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Application Manual for Air Curtains

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1. Purpose

The purpose of this application guide is to familiarize the reader with air curtain unit (ACU) technology.

2. Scope

This document covers ACU theory, construction, performance standards, applications, benefits, selection, installation, commissioning, service and maintenance.

3. Definitions/Units of Measure/Symbols

3.1 Definitions

3.1.1 Air curtain (airstream)
A directionally-controlled air curtain, moving across the entire height and width of an opening, that reduces the infiltration or transfer of air from one side of the opening to the other and/or inhibits flying insects, dust or debris from passing through. For the purposes of this publication, “air curtain” and “airstream” are synonymous.

3.1.2 Air curtain depth
The air curtain dimension perpendicular to both the direction of airflow and the air curtain width; the short dimension of the air curtain.

3.1.3 Air curtain width
The air curtain dimension perpendicular to both the direction of airflow and the air curtain depth; the long dimension of the air curtain.

3.1.4 Air curtain unit (ACU)
An air moving device that produces an air curtain.

3.1.5 Air discharge nozzle
A component or assembly, which may include adjustable vanes in the ACU, that directs and controls the air curtain.

3.1.6 Air discharge nozzle depth (N_d)
The inside dimension perpendicular to both the direction of airflow and the air curtain width.

3.1.7 Air discharge nozzle width (N_w)
The inside dimension perpendicular to both the direction of airflow and the nozzle depth.

3.1.8 Air discharge angle (θ)
The angle between the plane of the protected opening and the direction in which the air curtain leaves the discharge.

3.1.9 Psychrometrics (From ANSI/AMCA Standard 210)

3.1.9.1 Dry-bulb temperature (t_d)
The air temperature measured by a dry temperature sensor.

3.1.9.2 Wet-bulb temperature (t_w)
The temperature measured by a temperature sensor covered by a water-moistened wick and exposed to air in motion. When properly measured, it is a close approximation of the temperature of adiabatic saturation.