

## 18

# RIGHT VELOCITY AS PER AMCA/NSF GUIDELINES

**W**hat should be the Right Velocity?

Everyone in the industry struggles with the above question and many times, engineers out of their experience or some thought specify velocities at different points, either on top of the door or on the floor, etc...

Air Curtain Manual by AMCA specifies the right velocity parameters. The same is mentioned in NSF Guidelines also.

The velocity specifications as mentioned in AMCA Publication, 222-08 Application manual for Air Curtains, are as follows:

Application Manual for Air Curtains; Section 8.6.1.2

8.6.1.2 ANSI/NSF 37 - Air Curtains for Entranceways in Food and Food Service Establishments. The NSF standard establishes criteria for ACU air performance, construction, design and material type. An ACU construction that complies with this

## *The complete Guide to Air Curtains*

standard is considered by the food service industry to provide effective flying insect protection to an entryway by deterring flying insects from entering through the opening or nesting in the ACU. These criteria can be summarized into basic principles that are intended to create a clean and healthy environment.

# AMCA Publication 222-08

Application Manual for Air Curtains



**AIR MOVEMENT AND CONTROL  
ASSOCIATION INTERNATIONAL, INC.**

The International Authority on Air System Components

## The complete Guide to Air Curtains

standards specifically written to rate ACUs for sound performance, although many sound standards are applicable and can be used to rate ACUs for sound, such as ANSI/AMCA 300, ANSI/AMCA 301 and ANSI/AMCA 320, to name a few.

### 8.6.1.1 ANSI/AMCA 220 - Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating.

This AMCA standard defines the test methods that can be used to generate data for the typical types of air curtain's performance. This data can then be used to compare different models for aerodynamic performance. Note that the data generated from the tests described in the standard does not define an ACU's relative effectiveness.

If the data is measured and generated from an AMCA accredited laboratory, the product can be licensed to bear the AMCA Seal (if applied for) under AMCA 211, Certified Ratings Program - Product Rating Manual for Fan Air Performance. The AMCA Seal represents the fact that the ACU has been independently tested by a third party, adding credibility to manufacturer ratings.

The performance data generated, as defined by ANSI/AMCA 220 and simplified here, are:

- Average Outlet Velocity - the mathematical derivation of a velocity flow rate by dividing the air volume flow rate by the air curtain discharge area. This value should be used with outlet velocity uniformity to compare different ACUs.
- Velocity Projection - the average of the peak velocities measured along the ACU discharge nozzle at predetermined widths at specified distances away from the ACU. These values can also be used to determine a Velocity Uniformity at said specified distance.
- Outlet Velocity Uniformity - this is a measure of the consistency of the discharge velocities across the ACU width expressed in a percentage determined by a standard of deviation method.
- Airflow Rate - physically measured by a recognized air volume test chamber using ANSI/AMCA 210, Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating.
- Power Rating - this is the electrical power actually consumed by the entire unit (in kW) during the Air Volume Flow Rate; not to be confused with the mechanical energy equivalent to the unit horse power.

### 8.6.1.2 ANSI/NSF 37 - Air Curtains for Entrancesways in Food and Food Service Establishments.

HE NSF standard establishes criteria for ACU air performance, construction, design and material type. An ACU construction that complies with this standard is considered by the food service industry to provide effective flying insect protection to an entryway by deterring flying insects from entering through the opening or nesting in the ACU.

These criteria can be summarized into basic principles that are intended to create a clean and healthy environment. The air performance defined in this standard is geared toward protection from flying insects. The opening types are defined by three categories: Customer Entryway, Service Entryway and Drive Through Window. Each type has its own minimum performance requirement.

The Service Entryway test requires a maximum mounting height declaration and a minimum air velocity of 8.15 m/s (1600 fpm). Velocities are measured within a 75 mm (3 in.) deep by ACU nozzle width wide area broken into 75 mm x 150 mm (3 in. x 6 in.) grids, 0.9 m (3 ft) from the floor.

The Customer Entryway test requires a maximum mounting height declaration and a minimum air velocity of 3.05 m/s (600 fpm). Velocities are measured within a 200 mm (8 in.) deep by ACU nozzle width wide area broken into 50 mm x 150 mm (2 in. x 6 in.) grids, 0.9 m (3 ft) from the floor.

The Drive Thru Window test requires only a minimum air velocity of 3.05 m/s (600 fpm), 1/3 the distance of the vertical opening above the service window counter top. Velocities are measured within a 200 mm (8 in.) deep by ACU nozzle width wide area broken into 50 mm x 150 mm (2 in. x 6 in.) grids.

The design and construction requirements are intended to prevent the nesting of vermin, the accumulation of dirt, debris and moisture; and to provide accessibility for servicing, cleaning and inspection.

The material requirements are intended to ensure that the equipment is resistant to penetration from vermin and wear in the respect for food safety (*i.e.*, the effect of food, heat, refrigerants, cleaning and sanitizing compounds).

Lastly, ACU units can be tested, certified and listed to Standard ANSI/NSF 37 by nationally recognized testing laboratories and certifying bodies that have a food service program. Some of these agencies include NSF and the corresponding NSF Mark, UL.