

**DASMA-Sponsored Research**  
**Garage Door and Rolling Door U-factor Testing and Simulation**  
**Project Overview**  
**April 2007**

Scope

The DASMA Commercial & Residential Garage Door Division and the Rolling Door Division each sponsored testing and simulating of U-factors for certain sectional garage door and rolling steel door specimens.

Four sectional garage door specimens were tested and simulated for U-factor, two specimens of which were similar to those involved in ASHRAE research project RP-1236. One rolling steel door specimen was tested and simulated for U-factor, which was similar to the specimen involved in ASHRAE research project RP-1236.

Purpose

The purpose of the project was to develop data as well as to compile departures from NFRC 100 and NFRC 102, for the purposes of comparing with results from RP-1236.

Objective

The objective of the research project was to compile data and information to contribute toward the work being done within NFRC to establish suitable and repeatable means of testing and simulating U-factors for garage doors and rolling doors.

Background

For a number of years, certain parties outside the garage door and rolling door industries have been interested in the U-factor performance of garage doors and rolling doors. Two different test methods have existed in order to determine U-factor; one based on measured surface coefficients (provisions of which have been incorporated into both ANSI/DASMA 105 and NFRC 102) and one based on standardized surface coefficients (incorporated into NFRC 102.) An ASTM document, designated as E 1423, also exists that roughly parallels the content of NFRC 102.

In 2003, ASHRAE began research project RP-1236 intended to test and simulate U-factor values for various door products, including certain sectional garage door and rolling steel door products. The final report for the project was issued in early 2007. DASMA participated in a subcommittee that monitored the project. The ultimate objective of the project was to develop default U-factor matrices for a wider spectrum of door products for inclusion in the ASHRAE Handbook of Fundamentals, for design/analysis use primarily by energy contractors and other related professionals. DASMA has great concern about the results from RP-1236 regarding 1) the relationship of  $U_s$  values to  $U_{st}$  values, 2) the means by which simulated U-factors “validated” tested U-factors, 3) the relationship of non-insulated product U-factors to basic air film coefficient values, and 4) the comparison of ASHRAE project values to data DASMA separately obtained on similar products.

In order to assure industry participation in the process, the DASMA Technical Director assumed the role as chairman of an NFRC task group on garage door and rolling door U-factors. The express objective of the task group has been to recommend the most suitable and repeatable provisions for testing and simulating U-factors for garage doors and rolling doors. In order to work toward achievement of the objective, the task group would need to agree upon a detailed description of departures from NFRC 100 and NFRC 102, make recommendations regarding

proposed changes to those documents, and make recommendations regarding correlating the content between ANSI/DASMA 105, NFRC 102 and ASTM E 1423.

Comparison between ASHRAE research and DASMA research will be handled via separate documentation.

### Project Specimens

1. Non-insulated rolling steel door, 10' x 10'
2. Non-insulated, non-thermally broken sectional garage door, 10' x 10'
3. \*Insulated (1 3/8" polystyrene), non-thermally broken sectional garage door, 10' x 10'
4. Insulated, thermally broken sectional garage door, 9' x 7'
5. \*Insulated, thermally broken sectional garage door, 7' x 7'

\* Alternative not included in the ASHRAE research project

### Project Contractors

Testing: Architectural Testing, Inc., York, PA  
Items 1-4 above  
Contact: Mike Thoman

ETC Laboratories, Inc., Rochester, NY  
Item 5 above  
Contact: Sam Yuan

Simulation: ETC Laboratories, Inc., Rochester, NY  
All items above  
Contact: Gurjinder Singh

### Attachments

1. Test report for 10x10 rolling steel door
2. Simulation report for 10x10 rolling steel door
3. Rolling door simulation steps documentation
4. Test report for 10x10 non-insulated, 10x10 insulated and 9x7 insulated garage doors
5. Simulation report for 10x10 non-insulated garage door
6. Simulation report for 10x10 insulated garage door
7. Simulation report for 9x7 insulated garage door
8. Test report for 7x7 insulated garage door
9. Simulation report for 7x7 insulated garage door
10. Garage door simulation steps documentation