



- TITLE:** Concerns Related to Water-Based Adhesives for Use in Roofing
- DESIGNATION:** IIBEC-TA-004-2013
- OBJECTIVE:** To provide commentary and to raise awareness of limitations related to water-based adhesives used with roof systems

A. BACKGROUND

- Volatile organic compounds (VOCs) are organic chemicals that are used in numerous applications, such as paints and adhesives, as a carrier to deliver a binder product. The main purpose of the carrier is to dissolve the binder and to adjust the viscosity of the product for application purposes. The carrier compound evaporates, and the binder remains to cure. In roofing applications, water-based products are used both as bonding adhesives and asphalt emulsions.
- Due to the recent limitations placed on VOCs, alternative means of delivering binder products, including the substitution of water-based carriers, have been developed. These products have lower odor and are more environmentally friendly than most solvent-based adhesives.
- Currently, VOC contents in products are restricted to certain quantities in California and most of the northeastern United States.

B. LIMITATIONS

- Water-based adhesives cannot be allowed to freeze, as the water suspension and polymer system will be altered. It is important to strictly adhere to temperature limitations during transport, storage, and installation.
- Water-based adhesives can break down or rewet if kept wet after installation and curing. This reversion can lead to adhesive and cohesive failure and loss of bond.
- The cure time prior to covering with the next layer in a roofing system will be different and usually longer than that of a solvent-based adhesive.

C. DISCUSSION

- Most water-based adhesives are not suspended in the liquid, but are emulsions. As a result, the adhesive particles can settle out of the water carrier fluid. Therefore, it is important to properly mix the adhesive prior to use. However, over-mixing can lead to the entrapment of air and foaming. Manufacturers' pails that are filled to near capacity make such mixing difficult to control without spilling.

DISCLAIMER

This Technical Advisory is intended to serve only as a general resource and to identify potential issues for consideration by industry professionals. Each person using this Technical Advisory is solely responsible for the evaluation of the Technical Advisory in light of the unique circumstances of any particular situation, must independently determine the applicability of such information, and assumes all risks in connection with the use of such information. The materials contained in this Technical Advisory do not supersede any code, rule, regulation, or legislation and are not intended to represent the standard of care in any jurisdiction.

- Since water-based adhesives usually cure more slowly than solvent-based adhesives, coverage rates, open times, and dry times can vary dramatically, depending on the weather, including temperature and relative humidity of the ambient air.
- Water-based adhesives have a typical shelf life of up to one year if the material is stored in its original sealed containers at approved temperatures (usually between 60° and 90°F or 15.5° and 32°C). If the material is exposed to temperatures below recommended temperatures, shelf life will be shorter.

D. RECOMMENDATIONS

- Check the local jurisdiction to determine if VOC limitations apply.
- Review the roof design to limit moisture ingress (both liquid and vapor) into the roof assembly. Consider the use of a vapor retarder over new concrete decks. Eliminate gaps that can allow interior air from entering the roof assembly.
- Require that the material supplier verify that the water-based products have been properly transported and stored at temperatures in accordance with the manufacturer’s printed literature.
- Require compliance with the manufacturer’s printed literature at all times, with particular focus on storage temperatures and proper mixing.
- Require the contractor to verify the proper tack of the adhesive often during application.
- Take care to prevent slippage of vertical flashing materials.

E. INDUSTRY STANDARDS AND RECOMMENDATIONS

- Midwest Roofing Contractors Association, Inc., “T & R Advisory Bulletin 2/2011, Noteworthy Limitations of Water-Based Bonding Adhesives.”
- Mark S. Graham, “Water-Based Adhesives Face Product Limitations and Reports of Problems,” *Professional Roofing*, National Roofing Contractors Association, December 2011.