

Attribute	Single Skin	IMPs	ACMs	MCMs
Description	Single skin panels are interlocking metal panels that can be custom designed to different shapes, which may include square, rectangle and diamond. They can be fabricated in any kind of metal from prefinished materials to natural metals, such as copper or zinc.	Insulated metal panels have an insulating foam, such as polyurethane, injected between two aluminum or steel metal face panels to form solid sandwich panels.	Aluminum Composite Material panels consist of two thin aluminum sheets bonded to a non-aluminum, usually low-density polyethylene core.	Similar to ACMs, metal composite material panels have two metal skins bonded to a highly engineered plastic core placed between them, creating a "sandwich" panel.
Durability	With coatings that help fight corrosion and fading, single skin panels can last several decades. However, since these panels are generally less rigid, they are more susceptible to damage, especially near ground level. Designers will use brick, stone and other reinforcement to improve durability and add texture to the overall building envelope.	Stronger than single skin. Provides structural capacity compared to standard metal roof and wall panels, allowing fewer structural steel supports due to greater load-bearing capabilities. Resilient to abuse. Provides a thermally efficient building envelope with industry-leading R/U-values and air tightness as compared to traditional site-built systems.	Highly durable. Tested to ensure that they meet building codes. Testing standards include ASTM E330, 331, 283, 284, 1996 and 1886. Offer overall longevity and life expectancy, with minimal building maintenance cost.	Low impact strength. Due to their light weight, reduce structural requirements and the consequent costs. Are extensively tested for compliance with various industry standards and building safety codes.
End of use issues-recyclability	Easily collected, recycled and reused, from either production scrap or at end-of-product life, making them 100 percent recyclable. No secondary materials must be separated for recycling like polyurethane foam, polyethylene or plastic.	Steel facers are recycled and recyclable; foam is reusable.	100 percent recyclable.	100 percent recyclable.
Weather-tightness	Can be installed in almost any environment and weather condition without compromising the panels. They have interlocking joints that has factory sealant applied to ensure weather-tightness.	Panel interlocking joint design prevents water infiltration. Double tongue-and-groove side joints coupled with butyl sealants yield extremely airtight and watertight products.	Water resistant and can stand up to extreme weather conditions.	Can be fabricated with a dry joinery system, reducing the opportunity for water infiltration. Wet seals are eliminated, providing the optimum venting that keeps moisture out and allows wall cavities to dry effectively. This reduces the chance of mold, material degradation and mildew.
Maintenance	Single skin metal wall panels are easier to install and economical to maintain. For example, if a metal panel is damaged, only the panel itself would need to be replaced. Most have 20-year warranties on paint and substrate. Periodic re-tightening of through-fasteners is generally required. Periodic wash downs of coating may be required in coastal environments.	Virtually maintenance free. Paint and substrate are warranted for 20+ years. Most manufacturers offer a minimum two-year craftsmanship warranty against defects. When IMPs need to be replaced, the panel assemblies and insulation backers require replacement.	Easy to maintain. ACM panels should be cleaned on a regular basis. This cleaning's timing depends on the location of the building, and the amount of dirt and pollution in that area. A general rule is to clean the panels when the windows are being cleaned.	MCMs require minimal maintenance. Ongoing maintenance costs are reduced as a result of continuing improvements in paints and coatings. Today's metal composite material panels retain luster for decades.
Formability	Highly customizable. Fabricated from light-gauge materials. Easier to custom fabricate with interior and exterior corners than other wall panels. A wider selection of single-skin profiles are available to choose from because of forming technology advancements. Pre-cut, multi-pass roll forming allows for relatively simple production. Small orders are easily filled.	Relatively complicated manufacturing process. Continuous line utilizing two multi-pass roll formers for the interior and exterior skins. Roll-forming is a small part of the total progression. Post-cut process.	Extraordinary flatness and rigidity, excellent formability. Can be fabricated in very complex geometric shapes including curves and ellipses. When installed correctly, material remains very flat.	MCMs offer crisp bend lines and they can be radiused if necessary. Can be formed into various bent and irregular shapes for diverse geometric configurations.
Green issues	Outstanding green attributes, environmentally responsible and sustainable choice for buildings. Other than the paint compounds, there are no other products within the panel derived from fossil fuels. Cool coatings help reflectivity and emissivity.	Insulated metal panels are also an environmentally responsible and sustainable choice for buildings. Extremely high R-values make it a green product.	ACMs are also an environmentally responsible and sustainable choice for buildings. They consist of an average of approximately 85 percent recycled aluminum content.	An environmentally responsible and sustainable choice, manufactured using recycled content and HCFC-free foam insulation.

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Types of applications	A variety of profiles to meet design and strength needs. Best for projects requiring small batch custom finishes. Can be used in a multitude of applications including metal roofs, soffits, screen walls, fascia panels and interior panels. Can be installed vertically or horizontally. Can be shaped to fit the radius of curved walls. Most often used for warehouses, manufacturing and industrial facilities, stores, schools or office buildings. Interesting interior design applications. Perforated single-skin wall panels are now being used for functional applications such as equipment screens.	Used for all horizontal/vertical wall, roof and cold storage applications in many diverse architectural, institutional, commercial and industrial applications.	Fascia, roof, soffit and interior panels, canopies, ornamental applications, screen walls and a variety of additional applications. Seen on retail stores, office complexes, healthcare facilities, schools, and multi-family residential buildings.	Rainscreen cladding systems (ventilated façades). Infill panels for curtain wall systems. Exterior building cladding. Flat, curved and multi-geometrical design elements such as soffits, cornices, windowills, column covers, beam wraps. Cladding for balconies and tunnels
Installation costs	Single skin panels have low installation costs due to simple trim designs, light weight, long panel lengths (reduced fastening points) and large panel coverage. They can be cut to length and bundled in the factory reducing field labor to cut panels.	Lightweight panels and simplified fastening systems produce less expensive installation costs.	Some ACM panel manufacturers are eliminating protective backer materials, such as plywood or concrete, for quicker installation, decreasing installation cost.	The material used, panel thickness and system type such as face-sealed, face-fastened or rainscreen (drained/back-ventilated or pressure equalized) affect cost considerations. With or without exterior insulation (R-value) affects installation costs.
Ease of installation	Can be installed in less time with less cost than other metal panel systems. Lighter weight compared to other metal wall panel types, making them easy to handle and install. Other wall panel types are of a bonded construction which develops a very rigid panel assembly. Single skin panels are more flexible and often allow for slight installation adjustments to keep panel installation on module or cover modest substrate inconsistencies.	Factory assembled and ready to install for faster site installation. Installs 50 percent faster than single skin due to fewer required supports, greater coverage, superior spanning capability and fewer fasteners. Installs with less trades as opposed to site-built systems. Product must be handled with extreme care. Spreader bars and vacuum lifts are almost always required.	Different installation methods and multiple installation systems to maximize project designs and budget constraints. Common installation techniques include: rout and return dry seal, rout and return wet seal, rainscreen and extrusion.	Initial construction costs are often lower with metal composite materials because the panels can typically be installed faster than alternative exteriors such as precast, granite or brick. They can also be installed non-sequentially. Because of their light weight, MCMs can also save money by reducing structural steel requirements, since less support structure is needed.
Training issues	Any training issues would be the same as other metal wall panel types. For single skin metal panels, it may be slightly easier to educate installers due to reduced product complexity.	Certified installer training is readily available. Cold-storage industry has many well-trained and experienced installers. Commercial/industrial industry has fewer qualified installers relative to the single skin industry.	Training and technical support is offered to assist installers.	Training and technical support is offered to assist installers.
Shipping and storage	Through-fastened panels nest nicely and are easily shipped. Can be ordered cut to length from the manufacturer and shipped directly to job site. Panels ship very well and are bundled to the installer's criteria. If panels are stored for an extended period of time they should be tarped to remain dry and clean. Strippable films must avoid direct sunlight.	Relatively inefficient and expensive to ship (ship a lot of air). Not a lot of weight on a trailer, just volume. Less square footage fits on a truck compared to single skin. If panels are stored for an extended period of time they should be tarped to remain dry and clean. Strippable films must avoid direct sunlight.	If panels are stored for an extended period of time they should be tarped to remain dry and clean. Strippable films must avoid direct sunlight.	If panels are stored for an extended period of time they should be tarped to remain dry and clean. Strippable films must avoid direct sunlight.
Finishes and colors	Can have a smooth or embossed surface. Available in a variety of finishes and coatings because of coating technology advancements. Specialty prints resemble a natural rustic finish. Textured coatings that resemble a light stucco finish. New paint systems resist chalking and fading, and withstand corrosive and marine environments.	Many color possibilities, but these options may be limited for extremely hot or cold climates.	Can be painted in a variety of different colors and glosses. When painted with Kynar 500, a 20-year warranty on the panel finish is provided. Depending on the color, panels are also available in smooth or stucco-embossed finish. Colors can be solid two-coat colors, metallics and Mica finishes. Ideal for corporate identity projects where custom colors are required to promote the brand identity.	They come in standard and custom colors, and a variety of finishes. Sheet suppliers have their own color palettes, which allow for a variety of options.
Overall appearance	Can be made from Galvanized steel, Galvalume steel, aluminum and stainless steel. Thickness can range from 24-18 gauge. Can be 6 to 36 inches in width and can be as long as 45 inches in length. Stiffening rib and vent patterns options are available. Ribs can run vertically or horizontally. Available with both exposed and concealed fasteners, various gauges, stucco embossed or smooth finishes. Many options and great flexibility can create visually stunning exterior facades that will last many decades.	Many versatile aesthetic and design flexibilities with various profiles. Available with concealed fasteners. Some design flexibility limitations due to the insulated core. Composite nature all but eliminates oil canning. Panels can be oriented vertically or horizontally.	Crisp, smooth panels with a flat surface free from oil canning. Composite panels can be found in thickness ranging from 2 mm to 6 mm. Coil widths can vary from 39 to 62 inches. Standard material lengths are 120, 122, 146 and 196 inches. Custom lengths can be ordered with minimum quantities. A modern look that can complement other cladding materials. Many different design options.	Options include caulked, dry gasket/gasketed, spline joint and AAMA pressure equalized varieties. Many design options. Diverse lengths and wide widths; panels are available in widths up to 60 inches and custom lengths up to 180 inches. Smooth panels with a sleek, flat design that offer sharp, crisp sight lines. No oil canning or wrinkling because the skins are bonded to the core under tension, which produces a balanced panel.