to earthing points installed in a suitable location by the end user's electrical contractor. Every floor should have at least one earth linkage. However, it is good practice to install more than one connection as insurance should one be damaged. The number of connections should increase with the area of the floor and connections at each corner should be considered. A multi strand piece of copper wire connected to earth at one end and fanned out across the floor can be used under a cross hatch grid of copper tape to maximise the contact and connection to the earth linkage.

On ground concrete, a minimum of an earthed perimeter strip of copper continuity tape should be installed and tested before installation. On insulated subfloors, a grid of earthed copper tape must be provided and laid at four metre centres. Care should be taken to ensure that all sections of the floor are linked together i.e. expansion joints bridged with copper tape to provide electrical conductivity.

The concrete should be locally primed beneath the copper tape to prevent loss of bond with dust under the tape. If the copper tape is not properly adhered then air bubbles can escape through the subsequent flow coating. The electrical conductivity of the copper tape network should be verified before application of the primer.

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 Altro Flow 3mm static-dissipative floor system is designed to be laid at a maximum 3mm 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 installation 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 and 25°C. It is not advisable to mix and lay epoxy resin products outside of this range. 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, wet or humid conditions, and limited air-flow, can result in condensation on the part cured floor. The workability, open time, cure development and return to traffic will be significantly affected by ambient conditions. Do not lay the Altro Flow 3mm static-dissipative variant on a raising thermometer as this can give rise to pinholes. 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 some cases an unmodified non-conducting Altro Prime will be required to maximise adhesion to the concrete or to act as a damp proof membrane. Such a primer will act as an insulating layer making the use of copper tape described above essential. For substrates with greater than 75% RH (BS 8203) an effective DPM should be laid such as Altro Proof standard. The appropriate Altro primer should be applied in accordance with the product data sheet.

Ensure that the substrate is well sealed and that all hungry areas are addressed 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. Altro Prime static-dissipative should be applied prior to the installation of the Altro Flow 3mm static-dissipative and after the use of any copper tape. Altro Prime static-dissipative should be fully blinded with Altro conductive aggregate while the system is still wet.

Product installation

Altro Prime static-dissipative - use a drill and mixing paddle. Pour all of the hardener into the base and mix for 2 minutes. Excessively vigorous mixing should be avoided as this can lead to undesirable air entrainment. 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. Remember to always use the correct PPE. Pour all the mixed material into either a large roller tray, or lay a river of the material onto the prepared substrate. Using either a low-loss medium pile synthetic roller, or dense foam rubber squeegee, distribute the material evenly and uniformly to fully treat the surface. Finish using a roller to ensure that a uniform and even coverage is achieved. While the primer is still wet fully blind the system with Altro conductive aggregate and allow to cure. When cured vacuum away the excess aggregate prior to application of the Altro Flow 3mm static-dissipative.

Altro Flow 3mm static-dissipative - take the hardener component and fully disperse the carbon fibres that are contained within it. Ensure that they are scraped from the sides and bottom of the bucket and use a drill and paddle if necessary. The carbon fibres are an essential component. Using a slow speed drill and paddle thoroughly mix together the base colour for 30 seconds. Pour all the mixed base and hardener contents into a suitable clean mixing vessel and mix for a further 90 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. 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. **Remember to always use the correct PPE.**

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. Spike roller the area immediately, NOT beyond 20 minutes @ 20°C. Do not exceed this time between gauges. 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.

Joins

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 Altro Expand flexible jointing compound. Please see Altro Expand data sheet for further information.

Protection

Whilst of an extremely durable nature these floor systems must be 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, 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 at least 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 the guidance is not followed.

Cleaning (during installation)

All tools and equipment should be regularly cleaned using Altro Solve™ EP to reduce build up and maintain the quality of the installation. **Ensure that the correct PPE is worn at all times.**

Disposal

Due diligence must be adopted if accidental spillages occur. Recover using 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. Resin floors require mechanical cleaning, mop cleaning will be less effective but may be sufficient for routine maintenance of floors with a smooth surface.

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 Altro Clean 44 or similar, by 1:40 in clean water
- Alternatively, dilute by 1:10 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 and 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 residue is removed from the textured surface of the floor. Detergent may become slippery which affects safety, or sticky which attracts and holds more dirt

Altro Clean 44 and Altro Unipads are available through Resins Sales Desk.

Please obtain the correct safety data sheets from Altro prior to beginning the installation.

To order E-mail ResinSalesDesk@altro.com

Call 01300 320620

Fax 01300 321122

NOTE: "Altro Limited" ("Altro") endeavours to ensure that advice and information given in Product Data Sheets, Method Statements and Material Safety Data Sheets (all known as Product Literature) is accurate and correct. However, where Altro has no control over the selection of its products for particular applications, it is important that any prospective customer, user or specifier, satisfies him/herself that the product is suitable for the intended application. In this process, due regard should be taken of the nature and composition of the background/base and the ambient conditions both at the time of laying/applying/installing/curing of the material and when the completed work is to be brought into use. However, as site conditions and the execution of the work are beyond our control, we accept no resultant liability.

Altro's policy is one of continuous research and development and we reserve the right to update our products and information at any time without prior notice.

For further information or technical advice

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