Donaldson
FILTRATION SOLUTIONS

TECHNICAL ARTICLE

New Standard for Air Filters Aims to Clear Up Confusion

As of December 2016, there's a new global standard for evaluating the performance of HVAC and industrial air filters (Class G1 to F9). It's ISO 16890 from the International Standards Organization. After an 18-month transition period concluding on June 30, 2018, ISO 16890 is set to become the uniform standard for air filters worldwide.

Jason Tiffany, a product development engineer in the Gas Turbine Systems unit of Donaldson Company, Inc., explains what the new standard means for those who specify, manufacture, and use air filters in the power industry.

Why was a new test standard needed?

JT: There have been two very different regional standards for air filter efficiency—European Normative 779-2012 in Europe and, in the U.S., ANSI/ASHRAE Standard 52.2 from the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). Asia and the Middle East have used both, as well as others. While the major standards aim to measure similar performance criteria, they do so in disparate ways that defy comparison. Conversion tables have been guesswork at best, so it's confusing for both suppliers and users of filters to communicate effectively in an increasingly global industry.

How does ISO 16890 differ from the previous standards?

JT: ISO 16890 is not just a change in measurement language, as in metric versus English. It's a change in the way the test is conducted and product ratings are determined. The methodology aims to better represent actual dirty air in the outdoor environment and report how well various filters clean it. ISO 16890 puts more focus on particulate matter (PM) classes, which aligns with the World Health Organization and Environmental Protection Agency because of hazards to human health.

What does the test method evaluate?

JT: In simplest terms, the ISO 16890 test protocol challenges filters with particulates in a broad range of diameter sizes. The test then measures average capture in three specific ranges: PM1, PM2.5 and PM10 (also referenced as ePM1, ePM2.5 or ePM10). Filters qualify for one of those three efficiency classes if they demonstrate, on average, at least 50 percent efficiency. If a filter fails to do so in any category, it is designated as Course. A filter's exact efficiency is reported next to its classification—PM1 65%, for example. It's a straightforward rating method.

Does the ISO 16890 test method account for the aging of a filter?

JT: Yes, the standard recognizes that an electrostatic charge on new filters can provide an initial performance advantage that dissipates over time. To neutralize this, ISO 16890 removes the charge in a vapor chamber. The filter is tested before and after this step, with both efficiency numbers included in test report for contrast.

How does ISO 16890 differ from existing standards in the U.S. and Europe?

JT: The new standard is intended to supersede both regional normatives by June of 2018. The test method will change the most in Europe, where EN 779 testing has used only one particle size, .4 microns, to determine ratings. In the U.S., ASHRAE 52.2 tests a variety of particulates, but its weakness has been an imprecise rating scheme: Minimum Efficiency Reporting Value (MERV) ratings, spanning from 1 to 16. A higher score is meant to correlate with better performance. However, some data have shown a negligible difference in real efficiency between filters rated MERV 8 and 11 and a big performance jump between MERV 11 and MERV 13 filters. The ISO rating method is designed to be more accurate and provide absolute values, rather than a relative scale.

How will gas turbine system operators benefit from the new filter standard?

JT: There will be three main benefits:

- **First**, filter users will be able to compare filters apples-to-apples, even those made in different countries. The standard gets everyone speaking the same language and helps companies collaborate across borders.
- **Second**, the standard mimics real-world environments better—especially outdoor air—and the ISO 16890 report is easier to interpret. Selecting a filter for a given climate, application, or cost parameters will be simpler at a glance.
- **Third**, the test will bring reported test results in the industry up to date. To earn an ISO 16890 rating, manufacturers have to get their filters retested—a significant investment. Buying an ISO-rated filter, a customer has assurance that its efficiency has been verified within the last 18 months. A MERV rating, on the other hand, could be 15 years old.

How soon will the new rating system show up on filter product data sheets?

JT: At Donaldson, we're in the process of having our filters tested by an independent lab, starting with those that are demanded in 80 percent of applications. Then, we'll move on to the rest as customers request or require. We've received our first ISO 16890 test reports and are now working to get those ratings onto our product information forms.

Will the transition be confusing to filter purchasers?

JT: The market is not likely to abandon MERV ratings or EN 779 ratings overnight after the change-over date. There will likely be a gradual conversion as equipment tests are completed. Here at Donaldson, we will classify our filters under all major rating schemes until ISO becomes predominant in the market.

I've heard of some resistance to ISO 16890, especially in the U.S. Could it be abandoned?

JT: It's not likely. The ISO standard-setting body had representation from ASHRAE, and the vote to convert to ISO 16890 was unanimous. The EN body is already committed to dropping EN 799. It's true U.S. adoption is voluntary, and there is some discussion of technical issues such as pleating, outdoor versus indoor orientation, and the discharge step. But no test method can completely replicate every atmosphere. And much of the standard's value is in providing the first apples-to-apples comparisons. Practically speaking, any company planning to do business on an international scale will need to use ISO 16890—either solely, or alongside other test methods they prefer. It will be customers who ultimately drive adoption.

For more information on ISO 16890, visit **https://www.iso.org/standard/57864.html**

# # #

Jason Tiffany is Product Development Team Lead in the Gas Turbine Systems (GTS) division of Donaldson Company. He has been a manufacturing and product development engineer for 12 years and holds a Master's degree in Engineering Management. Donaldson is a global leader in the filtration industry with approximately 160 sales, manufacturing, and distribution locations in 44 countries.

For more information on Donaldson GTS, go to **https://www.donaldson.com/en/gasturbine/index.html** or call **1-800-431-0555**.

Important Notice: Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.

Donaldson Company, Inc.
Gas Turbine Systems
P.O. Box 1299
Minneapolis, MN 55440-1299 U.S.A.

donaldson.com

North America
+1-800-431-0555
filterinfo@donaldson.com

Australasia
+61-2-4350-2000
marketing.australia@donaldson.com

India
+91-124-4807-400
IndiaInquiries@Donaldson.com

Greater China
+86-21-2313-7027
gtssales.apac@donaldson.com

Japan
+81-42-540-4113
jp-ndl.gtsweb@donaldson.com

Korea
+82-2-517-3333
gts-kr@donaldson.com

South East Asia
+65-6311-7373
sea.salesenquiry@donaldson.com

Europe, Mid-East, Africa
+32-16-38-3940
GTS-europe@donaldson.com

Latinoamérica
+52-449-300-2442
industrialair@donaldson.com

México
+1-800-343-36-39
industrialair@donaldson.com

(12/17) Technical Article: ISO Filter Standards ©2017 Donaldson Company, Inc. Donaldson and the color blue are marks of Donaldson Company, Inc. All other marks belong to their respective owners.

Donaldson FILTRATION SOLUTIONS

GAS TURBINE SYSTEMS