

Simulation Drives Thermal Performance Standards for Metal Building Insulation Systems

Founded in 1938, Owens Corning is a world leader in building materials systems and composite solutions, delivering a broad range of high-quality products and services. Owens Corning products range from insulation, roofing and manufactured stone veneer used in residential, commercial and industrial applications to glass fiber that reinforces composite materials used in transportation, electronics, marine, wind energy and other high-performance markets. Owens Corning has been a Fortune 500 company for more than 50 years.

TECHNOLOGY USED

ANSYS® FLUENT®, GAMBIT®, ANSYS® POLYFLOW®

CHALLENGES

The Metal Building Insulation (MBI) industry as a whole is currently seeing the need to revise insulation performance standards. As a leading member of the MBI industry Owens Corning used ANSYS FLUENT software for developing thermal performance factors for MBI assemblies.

The analyses involved numerical modeling of three-dimensional flow and heat transfer problems in insulation assemblies used in the metal building industry. The geometries are complex and the assemblies include several materials with very different thermal conductivities and narrow pockets of air where natural convective currents could potentially form. Slight variations in the overall heat transfer rates can make significant impact in the long run and hence the roof-insulation fastening mechanisms have to be carefully designed for optimal performance.

ENGINEERING SOLUTION

Owens Corning has used ANSYS products and services for many years and found them to be valuable resources

- The geometric model was developed in AutoCAD® from Autodesk, Inc.
- GAMBIT helped to generate a good quality mesh
- ANSYS FLUENT calculated the solution of the conjugate heat transfer problem
- Subsequently, post-processing evaluated the overall heat transfer coefficient for these assemblies and analyzed the dependence of heat transfer coefficient on geometry and materials parameters

BENEFITS

Owens Corning generated results that helped to define thermal performance standards for metal building insulation systems. A validated model reduces the need for physical prototyping and leads to reduced costs as well as shortening the time to accomplish newer higher standards.

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COMPANY INFORMATION

Country: U.S.A.

Industry: Fiber Glass Insulation Products

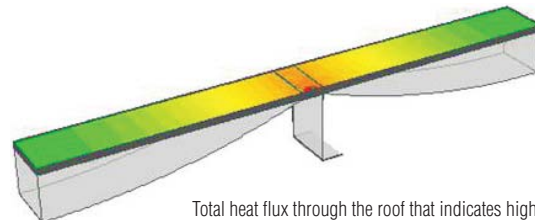
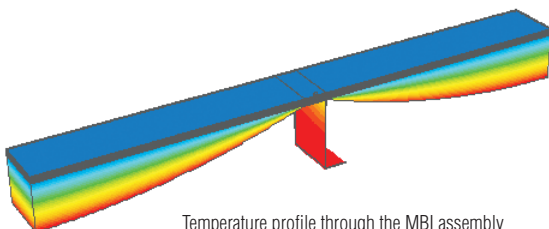


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“ We chose solutions from ANSYS for the excellent track record of their products and for their extraordinary technical support. Over the past 15 years, the numerous individuals I've interacted with have gone beyond the call of duty to help us out. We at Owens Corning consider ANSYS to be a valuable partner for projects involving CFD analysis.”

Dr. Manoj Choudhary
Senior Technical Staff
Owens Corning



CASE STUDY