

**Disclaimer**

This sheet is intended for designers, specifiers and other members of construction project teams wishing to reuse this building material or product. It is part of a collection of sheets aimed at bringing together the available information to date that is likely to facilitate the reuse of building materials and products.

This sheet has been produced by Rotor vzw/asbl within the framework of the Interreg FCRBE project - Facilitating the Circulation of Reclaimed Building Elements, supported by the entire project partnership. Sources of information include the experience of reclamation dealers and involved project partners, lessons learned from exemplary projects, available technical documentation, etc.

The sheets have been produced between 2019 and 2021. As the reclamation sector is evolving, some information, notably regarding pricing and availability, may change over the time. When the text refers to European standards, it is up to the project team to refer, if necessary, to their national implementations and local specificities.

It is important to note that the information presented here is not exhaustive or intended to replace the expertise of professionals. Specific questions are always project related and should be treated as such.

The complete collection of sheets (including the introductory sheet) is freely available from different reference websites (a.o. opalis.eu, nweurope.eu/fcrbe, futureuse.co.uk).

Non-exhaustive directories of dealers in reclaimed building materials are available on www.opalis.eu and www.salvoweb.com.

Interreg FCRBE partnership: Bellastock (FR), the Belgian Building Research Institute / BBRI (BE), Brussels Environment (BE), the Scientific and Technical Center of Building / CSTB (FR), Confederation of Construction (BE), Rotor (BE), Salvo (UK) and University of Brighton (UK).

The information contained in this document does not necessarily reflect the position of all the FCRBE project partners nor that of the funding authorities.

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Material description

Slate is a metamorphic rock from the schist family. It is composed of a structure of horizontal layers and fine, hard grains. The use of this material for construction has been documented since at least the 12th century. Its properties make it a popular material:

→ *Fissionable*, slate has a good ability to split into thin and clean sheets, which facilitates their shaping into roofing elements (planimetry and thickness precision).

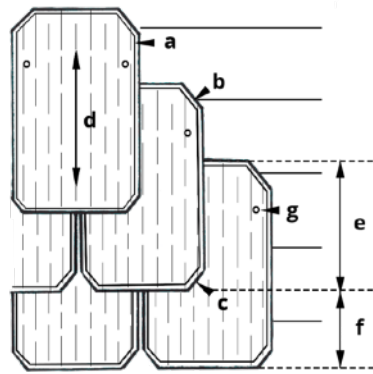
→ *Very slightly porous*, it is resistant to frost and weathering.

→ *“Flexible”*, it can be cut and drilled easily.

Natural slate has several uses in construction. It is most often found on roofs and for exterior cladding - which are the subject of this sheet. It is not uncommon to find it also available in the form of floor tiles, interior wall coverings, steps, etc. (these uses are not discussed here).

The roofing elements in natural slate (called “slates” in the remainder of the document) generally show excellent durability (reference lifespan of 100 years, or even up to 300 years for quality slates). Specialized craftsmen are able to ensure careful disassembly. In practice, the potential for reclamation depends on aspects such as the original quality of the slates (absence of natural defects), the quality of the original installation, good maintenance and resistance to meteorological and climatic factors likely to alter their properties.

Companies specializing in the reclamation and resale of slates are frequently located in regions which have (or had) a great tradition of exploiting this material: Wales, Scotland, Ardennes, Anjou, Corrèze, etc. Specific names characterize certain traditional models (i.e. “1st quarry”, “cartelettes”, “Princesses”, “Duchesses”, “Bangor Blue”, etc.). Models imported more recently from Spain, China, Canada or Brazil can also be found at



- a. Splinter = sizeable chamfer or bevel, on the visible face
- b. Shoulder = breaking of upper corners
- c. Deflection = breaking of lower corners
- d. Longrain = direction of schist crystals
- e. Cover = part covered with slate
- f. Margin = visible part of an installed slate
- g. Nail hole

Anatomy of a reclaimed natural slate tile. Rectangular model

certain suppliers. In general, the slates produced before the first half of the 20th century are generally thicker and have a rougher aspect than later slates. In any case, they should not be confused with artificial slates (asbestos-cement, fibre-cement, plastics) having a shorter lifespan (30 years) or with other covering stones (i.e. lava or lauzes).

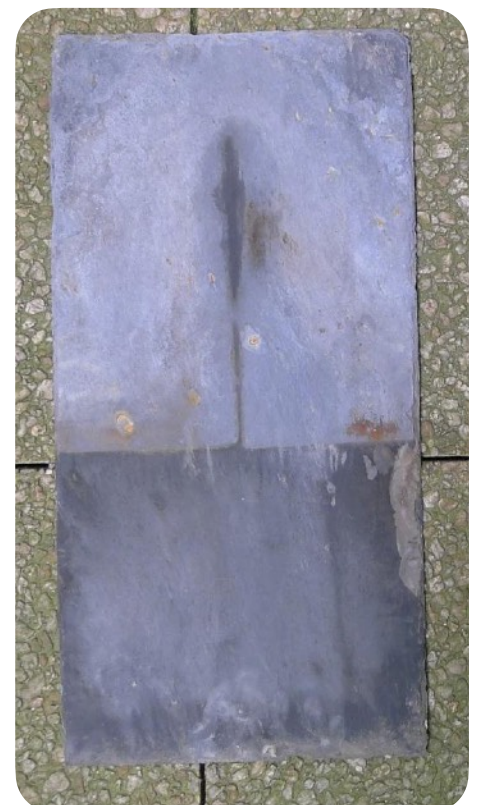
The careful installation or removal of a natural slate roof requires specific know-how. These works are generally entrusted to professional and highly qualified craftsmen (slate roofers).

→ *Formats*. There is a wide variety of models and sizes, usually associated with a manufacturer and/or a region of origin as well as the climatic and installation conditions. Most reclaimed slates are rectangular in shape. Their dimensions generally vary from 120/240 mm to 300/600 mm. There are occasionally square or diamond formats, as well as some particular “tortoiseshell” or “ogive” models. Depending on the model, the thickness generally varies from 2.5 to 9 mm. Reclaimed slate batches may contain models of uniform or variable dimensions (mixed batches).

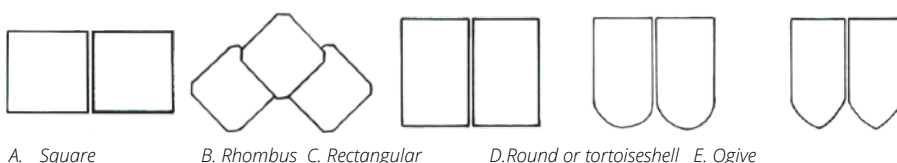
→ *Colours*. The colour of the slates varies greatly depending on their origin. They are available from light grey to black, passing through shades of orange, dark red, pink, shades of blue, purple and green. Due to the influence of external factors, a reclaimed

slate can show significant differences in colour between the margin (visible part) and the overlap (covered part). These testify to the difference in exposure to climatic elements and bad weather. In general, a uniformity of hue and colour within the same reclaimed slate characterizes a rather recent model, with a low content of carbonates and mineral inclusions.

→ *Appearance and finish*. Depending on their origin and their original production method, reclaimed slates may vary in appearance. For example: smooth or rough texture, presence of old nail holes, presence of traces of mosses and lichens on the exposed parts, variation in the direction of the longrain, etc.



Colour and shade variation between the protected part and the unprotected part © roofslates.com



Variations in the shapes of the slates.



Material reclamation

The reclamation of slate must always be done in compliance with the safety rules applicable to roofing work and preferably by a professional. If the slates do not find a new use directly on site, they can be sent to professional reclaimed channels. There are in fact operators likely to recover batches of slates. Their interest will depend essentially on the model, the quantities and the general condition of the batch.

→ *Dismantling test* (or expert opinion). In practice it makes it possible to ensure the feasibility and profitability of a removal. An “expert eye” makes it possible to estimate the interest of a batch based on photos, during an on-site visit or based on dismantling tests. The focal points will be among others:

- The general condition of the batch:
 - An overall examination of the roof generally provides a first indication of the slate's potential for reclamation (age, general appearance, slope, number of broken slates, percentage of repairs, presence of discolourations or delaminations, etc.). When the slates are placed on battens (installation with hooks) and the roof is not insulated, it is sometimes possible to observe the slates from inside the building. The environment also influences the lifespan and the possibility of reusing slates (i.e. inclination of the roof, atmospheric pollution, presence of trees, insulation and ventilation of the under-roof, etc.). For example, in North-western Europe, roofs facing east and south generally have slates that are less subject to weather factors and are better preserved than those facing west or north. An industrial environment or proximity to the sea are likely to affect the quality of reclaimed slates.
 - An in-depth examination of a slate sample makes it possible to assess their individual condition (*see sorting criteria*) and to extrapolate its characteristics to the entire batch. Checking for flexural strength and water absorption with appropriate testing can also help confirm the batch potential.

In general, natural slates tend to become more porous under the repeated action of humidity and temperature. They are also sensitive to certain forms of atmospheric pollution (acids). Over the long term, this can result in a gradual increase in their porosity, leading to a decrease in their water tightness. The speed and intensity of this decrease depend on several factors: thickness of the slate, intensity and repetition of external factors but also intrinsic characteristics of the original material. As such, the content of calcium carbonate (calcite) and iron (pyrite), linked to the original deposit of the slates, play a preponderant role in the mechanisms affecting porosity. Under the effect of carbonate, slate may tend to whiten and disintegrate over time (delamination). While pyrite, in its various forms, can cause disorders with various consequences (i.e. streaks of rust, oxidation, perforations). Thin slates with a high calcite and pyrite content therefore tend to degrade more quickly. It should be noted that deterioration affects both exposed and protected faces. Therefore, deteriorated natural slates generally cannot be returned and reused. The initial processing conditions also play an important role in the longevity of slates. Thus, a very sloping roof will tend to limit water retention at the slate level. A well-ventilated loft will also have a beneficial effect on the life of the slates.

- the installation method of the elements: the reclamation of slates is facilitated in the case of installation with a hook. For a nailed slate roof, it should be ensured that there is no excessive chipping at the level of the existing holes and that the latter are suitable for subsequent installation. If they are too wide, it will be necessary to check the possibility of creating new holes (minimum distance to the edges to be respected ~ 30 mm). Sometimes the slates have already been re-used several times. In the long run, the presence of many holes can complicate their reclamation.
- commercial interest, depending on the slate model, quantity, resale potential, regional specificities, etc.
- safety provisions such as condition of the frame, roof slope, building configuration, etc.
- logistics arrangements: deadline, working time, handling, transport, etc.

of nail is also a determining factor (iron nails are more difficult than copper ones). Fasteners are rarely recovered. In some cases it is necessary to sacrifice the first and last row of slates to facilitate removal.

It is advisable to carry out a first sorting during the removal, for example by separating the original slates from those used for “repairs”. In the case of slates laid in rows of variable length (for example laying with decreasing gauge), it is advisable to proceed with the dismantling row by row by grouping the slates of similar length.

→ **Removal.** Careful dismantling should aim to ensure the integrity of the slates and a certain uniformity of the batches. Using a roofer's ladder or scaffolding helps prevent stepping on slates that would not withstand a person's weight. The slates are ideally placed from the top of the roof downwards, using tools appropriate to the method of attachment (pliers, pincers, roofer's hammer, “slate ripper”, etc.). Hooked slates are easily detached after twisting the hook, while nailed slates can be more difficult to remove. For the latter, it is necessary to extract the nail by exerting a lever arm, while avoiding breaking the slate. The type



« Slate ripper »



Roofer's hammer

For batches of old and thin slate, the percentage of loss can be very high and reach 80%, or only 20% of the slates recoverable in the end (damaged edges, broken corners + breakage during removal).



→ **Sorting.** Once lowered, the slates can be sorted directly on site, or shipped in bulk to a professional dealer. The latter will then carry out a visual sorting and a rigorous classification according to the model and the dimensions, the qualitative aspect, the possible deteriorations, the colour, the degree of soiling, etc.

Some of the factors that may lead to the downgrading of natural slates include:

- Major damage: breaks, cracks, chips and punctures (other than old nail holes).
- Deterioration of the surface layer: crumbling, delaminations, protruding nodes.
- Deformations affecting flatness.
- Presence of through mineral or metallic inclusions.
- Presence of efflorescence and suspicious discolourations.
- Presence of numerous nail holes, or holes of unsuitable size;
- Presence of hazardous substances: lead, etc.

→ **Opérations.** Reclaimed natural slates are generally sorted qualitatively (model, dimensions, etc.). If necessary, they can be cleaned with a soft brush to remove moss, algae and other dirt. The use of a high pressure cleaner should be avoided as it could damage the surface layer and affect the waterproofing of slates. Some resellers and roofers also offer to resize and calibrate slates according to the desired model. Repairing nail holes is also possible under certain conditions.

→ **Storage.** Natural slate tiles are ideally stored and stacked in box pallets, taking the necessary precautions to limit the risks of breakage (packaging on the edge, separation of layers, tightening of the elements, etc.) and to avoid water damage.

→ **Transport and delivery.** The necessary precautions must be taken during transport and delivery in order to minimise breakage (strapped, shrink wrapped pallet, etc.).

It is advisable to involve specialised professionals to ensure the smooth running of these operations.



Breaks, cracks and splinters. © nachi.org



"Original" slates and "repair" slates.



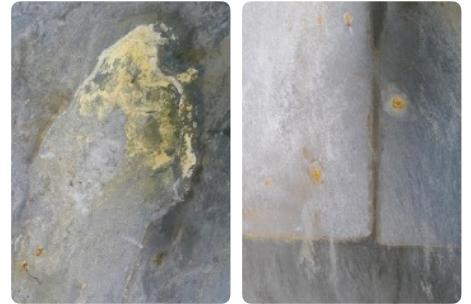
Efflorescence and delamination. © nachi.org



Storage of reclaimed slates © slateprices.co.uk

Hearing test!

To check if a slate is intact, you can probe it by tapping lightly with a hard object. A "dull" sound indicates an internal fracture, a "clear" sound means that the slate is unaltered.



Mineral inclusions and traces of rust.



Mineral inclusions and traces of rust. © nachi.org



Colour variation © toiture.pro



Storage of reclaimed slates © hastingswhite.co.uk



Applications and installation

Reclaimed slates are primarily used as roof covering or waterproof exterior cladding, but they can also be used for other less demanding applications such as decorative cladding or interior facing. As a general rule, the choice of slates must take into account the expected stresses (see § Characteristics and fitness for use) and urban planning regulations. In all cases, reference should be made to the European and national standards relating to the product (e.a. EN 12326: Slates and stones for roofing and exterior cladding for discontinuous installation) and in accordance with the rules of practice in force and the applicable installation standards.

The reuse of a complete batch of reclaimed slates in good condition is no different from that of new slates. As long as they are not already perforated, they lend themselves to the same variety of installation methods. They raise the same points for consideration, in particular: properties and condition of the frame and sub-roof, climatic and meteorological factors, overlap, minimum slope, fastening system, air and vapour tightness, roof ventilation system, thermal and acoustic insulation, drainage and rainwater collection, installation costs and times, specific maintenance, etc.

In general, the frame should be sized appropriately, given the potentially heavier weight of a slate roof. A minimum roof slope must be observed.

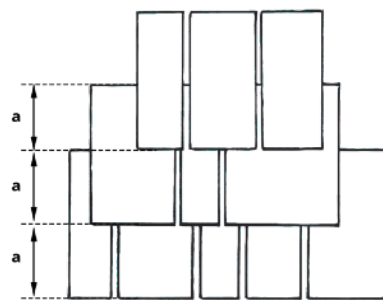
→ **Fixing.** reclaimed natural slates are fixed with nails or hooks (galvanized, copper or stainless steel). Those with old nail holes are preferably re-nailed and existing holes should be examined to ensure they are in good condition and can be reused. Otherwise, new holes can be made (minimum distance from the edge: 30 mm, minimum distance from old holes: 20-25 mm). Hooking old nailed slates is possible as long as waterproofing can be ensured (depending on the size of the slates, the positioning of the holes, the slope of the roof, the exposure conditions, the overlap, etc.). Installation with nails is carried out on laths and is generally less rapid and more expensive than installation with a hook, which is done on battens. The installation of slate at the level of complex roofing structures (valleys, hip, ridge, chimneys, dormers, etc.) requires excellent know-how.



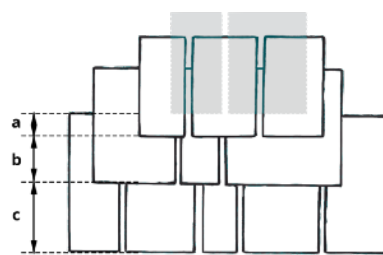
Hook installation, Caserne de Reuilly, Paris (FR)



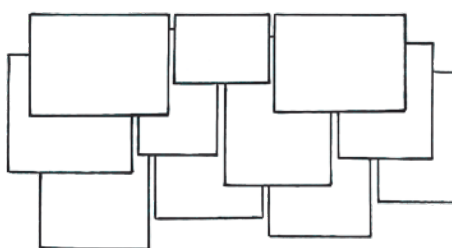
Nail installation (source: Pixabay)



Mixed installation: gauges of equal length, variable width of the slates.



Mixed installation: gauges of decreasing length, variable width of the slates.



"Staggered butt" installation: use of slates of variable formats and dimensions.

Tip !

Reclaimed slates generally do not have technical documentation or specific installation guides. It is therefore advisable to call on a professional roofer/slater to support your project.

→ **Equipment.** Depending on the use (roof or cladding), the shape of the roof, the type of slate, the age of the building or the budget available, there are a large number of types of installation and ways of placing the slates. Some are suitable only for batches that are uniform in size and thickness, while others adapt to greater variability. For example :

- Mixed laying is ideal for laying slates of varying width.
- The traditional laying with decreasing gauge (i.e. the slates are larger at the foot of the slope and smaller and smaller as you go up towards the ridge) allows working with slates of variable width and length (identical length per row).
- In the United States, the so-called "staggered butt" installation allows a mixture of slates of variable width and length or staggered installation on the roof.

To choose a type of installation, it is necessary to define the length of the necessary overlap. This depends in particular on the slope of the roof, the region, the orientation, the drainage length and the fixing method. Overlap tables (see national implementation standards) are used to determine this value. In general, the height of the slates must be at least equal to 3 times the value of the overlap. In some cases, slates can be re-cut, but this involves an additional cost.



To facilitate laying, the specifier will take care to use batches with a certain degree of uniformity in terms of the following characteristics:

→ **Batch composition.** The batch must consist of slates of the same type and same format. In order to ensure relative uniformity of their characteristics, it is preferable to ensure that the slates come from the same original roof.

→ **Completeness of the batch.** Before purchasing a batch or opting for reuse on site, it is necessary to ensure the availability of the necessary accessories (new or reclaimed) and their compatibility when re-using a reclaimed slate roof covering as well as the availability of batches (new or reclaimed) that can complete the area to be covered if necessary.

→ **Dimensional characteristics.** The nominal dimensions and the thickness of the slates must correspond and satisfy the chosen method of installation. The dimensional tolerance will be determined by the specifier according to the installation constraints. It is important to note that most professional suppliers of reclaimed natural slates offer “traditional” models, which have elements of varying sizes.

→ **Colour and appearance.** Variations in colour and appearance are possible within the same slate batch. In the case of reclaimed slates, these variations may be due to the chemical composition, the origin and quality of the batches used, the original exposure, etc. For these reasons, it is advisable to mix the slates when installing.

→ **Condition.** The designer/specifier can specify the condition of the slates tolerated. For example, reclaimed slates may show minor alterations such as:

- superficial chips and signs of wear
- slightly chipped or cut edges
- slight damage to the fixing holes
- stains, traces of mould or lichens, efflorescence
- etc.

These deteriorations can influence the technical and aesthetic performances of the slates, as well as their reinstatement, but do not constitute a major obstacle for reuse (see § *Characteristics and fitness for use*). It is up to the specifier to define the degree of imperfection tolerated, according to the defined use and the installation conditions, by specifying the degree of acceptable alterations.

→ **Quantity.** Some suppliers may include a 5 to 10% surplus during delivery to cover the risks of breakage during transport and handling as well as losses related to the sorting and classification process by the roofer/slater at the time of installation. This amount can vary considerably depending on the type and complexity of the roofing project, and can be particularly high and difficult to predict when using slates of random size. Generally, this surplus prediction can also be applied in the case of an on-site salvage scenario.

Most professional suppliers are able to ensure that delivered batches meet these requirements. Generally, reclaimed building materials are sold as is. The conditions of sale may however contain special guarantees specific to the material. Some suppliers are able to indicate the origin of the material and/or provide documentation on the product purchased (for more information, see the introductory sheet).

Tip !

It is recommended to purchase a sufficient quantity of slates from the outset. Each delivery of reclaimed slates has a unique composition. The slates of a subsequent delivery may therefore have different dimensions and colours.



Nailed installation of reclaimed slate, thick model, mixed installation with decreasing gauge (FR)
© Sarl Ritouet



Nailed installation of reclaimed slate, thick model, mixed installation with decreasing gauge (FR)
© Sarl Ritouet



Hook laying of reclaimed slate, fine model (FR)
© Sarl Ritouet



Slates reused as wall covering inside, Hôtel Pasteur (FR) © Encore Heureux architectes



Characteristics and fitness for use

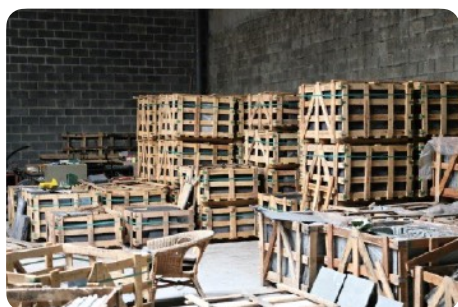
The harmonised European standard EN 12326-1 (product specifications) and -2 (tests) establishes the relevant characteristics (depending on the context) in order to determine the fitness for use of natural slate for roofing and exterior cladding. Although detailed for new materials, these characteristics may prove useful in considering the specific case of reclaimed slate shingles. In general, the expertise of a professional can be useful and necessary to assess the performance of a batch of reclaimed slate shingles.

| Characteristics | Comments |
|--|---|
| Dimensions (length, width), regularity of shape | <p>These characteristics are closely linked to the degree of sorting of the shingles and the method of installation envisaged during re-use. A visual or detailed examination of the batch is often sufficient to evaluate them.</p> <p>For uniform slate batches intended for a fixed geometry installation, it is advisable to pay particular attention to these characteristics. By way of comparison, a tolerance in the order of ± 5 mm over the length and width of the elements is recommended for new slates. It is also advisable to check the flatness and straightness of the elements. However, certain installation methods (see § "Applications and installation") make it possible to work with slates of more heterogeneous dimensions.</p> <p>If necessary, natural slates can optionally be re-cut.</p> |
| Thickness | <p>In order to facilitate installation, it is recommended to work with batches of reclaimed natural slate of uniform thickness. It is common practice to assess the average thickness of slates based on a sample of 100 slates ("stacked thickness"). In practice, it is recommended that the deviation from the average does not exceed 25%.</p> <p>In general, the minimum individual thickness of new slates is determined from tabulated values depending on the dimensions of the slates, their flexural strength and the climatic and constructional characteristics of the region of application (see Annex B of EN 12326). In addition, adjustment factors should be applied according to carbonate content and sulphur exposure performance.</p> <p>In the case of reclaimed slates, it can be assumed that batches which have experienced their first use without obvious deterioration are correctly dimensioned in thickness. A visual inspection accompanied by simple measurements is then sufficient to evaluate this characteristic. In most cases, it is recommended to work with reclaimed slates with a thickness greater than 3.5 mm.</p> <p>Most of the time, slates are also sorted by thickness by professional roofers at the time of installation. The thicker slates are placed at the bottom of the slope, the medium ones in the middle and the thinner at the top of the slope.</p> |
| Density | Usually between 2700 and 2900 kg/m ³ (for information only). |
| Structure | Slates showing cracks, breaks, crumbling are discarded. An audible test can be set up at the time of re-installation (see box "Hearing test!"). This characteristic is therefore linked to the degree of sorting of the reclaimed slates. A visual or detailed examination of the batch is often sufficient to assess it. |
| Surface quality | <p>A visual examination of the slates ensures this quality. Slates suffering from alterations such as cracks, breaks, coloured inclusions, piercings (other than old nail holes), crumbling, delaminations and protruding knots must be strictly avoided.</p> <p>Scratches, scuffs and other signs of friction are not considered to be defects as long as they do not affect the physical and mechanical properties of the slates.</p> |
| Water absorption and frost resistance | <p>To ensure their durability, new slates must have a water absorption of less than 0.6% (by mass). For higher values, a freezing test is recommended.</p> <p>Reclaimed slates, for their part, have already undergone cycles of variation in humidity and temperature. Their physicochemical properties and their sensitivity to freezing are likely to have changed over time. While it is relatively easy to see frost damage (delaminations, crumbling, etc.), it is generally more complicated to determine precisely what their precise performance is in terms of water absorption and frost resistance. The absence of notable damage constitutes an indication suggesting a certain quality of the slates, but only further tests will allow this property to be confirmed. The original application of the slates can be another useful clue, especially if they come from an area with a harsh climate.</p> |



| Characteristics | Comments |
|---|--|
| Carbonate content | If the carbonate content of slate is too high (> 20%), it is possible that it will start to swell and disintegrate over time. This phenomenon is more frequent for slates of Italian and Portuguese origin and can be aggravated by ambient pollution. Whitish spots are also likely to appear on the surface of slates. This is more of an aesthetic problem since these stains do not affect the durability of the element. Visual examination and sorting of reclaimed slates can generally allow problematic elements to be rejected. A specific laboratory test can also be considered. |
| Oxidability | Oxidation occurs due to the presence of iron sulphides included in the slates. It is clearly seen through the presence of a rust-orange veil. Reclaimed slates sensitive to oxidation and having been subjected to external factors will generally show traces of rust (up to perforation in certain cases of through pyrite). Depending on the case, this characteristic can affect an entire batch or just part of the elements. A rigorous sorting generally makes it possible to reject problematic elements. Generally, a visual or detailed examination of the batch is often sufficient to evaluate these characteristics. For more recent slates, sulphur oxide or thermal shock tests make it possible to highlight this risk. |
| Sulphur dioxide behaviour (SO₂) | The measurement of the reaction to sulphur dioxide is recommended in highly polluted regions (automobile, industrial or urban pollution). The SO ₂ can indeed cause a softening of the slate which will then have to be chosen thicker. However, depending on their geographical area of origin, reclaimed slates have been able to demonstrate their behaviour to SO ₂ during their previous use. A detailed inspection of the batch can then be used to eliminate unsatisfactory slates. If not, a specific laboratory test can be considered. |
| Thermal shock resistance | The specifier will ensure that the behaviour of the slates to thermal shock is in line with the type of installation and the intended use. In general, depending on their geographical area of origin, reclaimed slates have been able to demonstrate their behaviour to thermal shocks during their previous use. Rigorous sorting and visual examination make it possible to reject slates sensitive to this parameter. A specific laboratory test can also be considered. |
| Flexural strength | This characteristic should be taken into consideration according to the climatic zone (strong winds, snowfall, etc.) and the configuration of the roof (orientation, slope, etc.). It varies between 30 and 70 N/mm ² . The performance level makes it possible to determine the minimum thickness of the slates, depending on the length of the elements (tabulated values, <i>see above "thickness"</i>). In general, it can be assumed that reclaimed slates, having experienced their first use without obvious deterioration, are correctly sized with regard to their flexural strength performance. A visual examination accompanied by simple measurements is then sufficient to evaluate this characteristic. |
| Performance regarding an exterior fire | According to the European Commission decision 2001/671/EC, slate shingles belong to the BROOF class (t1) without additional testing, subject to the design and proper realisation of the roof. |
| Reaction to fire | In accordance with European Commission Decision 96/603/EC, slate shingles are classified as non-combustible materials and belong to the European reaction to fire class A1 without prior testing. |
| Toxicity | The slates must not be contaminated with asbestos or lead (visible as grey traces) from external elements. This characteristic is therefore linked to the degree of sorting of the reclaimed slates. A visual or detailed examination of the batch by a professional is often sufficient to assess it. |

However, in the event of specific and demanding applications, parameters related to characteristics such as mechanical resistance, frost resistance or impermeability can be measured and quantified using tests carried out by accredited laboratories.



Storage of reclaimed slates



Storage of reclaimed slates © slateprices.co.uk



Storage of reclaimed slates © slateprices.co.uk



Availability

Slate shingles are present in relatively large quantities on the reclamation market, depending on the model and the geographic region. The most common batches of models easily reach a few hundred m². The market is most developed in the United Kingdom. Some professional suppliers offer batches of more than 15,000 pieces.

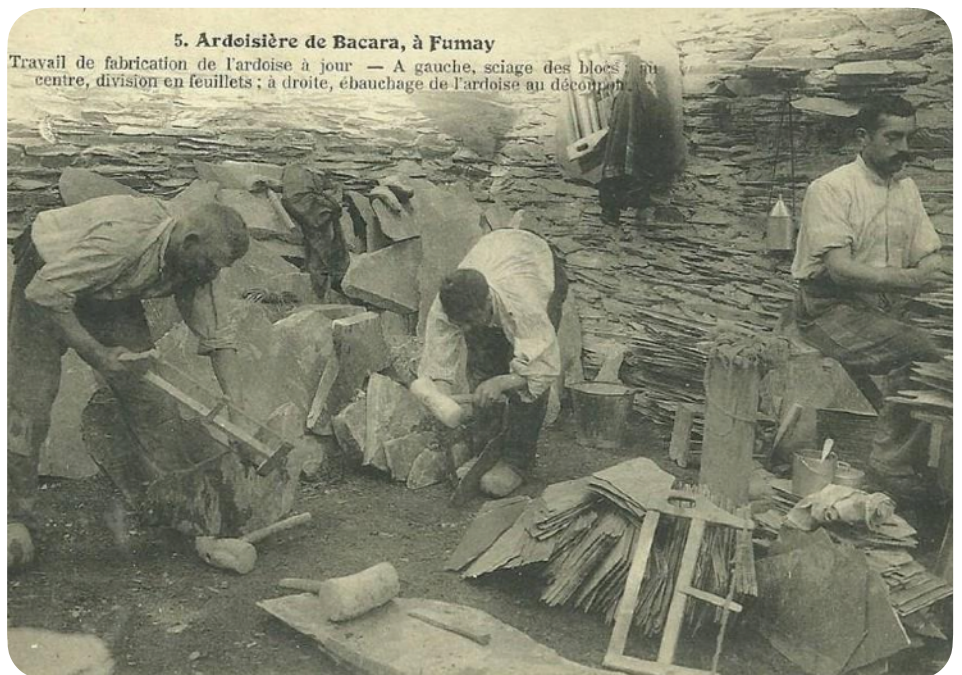
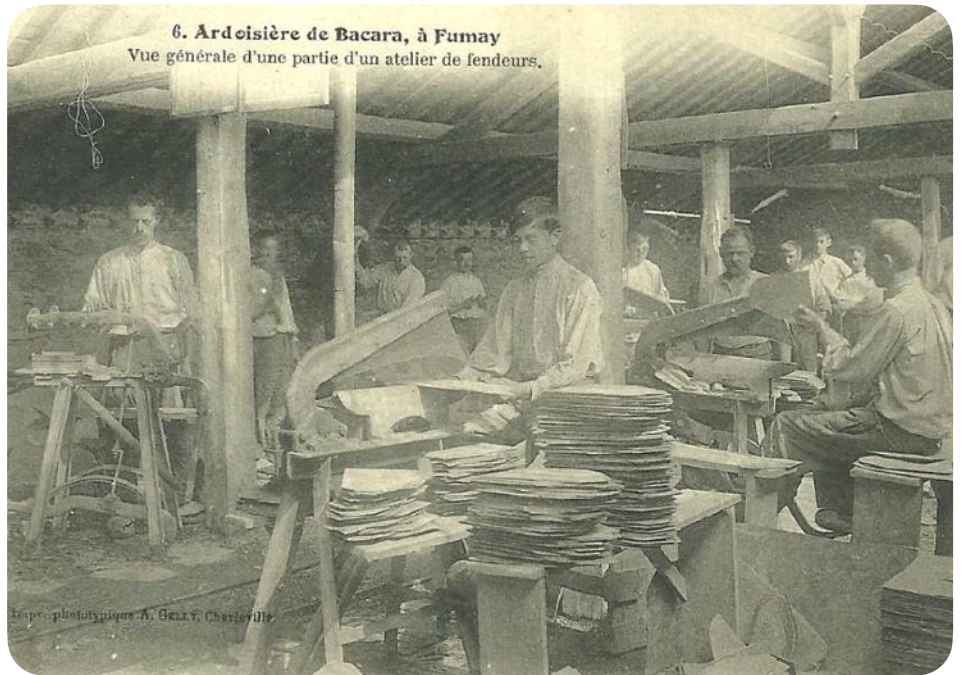
The rarer models and some decorative items are mainly sold for repairs or roof renovations. Some resellers are also suppliers of new slates and accessories.

Indicative prices (Excl. tax)

Random sampling of the reclamation market in Western Europe (Belgium, France, Great Britain and the Netherlands) made it possible to extract some indicative prices. These vary according to the models and their dimensions, the quality of the batches, their rarity and the suppliers. Reclaimed slates can be sold per unit, per square metre or per ton.

- Common models for waterproof covering: 0.5 to 2 € per slate; 30 to 50 €/m²
- Rare models: up to € 4.5 per slate; 50 - 150 €/m²

Larger models are more expensive, but their installation is faster.



Workshop for manufacturing natural slate roofing elements in the early 20th century, Ardoisières Baccarat, Fumay (FR).

Find specialist providers

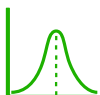


Embodied carbon (Cradle to gate - production A1-A3)

| | kg CO ₂ eq./m ² |
|--------------------------------------|---------------------------------------|
| INIES database (FR) – Generic data * | 9.82 |
| CTMNC – Collective Declaration ** | 3.59 |

* Indicative value to ensure the slate roofing of 1 m² of roof to a thickness of 4 mm while ensuring waterproofing for a reference life of 100 years.



** Indicative value to cover 1m² of roofing with CUPA Natural Slates of 4.5 mm thickness and dimensions 32x22 cm (used as roofing), installed outdoors on the roof, for a period of 100 years.



According to the sources, reusing 100 m² of reclaimed natural slate shingles prevents the production of ~ 359 to ~ 982 kg of CO₂ equivalent related to the quarrying and production of new slates (production phase only). By way of comparison, this gas quantity corresponds to the emissions caused by a small diesel car during a trip of ~ 2,150 to ~ 5,900 km.



Hazardous substances and precautions

| | |
|---|---|
|  | <p>Some slates may also have been contaminated with <i>lead</i> or other substances from associated roofing elements. Vigilance is necessary in case of interior application or likely to come into contact with people. In case of doubt, this diagnosis can be carried out either using a commercially available lead test kit, or by sending a sample to the laboratory or by having this test carried out by a professional.</p> |
|  | <p>From the second half of the 20th century, large quantities of artificial slates were made from <i>asbestos</i> fibre cement. It is not uncommon to encounter this type of slate when repairing natural slate roofing. In case of doubt, it is recommended to discard questionable slates and treat them as hazardous waste. Generally, artificial slates are easily recognizable to the naked eye (no splintering and smooth edged, regular appearance, visible fibres, presence of lettering, etc.). Laboratory diagnosis is also possible.</p> |



Reclaimed slate roof and cladding, Ty Pren project (UK), Feilden Fowles architects © David Grandorge



Reclaimed slate © thereclaimedcompany.co.uk



Slate reused and re-installed on the roof © thereclaimedcompany.co.uk