ViewScape 30%

SUSTAINABLE BUILDING SOLUTIONS

Mohit Mehta, Building Performance Team Leader at ME Engineers and Steve Sorrentino of Madico, Inc., discuss the latest trends in stadium roofing.

ME Engineers has earned a reputation as a global leader in the design of innovative MEP systems that bring to life the world's most innovative sports and entertainment venues.

Since 1981 ME Engineers has completed over 200 projects across the globe and has authored technical reports and standards for the **NBA, NHL, MLB,** and **MLS** in the U.S. and **FIFA, World Cup Cricket**, and the **Olympics** worldwide.

Mohit Mehta leads the Building Performance team at ME Engineers and works with design teams from concept through construction to set goals and develop a framework for incorporating sustainability strategies into all aspects of a project's design.

The central study areas are energy, daylight, and airflow modelling.

Engaged in design research and analyses for high-performance buildings for 20 years, Mohit is knowledgeable in environmentally responsive building practices, materials, and site designs that promote comfortable, energy and resource-efficient, healthy buildings.

He has lectured and written on the integration of energy and sustainable design principles into urban and building design and has undertaken research on a variety of climate-adaptive strategies, including facade optimisation, daylight and shading analysis, airflow visualisation, thermal comfort, and optimisation of building systems.

Steve Sorrentino, of **Madico, Inc**. met with Mohit recently to learn more about how thermal considerations play a part in today's building designs.

Madico, Inc. is a 120-year-old industry-leading USA manufacturer of laminating and coating solutions providing high-performance films for the building, automotive and aerospace industries.

ViewScape is an innovative new material that has recently become available. ViewScape was developed specifically to address current and emerging trends in stadium design.

Compared to conventional foil materials commonly used today, ViewScape offers superior clarity, improved mechanical strength, and enhanced solar performance.

The clarity and solar properties of ViewScape reduce demand for lighting and cooling energy, making it an ideal product for clients who seek more environmentally responsible venues.

Steve quizzed Mohit about trends in roofing design.

What high-level trends are you seeing in the roofing designs of stadiums?

Most large sporting venues today are being envisioned as multi-purpose. Roof types and materials are dependent on the sport (interrupted by weather or not) and the playing surface i.e., whether it's grass or artificial turf. But regardless of roof design, fixed or movable, transparent, translucent, or opaque, they are all trending towards lightweight, long span and free-standing solutions.

What are the limitations of current roofing products in the marketplace?

While it's easier to meet building

VLT compared to 63% Fritted ETFE

85% Fritted ETFE

energy code-required thermal values, opaque and hard deck roofs, fixed or movable are relatively heavy, require more structural support and take longer to open and close.

The typical lightweight options we are currently seeing are polytetrafluoroethylene (PTFE), which is a synthetic fluoropolymer of tetrafluoroethylene, and ethylene tetrafluoroethylene (ETFE), which is a fluorine-based plastic in a single layer or cushion configurations. However, in an enclosed and climate-controlled bowl, it can be a challenge to comply with the building energy codes in North America due to their lack of adequate thermal properties.

How does Viewscape by Madico compare to other incumbent materials (fritted ETFE, and PTFE fiberglass) in the marketplace?

From a heating, cooling, and ventilation (HVAC) perspective – ViewScape offers superior thermal properties (U-value/factor and solar heat gain coefficient (SHGC) primarily) that are controllable and customisable without compromising transparency, which is desired by many designers and clients. While ETFE can be fritted to various degrees of coverage to reduce the SHGC, it starts to lose transparency with a higher density of frit. Similarly, the insulating value (the U-factor) of an ETFE skin is improved by going with 2, 3, and even 4-layer inflated 'cushion' assemblies, while ViewScape can match these lower values with a single clear layer.

What is solar heat gain coefficient (SHGC), and why is it important?

Simply put SHGC is the percentage of solar gains that a fenestration allows into the space.

The lower the SHGC, the less solar heat it transmits and the greater its shading ability. Depending on venue/space type, climate, orientation, and surface area of fenestration (vertical, horizontal, or angled), being able to customise this property allows us to optimise the design of the HVAC system. In addition, we can better manage the thermal comfort of the spectators in the seating bowl and athletes on the field of play (FOP), which we quantify by standard effective temperature (SET) and wet-bulb globe temperature (WBGT) respectively.

How does reducing solar heat gain reduce HVAC requirements in a stadium?

SHGC is one among a slew of values and criteria that are considered by us as we arrive at load calculations, system selections, seating bowl airflow numbers, duct sizes, etc.

As if these were not enough, SGHC also has secondary impacts on spectators' and athletes' visual and thermal comfort as mentioned above.

That being said, based on studies we have conducted, lower SHGC values usually result in better performance, lower bowl cooling loads (tons), bowl airflow (CFMs), annual energy costs as well as HVAC construction costs, in most climate zones.

ViewScape is the next generation of enclosure technology

How important is it for engineers to get involved early in the design process of a project.

For the numerous reasons listed in the responses above – it helps the client make informed decisions on whether to pursue ViewScape or go a different route. And if they decide to proceed with ViewScape, what other areas of investigation the design team needs to consider and solve for is preferable earlier in the design process.

What would it look and feel like in a stadium using ViewScape as the roofing material?

This is a good question! There is no example of the scales we are talking about so the answer is unknown. The small-scale mock-ups provide a feel like looking through a pair of sunglasses during the day.

In some specific instances, we would need to evaluate for acoustics (rain and internal noise reflections), glare – any internal reflectivity concerns i.e., the potential impact of broadcast and event lighting. Finally, external reflectivity of the lower SGHC configurations, especially if the venue is in a flight path.

What types of projects would you see best suited for ViewScape?

Large stadiums, with and without climate-controlled seating bowls, open-air sporting venues with shade canopies over the seating areas, sports training facilities, and any large assembly spaces that do not need to be in blackout mode during daytime hours would be good candidates for ViewScape.

In fact, any sporting venue where there's a desire to maximise daylight, blur the difference between indoors and out, manage infrared radiation and keep the elements out, providing comfort for everyone under it.

Are there any past projects in which you would have used Viewscape had it been available then?

It's difficult to say as there are several motivations that influence the selection of materials, especially for something as expansive as the roof. In addition, not every venue is looking to have a fully transparent roof.

Where they are, I can envision ViewScape in several recent sporting venues we have delivered worldwide, from MLB ballparks to NFL stadiums in the U.S. and soccer stadiums in cooling-dominated climates. ■

ViewScape is currently available and is being explored on multiple sports venues globally. Material is supplied in rolls for large panel fabrication or panelised inside aluminium extrusions for more conventional façade and skylight applications.

For additional information, visit viewscape.madico.com.

Clarity With Solar Heat Control

ViewScape™
BY MADICO

Thermal Control

Structural Strength

Clarity

Customizable

The Next Generation of Roofing Technology.

ViewScape is the ideal option for thermal control roofing when guest comfort and views are top priority. Reduce unwanted heat while saving energy costs with the first transparent, daylighting roofing technology.

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Madico, Inc. is a 120-year old industry-leading, USA manufacturer of laminating and coating solutions providing high-performance films for the building, automotive and aerospace industries.

viewscape@madico.com

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