

August 1996
APPLICATION DETAILS



ARDURIT X7

THIN OR THICK BED ADHESIVE FOR INTERNAL AND EXTERNAL USE

APPLICATION & FIXING GUIDE

GENERAL INFORMATION

Ardurit X7 is a cement-based powder and water mixed adhesive which is available in grey or white. On mixing a whole 22kg bag of powder more than 16 litres of mortar is obtained. The mortar produced has good gap filling properties enabling it to be used for both thin and thick bed applications on dry or moist substrates. When used in lieu of cement/sand it gives a thinner bed thickness and considerably reduces fixing time due to ease and speed of work. The mortar has high initial grab and slump resistant properties enabling heavy tiles to be fixed, thus reducing or dispensing with the need for battens and spacers. The mortar hardens rapidly after setting and when used for fixing floor tiles, the area can be subjected to light foot traffic after 24 hours has elapsed and to full loads after 3 days, at normal temperatures (20°C).

Ardurit X7 can be used with Ardion 90 mortar admix to produce a mortar with elastic and water repellent properties (see Ardion 90 product data sheet). The use of Ardion 90 mortar admix is especially effective when fixing large flat-backed tiles and slabs as well as smooth backed, dense impervious ceramics, vitreous mosaics etc; fixing of ceramic tiles on existing glazed surfaces; fixing tiles in bathrooms and showers etc. to give improved protection to moisture sensitive backings; fixing external tiling to inhibit the formation of lime bloom and efflorescence.

As it is unaffected by frost, water and weather, it is extensively used for external tiling, swimming pools and surrounds, showers and similar applications. Ardurit X7 has been tested for resistance to freeze/thaw cycling down to -60°C and water immersion; these tests revealed no decrease in hardness of the mortar or its adhesive strength. These qualities enable Ardurit X7 to be used to fix insulation materials to concrete or brick walls in cold stores and similar environments.

British Standard Codes of Practice

The following British Standard Codes of Practice referred to overleaf are:

BS 5385: Wall and Floor Tiling

- : Part 1 : Code of Practice for the design and installation of internal ceramic and natural stone wall tiling and mosaics in normal conditions.
- : Part 2 : Code of Practice for the design and installation of external ceramic wall tiling and mosaics.
- : Part 3 : Code of Practice for the design and installation of ceramic floor tiles and mosaics.
- : Part 4 : Code of Practice for ceramic tiling and mosaics in specific conditions.
- : Part 5 : Code of Practice for the design and installation of terrazzo tile and slab, natural stone and composition block flooring.

BS 8000 : Workmanship on Building Sites

- : Part 11 : Code of Practice for wall and floor tiling.
- : Section 11.1 : ceramic tiles, terrazzo tiles and mosaics.
- : Section 11.2 : natural stone tiles.

Ardurit X7 conforms to BS 5980 : 1980 as a Type 1 Class AA adhesive and to DIN 18 156-M as an adhesive mortar and designated Class A1 for non-combustible construction materials according to DIN 4102. Test Certificate No. PA-111 4. 53.

APPLICATION

As tiles are intended for use in permanent installations, careful consideration must be given to the suitability and preparation of the substrates.

Reference should be made to the relevant parts of British Standard Code of Practice BS 5385: Parts 1, 2, 3, 4 and 5 regarding the correct installation of various backgrounds, their required drying out periods and any additional work or preparation required prior to fixing ceramic tiles.

Ceramic tiling is essentially a rigid coating and it is therefore necessary to provide a rigid substrate. In this context the dimensional stability of the substrate must remain within the limits tolerated by the tiling under all conditions likely to be encountered. This is particularly important in external situations where direct fixing to a stable, weather resistant substrate is recommended. Consideration must also be given to the behaviour of the substrate, subsequent to being covered by a virtually impervious ceramic coating, as under these new conditions, if subsequently wetted, the drying out will be extended and the prolonged contact with the moisture can deteriorate some substrates. The substrate must be carefully examined to ascertain the soundness of the surface. Any loose surface deposits, dust, dirt, release agents and other contaminating materials must be removed. The strength of the substrate must also be sufficient to carry the additional load of tiles and adhesive bed.

Any structural joints in the substrate must be carried through the adhesive and tile bed. In addition, movement joints must be incorporated in large areas of tiling as specified in the relevant part of BS 5385. In some applications the sub-structure is subject to drying shrinkage and, in these situations, tiling should commence when most of the shrinkage has taken place. Thus with new concrete it is usual to allow a few months to elapse, extending the time in cold conditions, prior to tiling.

SUBSTRATE PREPARATION

The preparation of different substrates varies, in some cases a priming coat is necessary, in others mechanical roughening to provide a key, whilst for surfaces such as concrete, cement/sand and similar materials no preparation, other than cleaning, is required. Details of preparation work recommended for some surfaces are given below. These are intended for general guidance and for specific application, greater detail may be obtained by contacting our technical staff at Haverhill. Further information is also contained in the Product Data sheets on Ardurit X7 and Priming and Preparation. Consideration should also be given to the flatness and surface regularity of the new backgrounds prior to fixing the tiling. Where an adhesive fixing technique is used, the gap behind a 2m straight edge should not exceed 3mm, Clause 2.2.12.2 of BS 8000 : Section 11.1.

Concrete

This includes precast, in-situ, granolithic and power floated concrete. This material exhibits drying shrinkage, however most of this has taken place after six to twelve weeks as previously mentioned and it provides an excellent base for tiling using Ardurit X7. If any surface laitance, mould oil and other materials are present, they should be removed from the surface prior to tiling, but there is no necessity to mechanically roughen the surface to provide a key.

Cement/Sand

This material is also an excellent base for bedding tiles with Ardurit X7 and is the most satisfactory substrate material, other than concrete, for use in intermittently or permanently wet situations. New cement/sand screeds and renders should be finished with a wood float to the required surface regularity (flatness). Allow render surfaces to cure for a day or two by

preventing rapid surface drying and then let the surface air dry for at least 2 weeks prior to tiling. With new cement and sand screeds a drying time of at least 3 weeks is recommended in BS 5385 : Part 3.

Brickwork

Due to its gap filling properties, Ardurit X7 can be used on brickwork to adhere tiles, insulation boards, etc., without the requirements of a cement/sand render. In applications onto a sound brick surface Ardurit X7 may be applied up to 10mm bed thickness and greater over small areas to obtain a level bed. Brickwork with low strength characteristics will require a cement/sand render through anchored reinforcement, prior to tiling, to distribute the loading into the body of the brickwork. Do not fix directly to brickwork containing high levels of soluble sulphates in external or wet locations.

Blockwork

All types of blockwork can be tiled using Ardurit X7, however certain factors must be considered. Movement will occur for a month or so after construction as a result of mortar shrinkage in the joints, drying shrinkage of the blocks and possible settlement, therefore adequate time should be allowed for most of this movement to take place prior to tiling. Naturally the strength of the surface of the blockwork should be adequate to support the weight of tiling and the blockwork and joints should be flush to provide a level surface for tiling. Aerated concrete blocks should be considered for internal tiling only.

Gypsum Plaster

This material is moisture sensitive and therefore must not be used as a substrate, either in internal situations where it will become damp, or in external situations. In such cases a cement and sand render should replace gypsum plaster as the substrate material. The plaster must be dry and have been completed for at least four weeks (longer in cold or poorly ventilated conditions) prior to the fixing of tiles. In all situations the plaster must be sufficiently strong and well adhered to the wall to support the tiling. Ensure that the plaster surface is not overworked (polished or water-flashed) since the smooth finish produced has a weak and dusty surface. Brush down the surface with a stiff brush (or fine wire brush on a water-flashed surface) prior to priming with Ardion 51, diluted one part to three parts water and allow to dry. The tiles, which should not be heavier than 20kg/m² (generally equivalent to ceramic tiles with a thickness of 8mm or natural stone tiles with a thickness of 7mm), can be fixed using a thin bed fixing technique onto the dry, primed plaster surface.

Plasterboard and other Paper-faced Boards

Providing these boards are firmly and rigidly fixed to adequately support the tile bed without any subsequent distortion, fixing of tiles using Ardurit X7 can be carried out directly onto the surface. The 'wet strength' of paper-facing is normally adequate for thin bed fixing of tiles that weigh up to 32kg/m² (generally equivalent to tiles with a thickness of 12.5mm or natural stone tiles with a thickness of 10mm) and priming is not usually necessary.

Existing Glazed or Smooth Impervious Surfaces

These include existing glazed and unglazed tiles, mosaics, quarry tiles, terrazzo, etc. The existing surface should be thoroughly cleaned to remove all traces of grime, grease and other surface contamination that would impair adhesion. The use of a scouring pad in combination with cleaning agents is recommended. The surface should be rinsed down and allowed to dry. Providing the resulting surface is sound and clean, the tiles can be directly fixed using Ardurit X7, incorporating Ardion 90 mortar admix. An alternative method in internal locations, unlikely to be saturated with water, is to prime the clean surface with Ardion 82 primer prior to fixing the tiles in Ardurit X7.

Asphalt

Internal hot laid asphalt, of grades sufficiently hard so as not to deform under anticipated loads during use, can best be tiled using Ardurit X7 incorporating Ardion 90 mortar admix, providing the surface has a clean, well-adhered sand key. Smooth or inadequately sanded asphalt must be primed with Ardion 82 primer. See "Fixing Ceramic Tiles to Internal Asphalt Floors" leaflet for full details. For external applications please consult our Technical Services Department at Haverhill or see the advisory note "Tiling to External Asphalt".

Wood and Wood-based Sheets and Boards

The use of wood or wood-based sheets and boards, that are subject to moisture movement, as backgrounds for ceramic tiling should be avoided if at all possible since they will not be compatible with a rigid ceramic tile bed. If such sheets and boards have to be used they should be restricted to small areas in dry internal locations, since it is difficult to ensure complete protection against atmospheric humidity and, as recommended in BS 5385 : Part 1 : 1995, the tiles should not bridge joints between the sheets and boards. The sheets and boards should be dry and should be rigidly fixed and adequately braced against movement. Fixing to frames and battens should be with screws or ring nails, ensuring the frames and battens are ventilated. Any sheets and boards should have their backs and edges sealed to prevent ingress of moisture and atmospheric humidity, sealing the face to be tiled with Ardion 82 primer prior to fixing the tiles in Ardurit X7, incorporating Ardion 90 mortar admix. With suspended timber floors refer to our design data leaflet "Fixing Ceramic Tiles to Suspended Timber Floors".

Painted Surfaces

These vary considerably in composition and behaviour. Any flaking, weakly adhered or water sensitive paint should be mechanically removed to expose a sound substrate. If the paint appears to be sound and well adhered, a test area should be applied using either Ardurit X7 incorporating Ardion 90 mortar admix, or Ardion 82 primer and Ardurit X7, to establish suitability. It must be remembered that some paints, especially oil based paints, will change their characteristics once covered, the initial adequate adhesion deteriorating with time. If this is the case, the paint should be mechanically removed to expose a sound and stable base for tiling, proceeding as described for the exposed backing material.

Underfloor Heating

Ardurit X7 is suitable for fixing ceramic tiles onto concrete or cement and sand screeds with sub-floor heating. It is advisable to incorporate Ardion 90 mortar admix in the Ardurit X7 to inhibit the passage of water through the tile bed and the propagation of any cracks in the base through the tile bed. The use of Ardion 101 grout admix in either the appropriate Ardurit cement-based grout or cement/sand grout is advised.

With existing heated screeds, cool down to room temperature, clean and prepare the surface, then fix and grout the tiles as described above. Allow at least 24 hours after completion of tiling prior to gradually bringing the heated sub-floor back to operating temperatures (5°C per day).

With new heated sub-floors the time periods between various stages of construction and the rate of initial heating and cooling prior to and subsequent to tiling can be obtained by contacting our Technical Services Department at Haverhill.

MIXING

Ardurit X7 powder is added to water in a clean container whilst stirring and mixed thoroughly to give a soft, slump-free, easily worked mortar. The mix proportions by volume are:-

Approximately 2 1/2 parts Ardurit X7 powder: 1 part water
(A 22kg bag of Ardurit X7 requires approximately 6 1/2 litres of water).

The consistency can be adjusted to suit site conditions and the materials being fixed, but must always be slump free. The pot life of the mixed mortar is approximately 5 hours at normal temperatures.

With Ardurit X7, 4kg of Ardion 90 admix, diluted with 4 litres of water, is sufficient for a 22kg bag. Dilute the Ardion 90 with an equal volume of clean tap water. Add the Ardurit powder to the diluted Ardion 90 whilst stirring thoroughly until an easily worked mortar is obtained. The viscosity and slump resistance of the mortar can be adjusted by slightly increasing, or reducing the amount of water to suit site conditions and the materials being fixed.

The mortar should be applied at temperatures above 5°C.

FIXING TECHNIQUE

For fixing ceramic tiles or mosaics the Ardurit X7 mortar is applied to the prepared substrate with a trowel to give a bed thickness of 2 to 3mm on a level surface. Use a notched trowel to give a ribbed mortar bed on the substrate. The tile being fixed must be pressed firmly into the freshly combed mortar bed and thoroughly bedded in whilst the mortar is moist and soft, care being taken to ensure good contact throughout. Tiles with ribbed or keyed back profiles should also be buttered so that the voids are filled. The position of the tiles can be adjusted for some 10 minutes after initial fixing. The open time of the combed mortar bed is approximately 20 minutes, depending on background materials and site conditions.

Use notched trowels with 3mm x 3mm square notches at 6mm centres for mosaics and small, thin, flat-backed wall tiles, 5mm x 5mm square notches at 10mm centres for general wall tiles and 8mm x 8mm square notches at 16mm centres for floor tiling. In addition, it is recommended that all tiles to be fixed on floors, or in external situations, or in situations where damp conditions may prevail after tiling, should also be buttered to ensure solid bed fixing.

Strong and sound rigid surfaces, e.g. brickwork and blockwork, that are rough or uneven may first be levelled with a bed of Ardurit X7 mortar which, when sufficiently firm, is followed by an application of the normal bed of 2 to 3mm thickness. Alternatively, given adequate skill, these two separate operations may be combined in a single thick bed application.

When fixing ceramic tiles, the coverage depends on the back profile, e.g.:-

flat backed	12 -15m ² /22kg bag
lightly keyed	10 -13m ² /22kg bag
deep keyed or stud backed	4 - 7m ² /22kg bag

Although the advice given on the use of Ardurit X7 in this leaflet refers mainly to ceramic tiling, this product is also suitable for fixing to a wide range of materials used in the building industry; examples include lightweight rigid foam insulation boards (polystyrene, polyurethane, etc.), brick slips, marble, stone, and concrete slabs, etc.

GROUTING

Grouting may proceed as soon as the tile bed is sufficiently firm, i.e. usually 24 hours at room temperature. This period however will be extended in cold conditions, whilst in swimming pool tiling, 3 days should be allowed.

We recommend the use of Ardurit F4 cement-based grout for wall tile joints up to 3mm wide. Use Ardurit C2 or Ardurit GK cement-based grouts for normal floor and wall tile joints. Where the tile joints need to be chemically resistant, tough and impervious for reasons of hygiene, heavy traffic, etc., we recommend the Ardipox range of epoxide grouting compounds.

RECOMMENDED TROWEL NOTCH PATTERNS



3 x 3mm at 6mm centres for mosaic fixing - Pajarito Type 35



5 x 5mm at 10mm centres for wall tiling - Pajarito Type 26



8 x 8mm at 16mm centres for floor tiling - Pajarito Type 49

Note: The above blades are to be used with the Pajarito trowel handle - see tool catalogue for details.

ARDEX materials are also manufactured in Australia, Austria, Denmark, France, Germany, Saudi Arabia, U.S.A., and represented throughout the World.

NOTE: The information supplied in our literature or given by our employees is based upon extensive experience and, together with that supplied by our agents or distributors, is given in good faith in order to help you. Our Company policy is one of continuous Research and Development; we therefore reserve the right to update this information at any time without prior notice. We also guarantee the consistent high quality of our products; however, as we have no control over site conditions or the execution of the work, we accept no liability for any loss or damage which may arise as a result thereof.

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