

## CASE STUDY

### Performance Reaches New Heights



#### Dedmon Athletic Center - Radford University, VA

Project:	Retrofit of roofing system - mixed use facility
Architect:	Moseley Architects, Virginia Beach, VA
Engineer:	Stroud, Pence & Associates, Virginia Beach, VA
Contractor:	Branch & Associates, Roanoke, VA
Owner:	Radford University
Plan area:	54,804 sq ft / 5,090 m <sup>2</sup>

#### RESULTS:

Energy savings:	\$91,500 / €64,200 per year*
CO <sub>2</sub> emission reduction:	1,988,800 lbs / 904,000 kg per year**
Aesthetics and comfort:	Retrofit maintained the iconic roof structure while exponentially improving user experience through sound dampening, moisture resistance and thermal insulation.

The original air-supported fabric roof of the Dedmon Center was replaced with with a Lumira™ aerogel fabric layer sandwiched between two layers of structural PTFE fabric, creating ultra-high insulation levels. The fabric is less than 50mm thick, yet it more than triples the original roof's thermal insulation performance with a value of R-12 (U-value 0.47 W/m<sup>2</sup>K) and natural light transmission value of 3.5%. The results of the completed roof retrofit were measured through IR imaging (see inset above). On a cold winter night, the cool temperature of the arena roof (A) is readily apparent as compared with the adjacent traditionally insulated roof (B) and the natatorium fabric roof (C) which was constructed similarly to the original construct of the arena roof, with 2 layers of fabric. When measured, the ambient exterior temperature was 26°F (-3.3°C) and the interior temperature of the space was 68°F (20°C). The surface temperature of the arena roof was 28°F (-2.2°C) and the surface temperature of the rest of the facility roofs averaged 66°F (19°C).

\* Calculated according to Fourier's Law of thermal conduction (integrated)

\*\* Carbon calculations based upon the following formula: 1kWh=.537kgCO<sub>2</sub>