

The desired properties and characteristics of BUR materials have traditionally been described by "prescriptive" types of specifications, according to the National Bureau of Standards (NBS) Building Science Series 55 "Preliminary Performance Criteria for Bituminous Membrane Roofing" (BSS-55). The performance of the membrane itself has been considered only from a practical viewpoint, that is, by observation of its durability under in-service conditions.

Poor roof performance has often been attributed to the limits on the design, manufacture and application of roofing products imposed by prescriptive specifications, BSS-55 says. According to the document, these limits inhibit new product development and the introduction of innovative systems.

A number of prescriptive standards have been developed and published by the American Society for Testing and Materials (ASTM). ASTM's standards for roofing products set forth the agreed-upon physical properties that the products should possess at the time they are sold. In no way do they guarantee the performance of the finished roof or is there any assurance that the product will maintain the prescribed levels of performance after it is incorporated into a roofing system.

The groundwork for a more performance-oriented approach to roofing standards was laid in 1964 by a committee of the Building Research Advisory Board. The committee was formed to develop performance characteristics, appropriate testing procedures and suitable criteria for the acceptance of roofing systems in general for the Federal Housing Administration. It was chaired by NRCA Research Associate William C. Cullen, who was on the staff of NBS at the time.

The committee prepared a list of 18 characteristics deemed essential to the performance of a roofing system. It found, however, that adequate test methods were available to evaluate only a small portion of these characteristics. The committee also concluded that meaningful prediction of performance must take into account the components' interaction.

Since the committee published its findings, NBS has become active in the development of performance tests. In November 1974, the Bureau published BSS-55, which presented a slightly revised list of 20 attributes for the evaluation of BUR performance, including: tensile strength, thermal expansion, flexural strength, tensile fatigue strength, shear strength, impact resistance,

notch tensile strength, the effects of moisture on strength, creep, ply adhesion, abrasion resistance, tear resistance, pliability, permeability, moisture expansion, weather resistance, wind uplift resistance, fire resistance and fungus resistance.

BSS-55 also described test methods and criteria for 10 of these characteristics. However, criteria for the roofing industry as a whole must be established by the industry itself. For the criteria to be meaningful, it is essential that they be based on tests that can be conducted by well-equipped testing laboratories at a reasonable cost. The test results must also be reproducible. The proper way to establish these performance criteria is through a recognized standard-making body such as ASTM and not through a government agency such as NBS.

At the present time, there are industry-accepted test methods for four of these attributes. ASTM D2523 tests tensile strength; ASTM D3746 tests impact resistance; ASTM E84, E108 and E119 test flame spread and fire resistance; and ASTM E907 tests wind uplift resistance.

BSS-55 says that the establishment of acceptable performance criteria will provide a basis for the in-service evaluation of both established and innovative roofing systems and guide manufacturers in the development and production of roofing materials.

The development of performance criteria for bitumen BUR has been slow, and NRCA would like to see more progress in this area. Some groups are already working on criteria for other types of roofing. The Midwest Roofing Contractors Association took the lead in the United States and developed performance criteria for PVC, elastomeric and modified bitumen membrane systems. Internationally, the Joint International Committee on Elastomeric, Thermoplastic and Modified Bitumen Roofing is working to determine the current state-of-the-art standards, test methods and evaluation criteria that apply to sheet-applied single-layer roofing, and develop recommendations for performance standards for these materials.

We appreciate the initial efforts by these groups to establish performance criteria and we hope from these efforts all segments of the roofing industry will proceed jointly to develop the realistic and meaningful performance standards that the roofing industry desperately needs.

