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CARLISLE COATINGS & WATERPROOFING

AIR & VAPOR BARRIER

Thick vs. Thin
OSB Sheathing

Introduction

For many years, fluid-applied membranes have frequently been specified in commercial construction as air barriers, vapor barriers and water-resistive barriers in wall assemblies. Unlike mechanically attached sheets, fluid-applied membranes provide improved air and water tightness, full adhesion to the substrate, monolithic installation, and sealing around brick ties and fasteners. Their manufacturers specify installation at many different mil thicknesses, which affect many properties of the installed system, including effective substrate coverage and the continuity of the air barrier assembly.

Specifiers of roofing systems and traffic coatings would not classify systems of different thickness as equals. Yet fluid-applied membrane air barriers, whose specified mil thickness varies between 8 mils and 120 mils, are often placed in the same specification and classified as equal. In spite of the emergence of thin-mil systems, the most common specified dry film thickness of fluid-applied membrane products is 40 mils. This matches the thickness of self-adhering roofing underlayments and self-adhering air/vapor barrier membranes, both of which have a very good track record of providing effective waterproofing in their respective applications.

The Comparison

Carlisle Coatings & Waterproofing Incorporated (CCW) made a side-by-side comparison of two coatings. The objective was to observe the effects that mil thickness has on coverage and continuity when applied to OSB sheathing, an air barrier that is not very resistant to long-term moisture exposure. Because OSB sheathing has so many surface irregularities that make it especially rough, it is somewhat difficult to cover using fluid-applied membrane. While the manufacturer of Coating A recommends a one-coat application of 60 mils, the manufacturer of Coating B recommends two separate 10-mil coats.

Coating A, Dry on OSB

The 60 mil wet coating dries and completely covers the rough substrate.

Coating B, Dry on OSB

Two 10 mil wet coats still leave uncovered holes over the irregularities of this rough surface.

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Testing

Coating A – The manufacturer specified a minimum coverage of 60 wet mils. The coating was applied as recommended to 60 mils wet for complete coverage of the rough OSB surface.

Coating B – The manufacturer specified a minimum coverage of 20 wet mils. This coating was applied in two separate coats of 10 mils wet, for incomplete coverage that left uncovered holes and surface irregularities.

Conclusions

This test demonstrated that a thinner coating application results in insufficient coverage on an OSB sheathing substrate. In particular, the thin coating failed to completely cover the holes between the strands of wood on the rough surface. By comparison, a thicker coat provides reliable coverage over the substrate, including over flush-driven nails, self-adhering flashing terminations and caulked joints. The thicker coating also provides a seal around brick tie penetrations. Where a 16-mil dry coating is used, terminations of details remain defined, requiring additional detailing on screw, brick tie and flashing terminations to achieve a complete seal.

OSB construction with fiber cement siding nailed directly over the sheathing. Thicker membrane consistently covers rough, absorbent OSB surface while sealing around penetrations and providing continuity over edges of window flashing and sheathing joint reinforcement.

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