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Wind Design Speeds vs. Wind Warranty Speeds - Statistical Facts or Hot Air?

In the roofing industry, there is a difference between uplift design wind speed and warranty wind speed. Even though roof systems have been specified for years to meet certain wind uplift standards, the ratings and how they are derived are still misunderstood and misused by designers and contractors.

Simply stated, Wind Design Speed is the wind velocity used to calculate and design the attachment of the roof system. Wind Warranty Speed is a wind velocity determined by a manufacturer as the upper limit for which the warranty will remain in effect. One value has nothing to do with the other. The correct Wind Design Speed and its use are mandatory requirements. The Wind Warranty Speed is only a number which a manufacturer offers to include in its warranty coverage. The wind speed to which a manufacturer will agree is based solely on the manufacturer's risk management data and loss history, or is a marketing tool to promote sales. Building owners and specifiers hope that by specifying a higher wind speed warranty, they will receive a more durable system. This is a false and dangerous assumption because the warranty wind speed offered by roofing material manufacturers does not guarantee that a roof is adequately designed for the building, site, and wind conditions of a specific project.

Wind Design Speeds are mandated by Code according to the locale and physical parameters of the project. Wind Warranty Speeds are established by the Architect/Designer and agreed to by the manufacturer. The higher the speed, the more expensive the warranty. When higher wind speed coverage is specified, additional enhancements may be required by the manufacturer to qualify for the warranty. When required, these additional enhancements will increase the cost of the total assembly and will increase the cost of the warranty being purchased.

To confuse the matter further, certain designations given by organizations such as UL or FM (1-60 or Class 90) do not correlate to any wind speed and only represent the uplift pressures which a particular roof design is able to resist.

The person responsible for performing the uplift calculation is the design professional, who should list the results in the architectural specification. Unfortunately, most specifications for roofing assemblies attempt to place the responsibility on the roofing contractor or installer, who typically is not an engineer or architect and who likely does not have the training or understanding of wind design. With the increasing tendency of architectural roofing specifications to make the calculations the contractor’s responsibility, the contractor is forced to request assistance from the roofing materials manufacturer or some other source. Ultimately, it is the legal responsibility of the Architect or Engineer of Record to determine the wind pressures acting on a building and to design the attachment of applicable components. Deferring to or using the data provided by a third party places the A/E/Designer in a precariously liable position.

Material manufacturers want to be as service-oriented as possible, so they generally will respond to these requests, do the calculations, and present the pressures for a given building roof area; but the prime responsibility for the engineering design rests with the project's licensed design professional. Each manufacturer, published criteria, or on-line calculator has its own limitations, and at best, it offers only guidance for the designer. The overall responsibility for confirming these results lies with the specifier through an engineer, architect, or other qualified design professional.

To assume this responsibility, to properly represent the Owner, and to correctly design the roof system, the design professional must understand and distinguish between Wind Design Speed and Wind Warranty Speed.