

Instructions for Renovating Fibre-concrete Roofs

- Leaky Roofs:** Many roofs in this country, and of course throughout the world, suffer from porosity when they have aged. A 70 year old fibre-cement roof will have become porous, whether it is made of slate-like tiles or corrugated sheet. After testing the idea on a friend's roof, I used my expertise to develop Renov-8 and obtained a patent to cover its use in the marketplace.
- Economical:** My friend was delighted because I had repaired his leaky roof for a fraction of the cost of a new one! The actual tiles were the last thing he suspected of causing damp in the plaster of the walls, which was falling off despite everything he had done to prevent it. If your roof tiles are damp on the inside it is likely that the rain is just soaking through them! This happens as the roof tiles age, and it particularly affects houses made after the First World War (1920 onwards).
- Success:** The treatment was carried out in November so the drying out process was happening in the middle of winter. Despite this, the increasing appearance of dried salts over the next few months proved that the moisture that previously was permeating the tiles is being resisted, and is still working over 10 years later.
- Other Uses:** The process is also useful in treating old stone work where the stone has been attacked by acid rain and pollution. This can be seen on most lovely old buildings. So far the only solution is the very expensive replacement of the stone itself. The treatment costs just a fraction of this, and can be done really quickly. I find it incredible that it is not used to preserve our crumbling Victorian stone buildings.
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Renov-8:

According to the present invention there is provided a method of applying liquid chemicals to a porous roof with the aim of the chemicals saturating the body of the tiles before hardening to create an impervious barrier that can be expected to last for ten years or more, thus obviating the need for a new roof structure. The treatment is equally applicable to concrete and other roof surfaces, whether of slate, clay, concrete, fibre-cement or other tile material and to differing profiles, e.g. Roman, Pantile or plain, and may be applied to other absorbent roofing materials such as corrugated fibrocement sheeting or wood.

Suitable Chemicals:

Ideally use high VOC stabilising solution thinned with white spirit. This has been found to penetrate the material to be treated better than low VOC (PVA based) stabilisers thinned with water.

While in no way limiting the range of suitable chemicals it has been found that a mixture of one part of proprietary stabilizing solution to three parts of white spirit is effective in thinning the stabilising solution adequately to enable its absorption deep into the tile structure and render said solution sufficiently fluid to spray. Stabilising solution is an epoxy ester resin compound in a Naphtha petroleum base. White Spirit is also known as High Flash White Spirit or Stoddard solvent in the USA.

The most common variety of white spirit is a mixture of saturated aliphatic and alicyclic C7-C12 hydrocarbons with a content of 15-20% (by weight) of aromatic C7-C12 hydrocarbons and a boiling range of 130-230 C. The liquid is thin enough at this concentration to be sprayed from a typical garden spray, although more complex spray units may be used. The advantage of the lightweight, manually pumped garden spray lies in its simplicity and portability, enabling the liquid to be sprayed into virtually inaccessible areas. In general, the pressure generated is adequate to reach the apex of the roof from the gutter line. Thorough mixing of the solution is vital and should be undertaken in a separate mixing vessel prior to charging the reservoir of the spray unit. At low temperatures the stability of the solution is not dependable, and the solution in the spray reservoir may need to be agitated if being used at low temperature, e.g. in winter. The liquid may also be brushed on, generally using a mixture of one part stabilising solution to two parts white spirit, and generally towards the edges of the roof surface or in tight areas where spatter is not desired.

Other Chemical Options:

Other potential chemicals for treatment of certain types of roofing material include a water-thinnable, solvent free silicone and siloxane emulsion, a 1-10% texanol ester alcohol mixture, and a water-soluble polyvinyl acrylate solution although this list is by no means exclusive. Such compounds act more slowly; giving the highly aromatic solution first herein mentioned an advantage in terms of permeability and speed of application. However, it has been noted that an ideal treatment for a given tile may require layers of differing compounds for optimum water resistance and durability. For instance, a layer of polyvinyl acrylate over two layers of the above described mixture of stabilising solution and white spirit may increase the durability of the treatment over the long term. However, once the treatment shows signs of deteriorating with age, it is a simple enough matter to treat it once again, once more lengthening the life of the existing roof, with all the attendant benefits.

Preparation:

Access to the roof area is assumed, but due to the nature of the method the provision of access does not necessitate full scaffolding of the building, which is both costly and intrusive. The treatment may be achieved from a ladder or independent scaffold tower, although it has been found that a roof ladder is useful in preparing the tiles and for access to areas that are difficult to access such as those in the vicinity of dormer windows, chimneys etcetera. Given such access, using minimal equipment the treatment may be achieved. It is, however, necessary to use protective gloves and clothing, an effective face mask and goggles whenever dealing with chemicals and sprays.

Ideally, the surface of the tiled roof will be scraped or cleaned to remove foreign growth and dirt prior to the chemical application. This may be achieved in a number of known ways such as scraping, brushing or abrading with or without chemical detergents as determined by the specific roof. An application of fungicide may then be applied mixed one part of fungicide to two parts of water. However, these parts of the process are by no means essential, and ancient roofs with their flora need not be aesthetically undermined by the process. With suitable care, the chemicals may be applied in such a way that extraneous flora, algae etcetera may be retained without impairing the effect of the treatment. Any broken, loose or otherwise substandard tiles should be replaced. Any loose or substandard rendering or gaps in the rendering at the edges of the tiled surface or between tiles should be filled with an appropriate cement mix. Once the roof is prepared to the desired condition, the treatment may commence. Wherever possible, the roof should be dry, and application should not be attempted in poor weather as the liquid treatment can only penetrate as deeply as the porosity of the tile allows, and residual moisture will limit the depth of penetration. Likewise, rainfall between layers of the treatment will inhibit the effectiveness of said treatment, as will high wind which will make control of the spray difficult. Moreover, the environmental temperature should not be below 5 degrees Centigrade or the relative humidity above 80%.

Any areas requiring particular care such as skylights and flush windows should be masked with polythene sheet and secured with tape or similar. It is worth noting that the residue of the solution used in the treatment is clear and virtually undetectable except on glass, where it appears as a slightly tan translucent stain that is easily removable with solvent or a sharp edged scraper.

Application:

Once the treatment has begun by spraying along a section of the roof line, the roof pitch facing the operator should be treated in vertical strips, and each strip will typically comprise 3 to 4 metres, so that the roof surface of the strip being treated will be thoroughly wetted, working from side to side in 3 to 4 metre strokes. It will be found that the liquid begins to run off as the roof material reaches its limit of absorption, and spraying should be halted while the run-off is absorbed when nearing the lower portion of the roof, e.g. near the gutter line. The surface may then be completely treated by spray or brush. It should be noted that tiled roofs are generally laid with a significant overlapping section of each row of tiles covering a matching underlapping section of the next lowest tile or row of tiles, and treatment should be extended into these underlapping areas as far as possible. As a result, care should be taken to ensure that the treatment affects the underlying tiles, and the treatment should be directed towards the vertical and horizontal gaps between tiles in the roof surface. An hour should then be allowed before repeating the procedure. This is an approximate measure varied by the specific material, temperature and weather generally, making a balance between saturation of the material and hardening of the chemical treatment. In general, it is best for the treatment to be continued while the surface is still tacky.

It will be noticed that the rate of absorption is less than on the first coat, showing that the permeability of the tile is decreasing as desired. A third and subsequent coats may be applied, again allowing about an hour between coats, with a theoretical maximum of 16 hours between coats. It has been found that usually three coats are sufficient to completely permeate the tile material, although this varies with different tile formulations. When the operator is satisfied that the limit of absorption has been reached, the working platform should be moved to the centre of the next 3 to 4 metre section of roof, while the method is repeated. If at any stage the treated area begins to show a glossy finish rather than a matt finish, the treatment is already completed and further treatment should not be attempted. The treatment should be continued section by section until the roof side has been completely treated. Areas such as gables and dormers should be treated contemporaneously with the section of roof in which they are situated unless practical considerations dictate otherwise.

The other side of the roof pitch or other separate areas of roof tile such as single storey roofs can then be treated in the same fashion. While the above method has been applied exclusively to tiled roofs the treatment may be applied to other roof surfaces, but this depends upon the specific instance; for example the treatment should not be used over bituminous roofing felt, but could be applied to an otherwise untreated concrete roof slab or a fibrous corrugated roof construction.