RCMA ROOF COATINGS MANUFACTURERS ASSOCIATION

COATINGS TECH NOTE 4

COLD-APPLIED ADHESIVES FOR MODIFIED BITUMEN MEMBRANE ROOFING

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There are several recognized methods that have been used for the installation of SBS or APP modified bitumen membranes. These include application by hot bitumen mopping, torching, mechanical attachment, self-adhesive materials and the use of cold applied adhesives. This document is intended to provide background information on the use of cold adhesives for modified bitumen membrane systems and more specifically to describe the proper techniques for the successful installation of modified bitumen membranes using cold-applied adhesives.

Uses for Cold-Applied Adhesives:

These products were initially formulated and designed as the inter-ply adhesive in the construction of BUR roofing systems utilizing asphalt coated organic felt and fiber mat. Later, cold-applied adhesives became a preferred method for adhering modified bitumen membrane roofing systems. This document is intended to address only the function of these adhesives for bonding modified bitumen membranes. Consult with both the appropriate membrane and adhesive manufacturer for additional uses and application instructions.

Types of Cold-Applied Adhesives:

The term “cold applied” is used to describe a product that can be applied at ambient temperature. The base resin for these adhesives generally consists of bitumen (asphalt or coal tar). Additional components may include: a polymer modifier, petroleum-based solvents, fibers, and fillers. The polymer chosen to modify the asphalt depends on the final properties desired. The most common modifiers for modified bitumen cold-applied adhesives are Styrene-Butadiene-Styrene (SBS), Styrene-Isoprene-Styrene (SIS), Styrene-Butadiene Rubber (SBR), and Styrene-Ethylene-Butylene-Styrene copolymers (SEBS). Acrylics, butyl, neoprene and urethanes are also used as modifiers.

Application Considerations:

The rate of application is of primary importance when using any cold-applied adhesive. The adhesive must be applied at the manufacturer's recommended rate and application temperature range, as excess material can trap solvent in the membrane, causing membrane softening, slippage, or loss of granules. An excessive amount of adhesive can cause the membrane to "float" and impede full adhesion to the underlying substrate. Inadequate amounts of adhesive can result in an incomplete or weakened bond. Unless the laps are to be torched or heat welded, a visible bleeding-out or "bead" of adhesive should be seen at the laps during application in accordance with the membrane manufacturer's instructions. This is a visual way to ensure that the critical lap areas have received sufficient amounts of adhesive.

Cold-applied adhesives should not be used with membranes which have poly burn-off films.

Cold-applied adhesives can be applied using a notched or serrated trowel, notched or serrated squeegee, roller, spray or automatic spreading equipment. Always follow the manufacturer's directions for coverage rate and application method. Verify the correct coverage rate of the cold-applied adhesive by measuring the volume applied in a small pre-measured portion of the roof, by using a wet film gauge, or by using applicators with metered flow rates.

Follow the membrane manufacturer's recommendations for unrolling and relaxing modified bitumen sheets prior to installation into the cold-applied adhesive. Follow the membrane manufacturer's guidelines for lap adhesion. Some manufacturers recommend that the laps be left dry until the field of the roof is completed. Then, the laps are adhered separately with a heavier-bodied adhesive. The membrane manufacturer may specify that laps be rolled after application. Some modified bitumen membranes are designed to have the lap areas heat (hot air or torch) welded together. It is very important to keep foot traffic and equipment off finished portions of the roof until the adhesive has set, as weight can displace the membrane in the uncured adhesive, creating a void, damaging the membrane and/or staining the roofing granules.

Installation of modified bitumen membranes by cold-applied adhesives takes longer to establish a complete bond than does application by hot mopping asphalt or torch. On slopes above ½ inch in 12 inches, membrane manufacturers often require rolls to be installed parallel to the slope (strapping) and nailed at the high point of the roll under the endlap (backnailing) to prevent slipping. Consult the membrane manufacturer for

specific fastening requirements. In strapped roof applications, the lap is typically positioned to face away from the prevailing winds.

Consult the modified bitumen membrane manufacturer's installation instructions for acceptable application temperature ranges for membrane materials. Cold-applied adhesives can typically be installed at temperatures between 50 ºF and 100 ºF (10 ºC and 38 ºC) and the recommended product temperature is between 70 ºF and 100 ºF (21 ºC and 38 ºC), to ensure that the adhesive is the proper viscosity for application. Full set times are dependent on many factors, including temperature, humidity, solvent type and coverage rates. Generally, colder temperatures, high humidity or high application rates slow the set-up time of the adhesive. For the specific application temperatures and rates, storage conditions and mixing instructions, consult the individual manufacturer's recommendations. One factor that must be kept in mind when using a cold-applied adhesive is that solvent vapor is released as the material dries. Care must be taken to ensure that solvent vapors do not get into the ventilation system.

Some adhesives contain flammable solvents; keep vapors away from ignition sources.

Application Tips:

- Start with an approved clean, dry, smooth substrate.
- Positive drainage is required.
- Ensure that solvent vapors will not be drawn into the building.
- Start at the lowest part of the roof.
- Install the adhesive evenly and at the recommended rate.
- Ensure the side and end laps are completely sealed.
- Contact membrane manufacturer for specific application guidelines.