

Fire Protection Alternatives for Metal Buildings

Spray-applied Fire Resistive Materials and Intumescent Coatings Can Be Specified for Columns and Frames

When fire protection of metal building frames is required by the building code, the assemblies have historically been gypsum board enclosures, such as UL Design No. X524. However, a recent study, sponsored by the Metal Building Manufacturers Association (MBMA), determined that it is also feasible to use other common materials such as spray-applied fire resistive materials (SFRM) or intumescent coatings.

Nestor Iwankiw, PE, SE, Ph.D. of Jensen Hughes studied 180 single-story metal building designs that varied in span length, roof slope, and location in the continental United States. The weight-to-heated-perimeter ratio (W/D) values of the rigid frame members were determined for the metal building designs.

The results support the use of spray-applied products and intumescent/mastic coatings on metal building frames with a W/D of at least 0.30 lb/ft/in., the value for a W8x10 steel member. Several column assemblies, such as UL Design Nos. X632, X649, X772 and X829, have a minimum W/D of approximately 0.30 lb/ft/in.

An executive summary of the study is available at: <https://blog.mbma.com/blog/fire-protection-alternatives-for-metal-buildings-download-pdf-study-executive-summary>

If you have specific questions, contact the MBMA Engineering Department at 216.241.7333 or mbma@mbma.com.

By investigating W/D values of metal building frames, we demonstrated that alternative fire protection materials and products can be specified to accommodate various architectural schemes.



Fire protection using SFRM and intumescent coatings can be considered where a finished interior appearance with gypsum board is not necessary, such as industrial and warehouse buildings.



The minimum W/D should be specified for alternative fire protection assemblies, in addition to the structural criteria.