Jan Andersson is Deputy Managing Director and Head of Marketing for Camfil Farr in the Nordic countries. He is also Product Manager for the company's Comfort Air Filters in Europe and Chairman of Product Group 4B "Air Filters" (PG4B) within Eurovent.

New European standard for air filters FprEN 779:2011 - a step in the right direction

Jan Andersson
Deputy Managing Director and Head of Marketing
Camfil Farr
jan.andersson@camfil.se

The air filter market is expanding in Europe. It is expected to grow even more when all new buildings have to meet "zero-energy" requirements by 2020/21 (2018/2019 for public buildings). A zero-energy (ZEB) building is a popular term to describe buildings with zero net energy consumption and zero carbon emissions annually. A ZEB is basically a residential or commercial building with greatly reduced energy needs through efficiency gains. These "ZEBs" will need effective ventilation supplying high indoor air quality (IAQ), which in turn will require the use of high-quality air filters.

Evolution of filter classes

Over the years, our industry has seen the basic purpose of air filtration shift. Air filters used to be selected to protect ventilation equipment – today, their main function is to improve the indoor climate and protect the health of people. Today's polluted air in urban environments may cause headaches, cardiovascular and respiratory problems. Clean filtered air, on the other hand, leads to improved work performance, reduced absenteeism due to illness and enhanced well-being.

Over the years, filter classes have also progressed from low filter levels, such as G4 and F5, to today's high filtration classes, F7 and F9, with F7 being the most common and minimum class for guaranteeing acceptable IAQ. Unfortunately, there is a paradoxical relationship between filter classes and energy savings because the better the filter, the higher the energy consumption since a filter's resistance to air flow and pressure drop often increase. Due to their resistance to the air flow, air filters account for at least 30 percent of a ventilation system's energy consumption today.

With energy costs spiralling, the cost of cleaning, supplying and exhausting air in buildings has consequently become a major concern today and the choice of the right filters can help. Improving the energy efficiency of HVAC systems is another way to make buildings greener and combat climate change. Filters with the lowest pressure drop development, such as those manufactured and marketed by Camfil Farr, help customers reduce energy costs. Simply put, less energy is required to "push" air through the filters, which also maintain their efficiency longer, compared to low-cost products with poorly functioning filter media and/or insufficient filtration area.

In Eurovent's Product Group 4B "Air Filters" (PG4B), we have discussed pressure drop considerably and the energy classification of filters. The Eurovent Guideline 4/11 – "Energy Efficiency Classification of air filters for general ventilation purposes" – is ready and published on Eurovent's website. Starting in January 2012, Eurovent Certification will certify all fine filters that will be assigned an energy efficiency class (A to G) tested ac-

Table 1. New classification of air filters according to FprEN779:2011.

Classification of air filters [1]					
Group	**Class**	**Final pressure drop (test) Pa**	**Average arrestance (A_m) of synthetic dust %**	**Average efficiency (E_m) for 0.4 µm particles %**	**Minimum efficiency [2] for 0.4 µm particles %**
Coarse	G1	250	$50 \leq A_m < 65$	–	–
	G2	250	$65 \leq A_m < 80$	–	–
	G3	250	$80 \leq A_m < 90$	–	–
	G4	250	$90 \leq A_m$	–	–
Medium	M5	450	–	$40 \leq E_m < 60$	–
	M6	450	–	$60 \leq E_m < 80$	–
Fine	F7	450	–	$80 \leq E_m < 90$	35
	F8	450	–	$90 \leq E_m < 95$	55
	F9	450	–	$95 \leq E_m$	70

Note

1) The characteristics of atmospheric dust vary widely in comparison with those of the synthetic loading dust used in the tests. Because of this, the test results do not provide a basis for predicting either operational performance or service life. Loss of media charge or shedding of particles or fibres can also adversely affect efficiency.

2) Minimum efficiency is the lowest of any of the following three values: initial efficiency, discharged efficiency or efficiency throughout the test's loading procedure.

cording to FprEN779:2011. They will also be labelled according to their annual energy consumption, initial efficiency and minimum efficiency (ME).

Let me now comment on FprEN779:2011.

A welcomed initiative

The new European standard for air filters (FprEN779:2011) is coming into force this autumn. Its purpose is to classify air filters based on their minimum filtration efficiency (ME) on 0.4µm particles.

Camfil Farr, in its position as a leading air filter manufacturer, welcomes the new standard and considers it a step towards improving IAQ. The industry has now voted for tougher requirements for air filters. National versions will be available, after which the former standard will no longer apply.

In Camfil Farr's view, the new standard will help eradicate a number of problems related to filter performance.

One of these problems is associated with electrostatic-charged synthetic filters. These filters usually demonstrate good initial filtration efficiency while they keep their charge, but tend to discharge extremely rapidly, often after just a few weeks of operation. F7 performance in the lab for an electrostatically charged filter can therefore decrease to F5 in real operating conditions, and sometimes even more. Their cleaning ability deteriorates considerably as a result. Unfortunately, far too many European buildings are now using electrostatically charged F7 filters that have medium efficiency (ME) values between 5 and 10 percent. As a consequence, as much as 90 to 95 percent of the contaminants in outdoor air find their way into buildings and pollute the indoor environment.

By basing classification on an ME of at least 35 percent for F7, the new FprEN779:2011standard will force these filters out of the market. At the same time, it will contribute to the development of synthetic filter materials offering considerably higher particle separation.

Not all filters are the same – even in the same class

Regrettably, the price for this will include higher pressure drops and increased energy consumption. Camfil Farr has one concern about the new classification: while the "worst" filters will vanish from the market, there is a possibility that "good" filters will be made "worse". Although energy savings can be achieved by having the lowest possible pressure drop, such development could be retrograde.

For example, on 0.4µm particles, Camfil Farr's Hi-Flo XLT7 (class F7) filter has an ME value of 56 percent. However, to be classified as an F7 filter, the standard requires no more than 35 percent. Camfil Farr's position on this is clear: we will not lower the efficiency of our Hi-Flo filters. Air quality would deteriorate approximately 40 percent if we did. However, there is a risk that other manufacturers will not think like us. They may see the standard as an opportunity to reduce pressure drop and, thereby, energy consumption. This could unfortunately result in poorer air quality.

At Camfil Farr, we have always put every effort into improving IAQ. Thus, no one is more pleased than us that the new FprEN779:2011air filter standard imposes tougher requirements even if the requirements are not as tough as we would have liked and do not meet the quality standards set for our own air filters.

We welcome further debate and discussion on this.