

Thermal Performance of Spandrel Assemblies

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Problem Addressed



- Spandrel assemblies are opaque areas of curtain walls used to hide building components and insulated to improve thermal performance.
- Thermal performance of spandrel assemblies are typically modeled and are uncertain because of thermal bridging, with up to 70% variation predicted from different simulation tools.

Current Research

- Experimentally evaluate the thermal performance of spandrel assemblies in ORNL's heat, air, and moisture (HAM) chamber.
- Control air velocity to ~0.6 mph (indoor side) and 5 mph (outdoor side) to mimic natural conditions for

(Left) Spandrel assembly and (right) modeled thermal performance



convection. Controlling air film coefficients is critical when evaluating systems with poor thermal performance.

 Record temperature at ~200 locations during steadystate experiment to assess impact of thermal bridging.

Major Impacts

- Detailed experimental data were generated for model calibration to improve the prediction of spandrel assembly performance.
- Improved models can be employed to design more efficient spandrel assemblies.

HAM chamber





P

RDH

SGH

(Left) Sensor layout and (right) sensor installation

Indoor baffle air temperature



Air temperature 3 inches from the article surface (left) indoor side and (right) outdoor side

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