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SERVICE WORKS

"UP ON TOP" NEWS

Selecting The Correct Roof Coating - Part 1

Because there are more roof coatings available to roofing contractors than ever before, it can be difficult to choose the correct coating. Choosing a coating becomes even more complicated given the myriad of roof systems currently on the market. Before you can determine what coating to use, it is important that you understand some basic information about coating technology.

Roof coatings are classified according to binder type and carrier type. Application methods and compatibility with existing roof surfaces stem from binder type and carrier type.

A coating's binder is its basic matrix material that adheres to a roof surface. Different binder chemistries are used to meet price and performance criteria, as well as to match specific roof substrates. The binder type generally dictates most of a coating's primary physical properties, including elongation, tensile strength, adhesion to a particular substrate material, permeance, water swelling, low-temperature flexibility, and resistance to fungi and dirt. Binders commonly used in roof coatings range from asphalts to a wide variety of elastomers (acrylics, urethanes, silicones, thermoset rubbers and various block polymers), as well as blends of these. Binder chemistries constantly are evolving, and new coating formulas are being developed for special applications.

A coating's carrier is a liquid that is combined with the binder to reduce the coating's viscosity to a workable level. The carrier generally evaporates during curing of the coating. The carrier also generally dictates a coating's installation process and cure time.

Water can be used as a carrier, in which case the binder generally is suspended in the water as an emulsion. But traditionally, most coating binders use solvent as the carrier.

Environmental regulations tend to favor water-based emulsions over solvent-based coatings, which are high in volatile organic compounds (VOCs). It generally is easier to clean a work site when a water-based coating is used. However, in many applications, solvent-based coatings wet surfaces better. ("Wetting" refers to the contact between a liquid and surface. A liquid with high surface energy—or strong internal bonds—tends to form droplets; a liquid with low surface energy tends to spread out on a surface.) Also, solvent-based coatings cure in a broader range of weather conditions and provide more water-absorption resistance than water-based coatings.

A coating's cure rate can vary greatly because it is affected by ambient humidity, temperature and sunlight. This is especially true of water-based coatings, which can dry slowly and even freeze in winter and can dry faster than conventional coatings in summer. If a coating is not properly cured, its performance can be compromised.

A coating's permeance and thickness also affect its curing process because a thick coating with low permeance can "skin over" with the top layer curing first and preventing the remainder of the carrier from evaporating.

Pigments and fibers can be added to binders to control physical properties and increase reflectivity. Because reflectivity and emittance are defining properties of cool roofs, organizations such as the Cool Roof Rating Council have been formed to develop standardized methods for measuring these coating properties in real applications.

When initially installed, some white reflective coatings can reflect 80 percent or more of the sun's rays to reduce air conditioning costs. A highly reflective cool roof often can reduce energy consumption by 10 to 20 percent or more and can reduce urban heat island effects. When used as part of an ongoing roof system maintenance program, coatings typically can be treated as an expense, not a capital investment (as with reroofing).

Next month Part 2.

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