



## 1. Replacement of nailed-down slates

The most frequent repair job on a slate roof is the replacement of a broken slate and its backing. This is most difficult to do on nailed-down slates.

If the slates are fixed with one nail in the head, all the slates immediately above the broken one are rotated on their nails.

1). If the slates are fixed with one nail in the head and two in the centre and the one to be replaced is below slates with one nail in the head, the two adjacent slates with one nail in the head which are above the one with two nails are rotated to make it accessible. If the slate to be replaced is below slates fixed with two nails, one of the two nails on those slates must be removed so that they can be rotated on the other. When all the slates are fixed with nails at the centre, the slate must be pulled off.

Then a pointed end hook with the clip open (unbent) must be driven in and the slate fitted over it. The hook must then be bent to hold the slate firmly by the tail.

Normally there is no problem with this, even though the replacement slate is held down only by a hook, because it is among slates held down by two nails, which means they are probably large, thick models.

## 2. Replacement of hook-fixed slates

When slates are held down by hooks they are easier to replace: the hooks are unbent so that the slate can be removed, and the new one is fitted by inserting a metal sheet to the point where it rests on the batten where the slate head must go and sliding the slate down it (so that it does not bump into the batten). The hook is then bent back to its normal shape so that it grips the slate tightly.

## 3. In-depth repairs

Nails eventually rust. Stainless steel hooks do not, but the shanks of galvanized and other steel hooks rust fairly quickly, because they are in contact with rainwater for a large part of the time. This is the area where hooks weaken and break most often.

If the hooks are broken but the slates are usable, they are carefully removed and cleaned with a vegetable or nylon bristle brush and tapped gently to check whether any are cracked and must therefore be discarded (good slates give a metallic ring and cracked ones a dull sound).

Any broken nail left on the battens which cannot be pulled out should be driven completely in, and any rotten wood should be replaced.

Small areas of rot on rafters can sometimes be repaired with dovetails or other inserts which ensure strength and safety. The old slates are then re-laid, with new ones replacing any breakages. If the slates are nailed down, not many can be re-used: most will either break when the nails are removed or have nail-holes worn too big to be serviceable.



New materials and technologies should not be discounted: used in due measure as more or less discreet auxiliary elements they may sometimes avoid the need for repairs or enable otherwise impossible partial repairs to be carried out. Polyester, for instance, is easy to handle, strong and perfectly mouldable: it is applied as a semi-liquid paste and can therefore reach into difficult spots. A catalyst can also be used to control how fast it dries. It is highly adhesive, resistant to acids and alkalis and accepts colorants, including black.

Polyester does, however, attack polystyrene, so it cannot be used if there is polyurethane insulation under the slates.



Repairs can also be an occasion for cleaning the roof, which looks less attractive when dirty.

#### 4. Cleanin of slate roofs

Slate roofs need to be cleaned: ash, smoke, dust and industrial waste on the one hand and moss, lichen, grass, etc. on the other may lead to a deterioration in their appearance. Also, dust and moisture create an environment where vegetation can grow, especially in shady areas.

Lichens, which are a mixture of fungus and alga, are highly resistant and adhere almost permanently to roofs. They can appear anywhere as a result of spores blown on the wind, or bird excrement, which in itself builds up to give an unsightly appearance.

Slates should be cleaned by first brushing and scraping them, then treating them with herbicide and fungicide. This should not, of course, be done during wet weather as the chemicals would be washed away.

We have mentioned lead as a useful ductile material for sealing of difficult shaped areas, but it must be noted that white/grey lead oxides can attach themselves to slates, where they are extremely difficult to remove.

It must also be taken into account that although slate cannot be penetrated by oil, its surface is rough and any oil which adheres to it is therefore difficult to remove. Care should be taken to prevent oily products contacting slates, and any traces which do adhere to them should be cleaned with trichloroethylene or perchloroethylene.