

Roof Underlayment – Why It Is Important

When a roofer first walks onto a job, unless he's tearing off an old roof-covering material, he's faced with a bare roof deck. The first component to be installed on the roof is underlayment.

Underlayments are manufactured with different properties designed to meet the needs of homes in different climate zones. An underlayment that works well under metal roofing in a hot, humid place like New Orleans, Louisiana, may not work well beneath wood shakes in a cold, dry climate like Jackson, Wyoming.

The different types of roof-covering materials may also have specific underlayment requirements.

Although underlayment is typically required in new construction by building codes, in the past, roof-covering material manufacturers haven't always required it on slopes of 4:12 and steeper.

Purposes Of Underlayment

Moisture Barrier

Most roof-covering materials are not waterproof, but water-resistant, and are designed to be installed over a waterproof or water-resistant membrane of some type. "Underlayment" is the general term used to describe these membranes.

Even though the underlayment is the first material to be installed on the roof deck, the roof-covering material -- the shingles, tiles, metal or slate -- is the primary barrier against roof leakage. Underlayment is a secondary barrier.

Water-resistant underlayment may allow the passage of moisture vapor, but will prevent the passage of water in its liquid form. Waterproof underlayment will prevent the passage of both liquid water and water vapor.

Waterproof underlayment is typically used on parts of the roof that are more likely to leak or suffer moisture intrusion. This includes penetrations in areas where roof-covering materials change or end, and low-slope sections of roof. It's not unusual to use combinations of underlayment on a home's roof.

The permeability of underlayment is the extent to which it allows the passage of water vapor. Although all underlayments are designed to prevent the passage of moisture in its liquid form, they can have different levels of resistance to the passage of water vapor.

Underlayment permeability ratings are provided by the manufacturers, and are less important in roof underlayment than they are in housewrap. Underlayments with a perm rating of 1 or less are moisture barriers. Underlayments rated above 1 are moisture retarders.

Temporary Protection

Underlayment provides temporary protection of the building interior and the roof deck before the roof-covering material is installed.

Ideally, the roof-covering material would be installed as soon as possible, but in the real world, the roof may be protected by only the underlayment for days, weeks, or sometimes months.

Protecting the building interior is especially important when an old roof-covering material is being replaced and the home interior is finished. During that time, the underlayment may be under attack from weather elements such as high winds, UV radiation, and precipitation. It also needs to resist the wear and tear that occurs when the roof-covering material is being installed.

Preventing Chemical Degradation

Underlayment also provides a layer of separation between the roof sheathing and the roof-covering material.

Newer homes use plywood or an engineered panel called oriented strand board (OSB) for roof sheathing

For many years, pine and fir boards were used as sheathing, and many older homes still have these boards in place. Resin pockets in these boards can react chemically with some roof-covering materials, such as asphalt shingles. In these situations, missing underlayment can cause accelerated deterioration and premature failure of the roof-covering material.

Fire Resistance

Underlayment materials are available for wood roofs which increase their resistance to fire. In fact, without special underlayment, wood shakes and shingles cannot achieve a Class A fire rating, which is the highest available.

Factors Affecting Underlayment

A number of factors can affect the performance of underlayment and determine which types are appropriate:

Climate Types

For purposes of determining optimum roofing material, depending on location, climates in North America can be separated into two basic categories:

- hot or cold dry climates and;
- hot or cold humid climates.

Hot and dry climates will affect bituminous underlayment by accelerating the loss of volatiles.

In humid climates, older felt underlayment will absorb more moisture which, in turn, can be absorbed by the substrate, causing it to expand. In cold climates, underlayment will become brittle and more easily damaged by footfall and impact.

Each of these climate types should have underlayment installed which has performance characteristics compatible with that particular climate.

Roof Design

Some designs shed runoff quickly. Some have design features which may actually trap runoff and expose the underlayment to more moisture.

Roof-Covering Material

Manufacturers produce underlayment of different types for use with the different types of roof-covering materials. The use of underlayments that are not compatible with the roof-covering material with which they're installed can cause problems.

Roof-covering materials in poor condition which expose underlayment to weather, especially to UV radiation from sunlight, can accelerate deterioration.

Missing Underlayment

Although underlayment is typically required in new construction by building codes, in the past, some manufacturers have not required it on roofs of 4:12 and steeper.

Determining whether underlayment was required means finding the manufacturer's installation instructions for that particular roof-covering material, and also finding out what jurisdictional requirements were in place at the time the home was built.