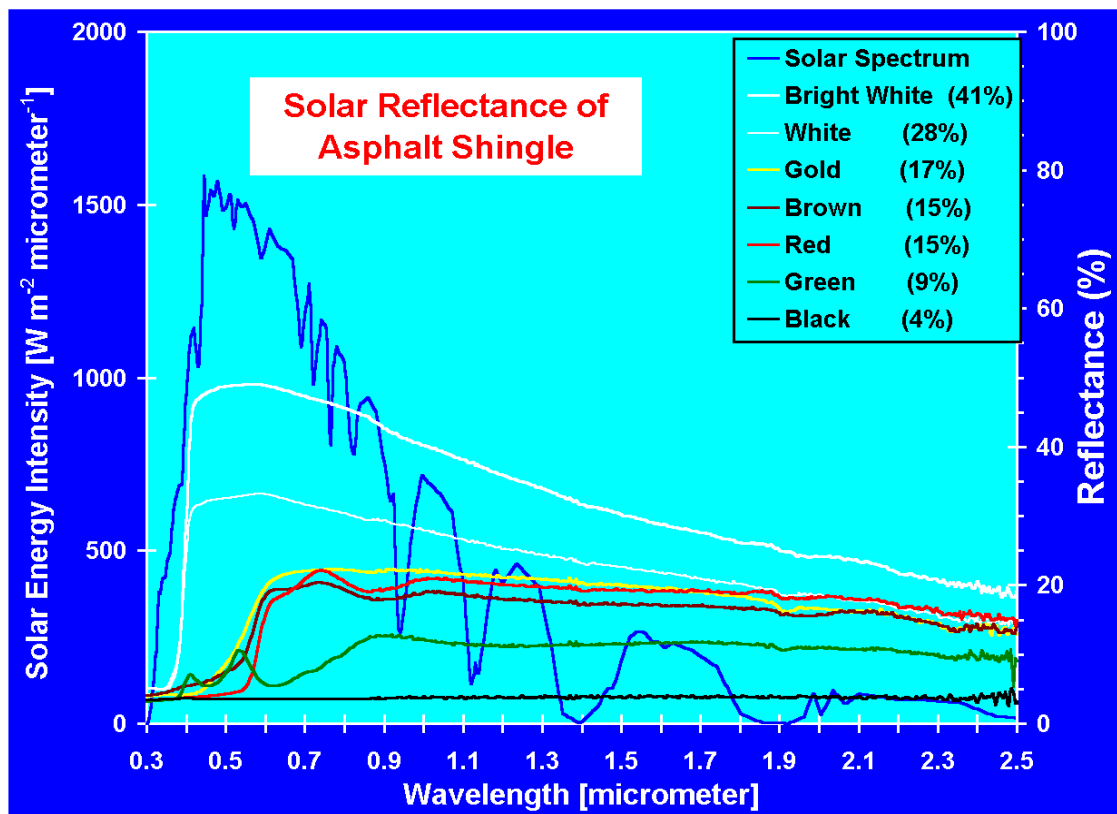


Asphalt Shingles

Source/Author: Lawrence Berkeley National Laboratory, etd

Asphalt shingles are a very economic roofing choice, which have a large share of the market, including most houses with sloping roofs. From a reflectance point of view, they are very similar to rolled asphalt roofing, which is often used as the top layer of low slope roofing. These materials are composed of asphalt saturated mats made from organic felts or fiberglass. The asphalt is protected from the sun's UV light by roofing granules pressed into the shingle while it is hot (and soft). The roofing granules are 1 millimeter-sized stones (e.g., of crushed granite), which are coated with an inorganic silicate material. The coating contains microscopic pigment particles, similar to those used in paint, to provide color.



Energy Seal Coatings

Acrylic Coatings for Roof and Wall Applications



The solar reflectance of all commercial asphalt shingles is rather low (see table). Premium white shingles are only about 30% reflective, and other colors reflect less. The low solar reflectance can be attributed to several factors. First, there is a limited amount of pigment in the granule coating. Also, the roughness of the shingle contributes to multiple scattering of light and thus to increased absorption. Finally, the black asphalt substrate is not 100% covered, and reflects only about 5% of the light which strikes it. ISP Minerals of Hagerstown, MD has developed a whiter white (Bright White) roofing granule which can be fabricated into shingles with reflectance exceeding 40%. It is hoped that this granule will become available commercially.

Energy Seal Coatings

Energy Seal Coatings can be used to seal and rejuvenate aged asphalt shingles. This rejuvenation will not only greatly extend the service life of the shingle it will also provide the maximum amount of solar reflectivity.

Bright White roof shingles will reflect 41% of the heat energy from the sun.

Acu-Shield on asphalt shingles will reflect in excess of 62% of the heat energy from the sun.

Acu-Shield will offer 50% more solar reflectance.