

WHITE PAPER



What are the Real Benefits of 6mm vs. 4mm MCM

OVERVIEW

Aluminum Composite Material (ACM) also goes by the name of Metal Composite Material (MCM) in many specifications and was introduced into North America from Europe in 1979. The original intention was to provide a product that had the appearance of plate, however was easier to fabricate and added far less weight to the exterior wall cladding.

During the 50 years of use in architectural construction the most common material thicknesses have evolved into 4mm and 6mm thickness regardless of the core material chosen. 4mm MCM is primarily specified and used in a vast majority of architectural projects due to benefits in the areas of cost, fabrication, design, and performance. 6mm MCM was originally introduced as an alternate to spandrel infill panels (1/4" monolithic glass) and is also available. 6mm MCM is used far less frequently as the marginal benefits in stiffness are very limited. This white paper will highlight many of the real and perceived benefits to using one thickness over another, 6mm MCM versus 4mm MCM, looking through the eyes of the manufacturer, designer, and fabricator.

DISCUSSION

The most demanded thickness, 4mm MCM, is available from all of the MCA MCM manufacturers and is generally considered the industry standard for architectural construction. From the fabricator perspective, 4mm MCM is the preferred thickness for architectural projects since the vast majority of equipment is set up to fabricate 4mm and many of the installation systems are designed to have the panel return leg engaged in a pocket designed to accept and protect a product of this thickness.



4mm MCM is also the primary product chosen by the design community as this thickness generally provides the most flexibility in choice of core material, standard versus fire resistive, and allows the greatest choice between panel manufacturers.

Historically, the primary benefit of 6mm MCM was that it could be used in common curtainwall/glazing applications where the same glazing materials could be used for both 1/4" monolithic glass and 6mm MCM. Since then, 6mm MCM has predominantly been replaced by other materials that are used in infill applications. While there remain certain applications that can benefit from the additional rigidity of 6mm MCM, panel systems primarily utilize aluminum stiffeners evenly spaced behind larger panel applications that minimize the amount of visual deflection to an acceptable level.

From the perspective of the panel manufacturer, 4mm MCM is considered the industry standard which is reflected in the significant volume difference in the amount of 4mm and 6mm material manufactured each year. While several manufacturers have the ability to produce both 4mm and 6mm material using the same production equipment, the vast majority of product provided for architectural construction is 4mm MCM as there are few if any performance or specification benefits provided by the added product thickness. 6mm material remains an option for certain projects, however material costs and production lead times often significantly limit the project specification to 4mm MCM. Certain manufacturers have actually suspended production of 6mm MCM due to limited demand.

From the perspective of the architect, there are two driving elements to product choice: performance and cost (not necessarily in that order). The design community has found that the difference in thickness does not provide a perceptible improvement in panel flatness and that the added panel weight may actually be a detriment when designing the support system required to mount the panels. Fire performance is also a key issue and many of the MCM manufacturers have chosen to focus on 4mm MCM as the thickness of choice for the development of fire resistive panels that may be included in a system that meets the performance criteria of NFPA 285.

Finally, from the perspective of the fabricators, there also does not seem to be overwhelming reasons to use 6mm MCM in lieu of 4mm MCM. The 6mm panels present a heavier panel to be handled during the fabrication process and, as stated earlier, not all attachment systems will accept the option of either 4mm or 6mm MCM. Those perimeter extrusion systems that provide a receiving pocket to protect the edge of the panel are generally designed to accommodate a single thickness and provide the clean finished edge look that designers desire. Both panel thicknesses require a similar type of stiffener systems and the difference in thickness does not generally provide a benefit of less stiffeners due to the panel thickness that offsets the labor and costs required for complete system fabrication. Finally, the additional panel weight translates into higher shipping costs and often less finished panels per skid.

SUMMARY

While there are no clear significant benefits to the use of 6mm MCM compared to 4mm MCM, the fact is that 4mm MCM has been accepted in most architectural applications as the product of choice over the past 30 to 40 years. However, if demanded, there are outlets where a designer can obtain 6mm MCM.

All of these issues though appear to often be secondary to the overall cost of the MCM panel thickness for a particular project. The limited flexural benefits of a 6mm MCM system do not offset the material, fabrication, and installation costs compared with a 4mm MCM system that provides relatively equal performance in the eyes of the owner and the design community.

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