

## How to use the Cool Roofing Materials Database

We suggest you examine the relative “coolness” of various types of building materials, to select a type of roofing or roof coating which may meet your needs to reduce air conditioning energy use or to improve comfort. Although a very wide variety of materials are available, most materials fall into a few classes. For example, most white materials have a solar reflectance of 0.65 to 0.85, a high infrared emittance (which is good), and only heat up about 1/5 as much as black materials above air temperature in the midday sun. To take a first look, we have tabulated below the temperature rise in full sun. We have also assumed that there is little wind (wind helps cool the roof). For more details, click on the headings in the main data tables. Keep in mind that this is the temperature rise, not the temperature itself. Thus a temperature rise of 90 degrees on a 100 degree day means the roof temperature peaks at 190 degrees!

Material	Roof temperature rise above air temperature (degrees F, full sun, no wind)	Remarks
Bright white smooth materials	15 F	The coolest construction materials. Can be roof coating, membrane, metal, tile, etc. A soiled white is warmer, about 30 F.
Rough white surface	35 F	Rough surfaces of any given material absorb more sunlight than smooth surfaces
Very light (pastel) colors	15 to 55 F	
Intense but not very light colors (green, red, blue, etc.)	79 to 83 F	Research may identify cooler colors
Medium gray	52 F	Reflectance half way between white and black
Aluminum-pigmented asphalt roof coatings	50 to 65 F	The brightest aluminum coatings are the coolest
Built-Up Roof (BUR) covered with gravel	61 -83 F	Cooler values obtained with lighter gravel
Asphalt shingles and granulated capsheet	72 to 90 F	The lighter asphalt shingles are cooler, but not much. In particular, even "white" asphalt shingles are hot.
Black materials	90 F	

One you have chosen one or two prospective types of cool roofing materials, it's time to get information directly from contractors or manufacturers regarding the type of work to be done. Some sources of cool roofing materials are listed in our pages; these should be supplemented with your own web search, the yellow pages, etc. Cool roofing materials offer excellent benefits in terms of improved summertime comfort and reduced air conditioning costs. However, as with any construction project, quality, durability, warranty, etc., are overriding considerations. Don't forget to check the references of prospective contractors.