

Is thicker better?

Thicker TPO membranes should be considered

by Mark S. Graham

TPO SINGLE-PLY membrane roof systems have been installed in the U.S. since the early 1990s. Although TPO membrane manufacturers produce membranes in various thicknesses, 45-mil-thick TPO membranes are used in a vast majority of installations and have become the default membrane thickness for most specifications. This raises a question: Is thicker better?

Available products

Review of manufacturers' product literature reveals most TPO membrane manufacturers produce 45- and 60-mil-thick TPO membrane products. Several manufacturers also produce 72- and 80-mil-thick TPO membrane products.

Although TPO membrane manufacturers offer products of similar thicknesses, some manufacturers differ regarding where they place the reinforcement within their membranes' cross-sections. The dimension referred to as "thickness over scrim" indicates a reinforcement's placement and identifies the amount of membrane material above the reinforcement that is exposed to weathering and provides waterproof integrity.

Review of TPO membrane manufacturers' product literature reveals for 45-mil-thick membranes, manufacturers' thicknesses over scrim range from 15 to 19

mils. For 60-mil-thick TPO membranes, thicknesses over scrim range from 21 to 27 mils. For 72-mil-thick TPO membranes, manufacturers' thicknesses over scrim range from 26 to 30 mils. For 80-mil-thick TPO membranes, manufacturers' thicknesses over scrim range from 30 to 38 mils.

Manufacturers' product literature shows TPO membranes currently on the market are "mid-reinforced" and, as a result, thicker TPO membranes provide larger thickness over scrim values. Thicker membranes also provide greater puncture resistance and breaking strength than thinner membranes.

Specific installations

The decision of what thickness of TPO membrane should be used for a project is best made on a project-specific basis after considering project conditions and requirements.

For example, if a TPO membrane roof system is being considered for a roofing project that will have a short useful service life—say 10 to 15 years—with limited rooftop foot traffic, specifying a minimum of a 45-mil-thick TPO membrane appears acceptable.

But if a TPO membrane system is being considered for a project that requires increased durability, a 60-mil-thick or thicker TPO membrane should be specified. Examples of such situations include where


more than minimal rooftop foot traffic is anticipated, an extended useful service life is desired, or hail and/or other types of impacts are expected.

For TPO membranes to which a thin-film photovoltaic (PV) system will be applied, specifying a 72-mil-thick or thicker membrane with an enhanced ultraviolet stabilizer package should be considered. This will provide greater durability to account for the additional rooftop foot traffic and higher roof surface temperatures that typically are associated with thin-film PV applications.

Closing thoughts

Although TPO membranes have been used in the U.S. for nearly 20 years and 45-mil-thick membranes are by far the most common, you should consider using thicker membrane sheets in some instances.

The determination of TPO membrane thickness and manufacturer should be made on a project-specific basis after considering project conditions and requirements.

I recommend roof system specifiers consult multiple TPO membrane manufacturers for their recommendations. If a manufacturer suggests using a thinner TPO membrane, a specifier should have a healthy skepticism of the thinner membrane recommendation. 

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For a list of specific TPO membrane manufacturers' product thicknesses and their thickness over scrim values, as well as links to their product literature, access www.professionalroofing.net.