

The NRCA Technical Services Department receives many calls and letters about various single-ply products and systems problems. Some of the questions have prompted the NRCA Technical Operations Committee (TOC) to examine these problem areas and seek solutions.

New single-ply products have been sprouting like mushrooms in the marketplace for the last seven to nine years. In 1976, there were only four manufacturers supplying seven different types of single-ply roof membranes. By 1984, there were 90 manufacturers supplying roughly 180 different single-ply systems.

If you think that all these new-systems are trouble-free, think again. Some faulty systems have made it to the marketplace even though NRCA has stressed many times that new products should be thoroughly tested before they are offered.

The Association believes that manufacturers should do their homework to make sure their products don't delaminate, separate at the seams or cause fasteners to rust. Manufacturers must also evaluate their products' performance in roof systems to make sure the membranes won't cause blisters, splits or blow-offs.

NRCA has received many reports of moisture accumulating in significant amounts on the underside of plastic and rubber roofing membranes. The Association is scrutinizing several theories about the cause of this accumulation. It has been suggested that:

- moisture trapped in the roofing assembly during construction vaporizes and rises, condensing on the underside of the membrane;
- moisture in wet roof insulation that has not been torn off before the new membrane is installed vaporizes and condenses;

- moisture and/or vapor from the structure's interior rises into the roof assembly and condenses on the cold membrane;

- moisture on the membrane surface permeates imperfections in the membrane or its open end or side lap joints and collects on the membrane; and

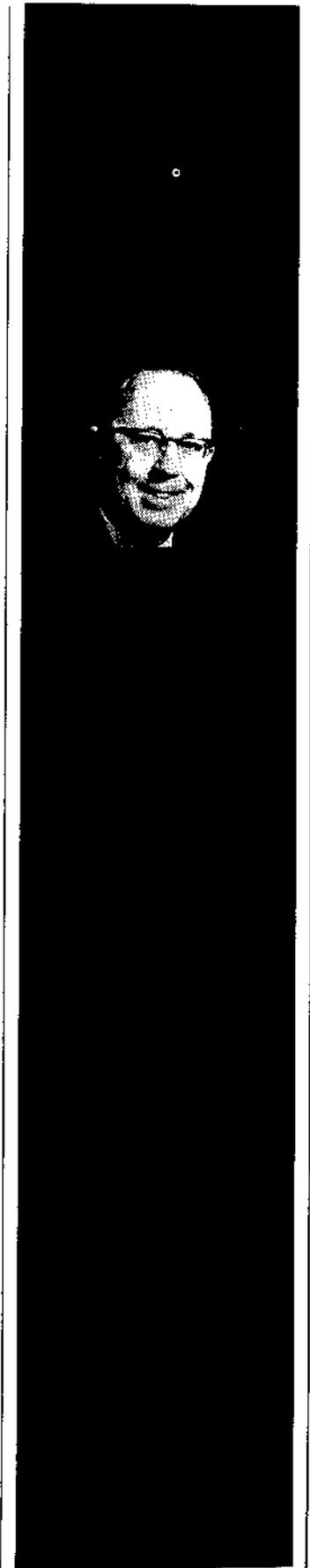
- moisture accumulated in systems using the new plastic or foam insulations cannot migrate into the assembly during periods of significant vapor pressure as well as it could in built-up systems using insulations such as perlite, fiberboard and fiber glass.

NRCA has written to EPDM and PVC manufacturers about the moisture problem and as a result, several of the manufacturers are now investigating this issue. TOC is also talking to Association members to determine the extent of the problem and is researching solutions. The moisture issue is also on the agenda for the May meeting of the joint NRCA/Single-Ply Roofing Institute (SPRI) Technical Liaison Committee.

In addition, two papers that will be presented at the Second International Symposium on Roofing Technology will address the moisture accumulation problem. The papers are titled "Field Survey of Moisture Gain Behavior Within Single-Ply Roof Systems" by Rene Dupuis of Structural Research, Inc., and "Roof Condensation Modeling of EPDM Single-Membrane Roof Systems" by Robert Walters of The Manville Corp. The Symposium will be held Sept. 18-20, 1985, at the National Bureau of Standards, Gaithersburg, Md.

The problem of fastener rusting and corrosion on metal decks has also been brought to NRCA's attention. The Roof Insulation Committee of the Thermal Insulation Manufacturers Association (RIC/TIMA) initially referred the fastener rusting problem to the joint NRCA-RIC/TIMA Roofing Insulation Committee in 1984.

RIC/TIMA reported that fastener rusting problems had been encountered in systems employing urethane insulation. The problems occurred most often in reroofing jobs. The group found that the fasteners that broke or rusted had not been coated. When these uncoated fasteners were exposed to moisture in the roofing system or condensation entering the roof from the interior of the building they were destroyed.



Several companies have started testing fastener coatings to find one that will make fasteners rust-resistant.

Both NRCA and RIC/TIMA discussed the problem with manufacturer representatives. As a result, several of the companies have started investigating and testing various types of fastener coatings to find a product that will make fasteners rust-resistant. In addition, several fastener manufacturers are working with SPRI's fastener subcommittee on a proposed procedure to test coated fasteners for rust-resistance.

We should be seeing results soon from these efforts to resolve the rusting and corrosion problem in new and reroofing jobs for both single-ply and BUR assemblies.

In 1984, NRCA received a letter from the Polyurethane Division of The Society of the Plastics Industry (SPI) about using open flame torches to adhere modified bitumen membranes. SPI had become concerned about the torching procedure after the use of an open flame on modified bitumen had caused a serious fire.

After studying this issue, RIC/TIMA prepared a paper titled "TIMA's Position on Torching Directly Over Foams." The Association has submitted the paper to NRCA for endorsement. The paper reads as follows:

There has been much discussion and confusion surrounding approvals and recommendations of the torching of modified bitumen membranes directly over isocyanurate and urethane foam insulations. With regard to torching of modified bitumen over these foam roof insulation products, TIMA *does not* endorse torching directly to the foam insulation material. Rather, it is recommended that an interim base ply or layer of roof insulation, acceptable to the membrane manufacturer, be used to separate the foam roof insulation from the modified sheet and the torch.

The membrane manufacturers publish varying specifications, and often the foam roof insulation manufacturer is asked to be the approval authority. This should not be the case; approval of insulation for use under modified bitumen roof systems is the responsibility of the membrane manufacturer.

TOC has informed RIC/TIMA that NRCA cannot take a position on torching modified bitumen directly to urethane until further investigation is done.

However, the Committee advised RIC/TIMA to contact modified bitumen manufacturers to determine their position on torch-applying modified bitumens directly to urethane or isocyanurate insulations. TOC further suggested that RIC/TIMA measure the temperature of the torched membrane as it is being laid as well as the temperature created by the torch flame during a torching operation. These measurements could be used to determine if the urethane could withstand the heat generated by the operation as long as it did not come in contact with the torch flame.

NRCA members have not reported any problems with torching modified bitumen directly to urethane insulation even though others say problems have developed. NRCA has heard that some contractors are mechanically fastening a base-ply sheet to the urethane to separate the insulation from the hot modified bitumen and the torch.

NRCA will be releasing a report on torching modified bitumen after it has completed its investigation of this issue.

Other single-ply problems that have been reported to NRCA include:

- solvents bleeding through elastomeric and plastomeric membranes at the joints, destroying EPS insulation below;
- seam separations;
- blow-off on ballasted systems;
- fatigue failures with non-penetrating mechanically attached roof systems;
- holes and blemishes caused by elements; and
- moisture loosening bonding adhesives.

We hope that the various investigations will help resolve many of these problems. Once these questions have been answered, the industry can concentrate on new roof designs and improve single-ply application procedures.