

Project Report

Metea Valley High School

Aurora, Illinois



Photography: James Steinkamp

Architecture: DLR Group

KALWALL

high performance translucent building systems

KALWALL SPECIFICATION:

Panel: 2.75" | 70 mm

Grid core: Vertikal™

Exterior FRP: white

Interior FRP: white

System finish: bone white #21b

U-Value: .29 | 1.56 Wm²K

Solar Heat Gain Coefficient: 0.23

Visible Light Transmission: 15%

WHAT IS KALWALL?

A translucent, structural sandwich panel that provides:

Glare-free, balanced daylighting

Superior thermal performance

Energy + electricity saving

Low maintenance life cycle requirements

Safety + security through visual privacy

Durability + graffiti / vandal-resistance

Hurricane, explosion venting + blast rated options



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For unparalleled thermal performance in translucent daylighting, consider specifying Kalwall with **CABOT's Lumira®** aerogel insulation. Available in 2.75" (70 mm) panel formats up to: 4' x 12' (1200 mm x 3600 mm) and 5' x 10' (1500 mm x 3000 mm) maximum.

Metea Valley High School

From the beginning, architects DLR Group designed Metea Valley High School in Aurora, Illinois, to light up education, both literally and figuratively. The sprawling campus with room for 3,000 students is broken down into a handful of more intimate, human-scale learning spaces, called "think tanks", where interaction with faculty is encouraged. Two interior courtyards, open to the sky, offer fresh air during free periods. Shaped a bit like a bow tie, Metea combines three concepts – mind, in the midsection, and body and soul on either end – to offer students a truly 21st century school experience.

Lighting up Metea in the literal sense comes largely from the extensive use of Kalwall translucent curtain wall throughout the school. Upon coming through the school's main entrance, visitors are struck by the cheerful, airy, daylighted lobby. Controlled daylight also pours into the school's innermost areas, traditionally a structure's darkest, from the courtyards. Kalwall introduces daylight into the vast commons area that serves as the students' lunchroom. In the gymnasium, Kalwall's shadowless, glare-free light enhances ball handling in team events; sunlight does not glance off the shiny court surface. The diffuse-light-transmitting panels also prevent glare off computer screens, easing eyestrain. And in a dramatic demonstration of Kalwall's superb flexibility, the design includes occasional, narrow, horizontal runs of clear glass – some serving as clerestories – adding visual interest as well as clear views to the outside.

At 464,000 square feet, Metea could have been an energy-consumption nightmare, adding significantly to its \$125 million total project cost. But innovations such as demand control ventilation, energy recovery wheels, and high efficiency boilers will save Indian Prairie School District 204, the state's fifth largest, thousands of utility dollars every year and pay for themselves in just a few years. In fact, the building's design is targeted to be 19 percent more efficient than ASHRAE 90.1 requires. Because translucent Kalwall admits so much controlled daylight, the school's exterior light harvesting system, which monitors indoor light levels, can actually turn off electric lights in public spaces automatically when they are not needed. The harvesting system alone is expected to save the district over \$21,000 a year in operational costs with a payback of under seven years.

Illinois can get very cold in the winter and quite toasty in the summer. Highly insulating Kalwall helps there, too, keeping temperature extremes outside and lessening the need for and cost of heating and cooling. During the manufacturing process, standard 2-3/4" and optional 4" Kalwall sandwich panels can be infilled with various densities of specialized, translucent insulation. Architects and designers can achieve a thermal insulation value of up to R-20 (0.05 Btu/hr/ft²/F).

At Metea Valley High School, DLR Group chose to include Vertikal™, a unique design variation on the standard shoji or square grid layouts of Kalwall Translucent Systems. The panels incorporate internal, continuous supports to provide a vertical emphasis. As with all Kalwall translucent systems, Vertikal distributes diffused daylight throughout the school, even on cloudy days, drastically reducing the amount of artificial lighting required and eliminating shadows and glare as well as stark contrasts of light and shade. Vertikal can be supplied in panels up to 5 ft. (1.5 m) wide and up to 12 ft. (3.6 m) high, minimizing the number of joints. The unique format creates an entirely different look while still utilizing the most highly insulating, diffuse-light-transmitting, structural composite technology.

Any school system must concern itself with maintenance costs, and Kalwall excels there as well. The panels are vandal-resistant and self cleaning; dirt simply washes off with each rainfall. After dark, the diffuse, translucent properties of Kalwall contain interior lighting and prevent direct-beam light pollution. Instead, the exterior surface of the building simply glows beautifully, boosting Metea Valley High School's aesthetics and welcoming both students and the surrounding community to a true masterpiece of daylighting.

