

PRODUCT APPLICATION GUIDE

A technical bulletin for engineers, contractors and students in the air movement and control industry.

ARI Certified vs. Non-Certified Performance Ratings of Energy Recovery Wheels

Engineers rely heavily on manufacturers' performance data for product selection. The quality of the data needs to be ensured so engineers can meet their design intentions and can accurately compare products from different manufacturers. For these reasons, our industry has developed product certified ratings programs through organizations such as AMCA and ARI.

Why are certified ratings so important? Unfortunately, history has consistently demonstrated that product performance data that is not certified overstates actual performance. This article shows the magnitude to which performance may be overstated, specifically with respect to energy recovery wheels.

Greenheck's Energy Lab

To help set the stage for this discussion, it is appropriate to understand Greenheck's role in the development of ARI standard 1060 (Rating Air-to-Air Heat Exchangers for Energy Recovery

Ventilation Equipment) and the reputation of our energy lab. Like many other manufacturers, Greenheck participated in the development of the ARI standard and corresponding certification program. But unlike any other manufacturer, Greenheck's state-of-the-art energy lab was used to help calibrate the air-to-air heat exchanger lab for Intertek Testing Services (ITS), the organization which performs ARI certification tests. When ITS was evaluating laboratories to perform a series of round-robin tests to confirm the accuracy and repeatability of their lab for the purposes of ARI certification testing, they relied on just two other labs. One was at the National Renewable Energy Lab (NREL). The other was at Greenheck.

As part of our ongoing evaluation of the market, Greenheck has tested manufacturers' wheels that are listed in the ARI Certification Directory, as well as manufacturers' wheels that are not included in the directory. Energy recovery wheels from around the world were tested, including manufacturers

Non-ARI Certified Energy Recovery Wheels

	Catalogued Total Effectiveness %	Actual Total Effectiveness %	Difference (% points)
Manufacturer A	83	68	-15
Manufacturer B	77	36	-41
Manufacturer C	76	61	-15
Manufacturer D	91	79	-12

These results are from real manufacturers that are currently promoting and selling their products in the marketplace. As a courtesy, actual company names have been omitted.

from the U.S., India, Japan and Germany. We found that the wheels that are ARI Certified matched the ratings shown in the manufacturers' literature within ARI program tolerances. On the flip side, we found the performance of wheels from manufacturers who chose not to participate in the ARI Certification program to be significantly lower than catalogued.

Non-ARI Certified Test Results

The chart on page 1 shows the catalogued total energy recovery effectiveness and the actual effectiveness as measured by the Greenheck lab for four manufacturers of non-ARI Certified wheels. The differences range between **12 and 41 percentage points**, with an average difference of 21 percentage points.

At least one of these manufacturers claims "independent certification in accordance with ARI 1060". This actual performance data combined with some deceptive marketing language clearly emphasizes the importance of an ARI certification program for energy recovery wheels.

Ensure "ARI Certified" in Specifications

There is a seemingly small, but very important difference in specification wording of ARI Certified and non-ARI Certified wheels. Some examples are listed below:

Non-ARI Certified language

- Tested in accordance with ARI 1060.
- Independently tested in accordance with ASHRAE Standard 84 and ARI standard 1060.
- Independently certified in accordance to ARI 1060.

ARI Certified language

- ARI certified and listed in the ARI 1060 Directory of Certified Air-to-Air Energy Recovery Ventilation Equipment.

Keep in mind that ARI is the only HVAC industry accepted certification organization for air-to-air energy recovery ventilation equipment. Digging into other claims of independent certification typically result in not so independent testing and reporting methods.

Summary

The HVAC industry has gone to great lengths to help ensure proper product performance through the development of formal certification programs. This helps consulting engineer's design with confidence and ensures that building owners receive HVAC systems that operate as specified. Unfortunately, not all manufacturers participate in our industry's formal certification programs and, as a result, often sell equipment that does not operate up to cataloged performance. Protect yourself and your clients by including the appropriate certification language in your specifications. For air-to-air heat exchangers, accept only ARI certified products that are listed in the ARI 1060 Certified Directory of Products.