About Energy Efficiency

The issue of energy efficiency remains permanently a topic which everyone has to face increasingly. The field of building optimization offers a wide range of options to save energy. The necessity becomes more evident and promitent with every step of the steadyly rising engergy costs.
The operational costs for filters (electric power for fans) takes mostly 60-90% of the overall costs of air filtrations. Thus the actual cost of a filter is significantly lower compared to it's operational costs.
The power consumption of a ventilation system depends among other things on the air resistance and the design of the ventilation system. Filters offer a variable resistance and thus offer a great potential for energetic and cost optimization of the filtration process.
In the filter industry is the issue of „energy-efficient filter" is not new and is a recurrent theme since the late 60s of the last century. Energy costs of filters can indeed be sufficiently calculated under laboratory conditions. Filter can be classified in energy classes (i.e. A,B,C,...) when applying a fitting model for determination.
Eurovent 4/11 is such a model but no ISO standard for energy classification. In simplistic terms this model calculates the energy consumption of a filter during a fictive lifetime and relates this with the EN779 filterclass.
The energy consumption of a filter according to this model is calculated according to the following formular. The variables like operating time and efficiency are set with generally accepted mean values as defined for the model.

The energy consumption of a filter is calculated as follows:

$$W = \frac{q_v \times \Delta p}{3600 \times 1000 \times \eta} \times t$$

W = energy requirement in kWh

q_v = 3400 m³/h

Δp = absolute value of the pressure drop during the filters lifetime. It is determined by the pressure rise over the linetime by reviewing the initial and the final pressure drop over the service life with the EN779 defined final pressure drop of 450 Pa. A more detailt description would go beyound the framework of this document.

t = 6000 operating hours (asumed filter change interval)

η = 0,5 - This corresponds to a notional 50% efficiency of the fan. The range of fans is actually in use at <25% up to 80%. The guideline is based on an average of 50%.

Our bag filter HS-AirSynErgy 88 calculates up for a absolute pressure drop of 93 Pa during it's lifetime according the Eurovent 4/11 model.
Used in the above formula, this results in an energy consumption of W = 1054 kWh. Which results in class „A2 according to the Eurovent calculation model and according to the table below. Only products which fulfill energyclass „A" in accordance to Eurovent 4/11 standard are marked in our documentation. Others won't be classified / marked.
However, an energy classification for air filter is in our opinion not in any case useful because current models lead the unexperienced user to the often false asumption to always have a benefit when using „low energy" products.
In many applications, the model data just only provides only an indication on the potential energy savings. A filter is not a complete system and the energetic efficency of the installation is depending on many more factors and influcencs than just the filter itself.
Therefore it is not a good decision to rely just on energy classifications - especially when the concerned ventilationsystem is not offering frequency controlled fans or filters have to be changed often due to hygienic regulations.

We reccomend to better get in contact with our expert advisors before you rely solely on energy classes. We can develop cost-saving solutions for you.

Energy efficiency classes according to the energy consumption @ filterclasses acc. EN 779:2012 tested @ 3400 m³/h @ 6000 h operating time

Filter class Energy class	G4	M5	M6	F7	F8	F9
A	0 – 600 kWh	0 – 650 kWh	0 – 800 kWh	0 – 1200 kWh	0 – 1600 kWh	0 – 2000 kWh
B	> 600 kWh – 700 kWh	> 650 kWh – 780 kWh	> 800 kWh – 950 kWh	> 1200 kWh – 1450 kWh	> 1600 kWh – 1950 kWh	> 2000 kWh – 2500 kWh
C	> 700 kWh – 800 kWh	> 780 kWh – 910 kWh	> 950 kWh – 1100 kWh	> 1450 kWh – 1700 kWh	> 1950 kWh – 2300 kWh	> 2500 kWh – 3000 kWh
D	> 800 kWh – 900 kWh	> 910 kWh – 1040 kWh	> 1100 kWh – 1250 kWh	> 1700 kWh – 1950 kWh	> 2300 kWh – 2650 kWh	> 3000 kWh – 3500 kWh
E	> 900 kWh – 1000 kWh	> 1040 kWh – 1170 kWh	> 1250 kWh – 1400 kWh	> 1950 kWh – 2200 kWh	> 2650 kWh – 3000 kWh	> 3500 kWh – 4000 kWh
F	> 1000 kWh – 1100 kWh	> 1170 kWh – 1300 kWh	> 1400 kWh – 1550 kWh	> 2200 kWh – 2450 kWh	> 3000 kWh – 3350 kWh	> 4000 kWh – 4500 kWh
G	> 1100 kWh	> 1300 kWh	> 1550 kWh	> 2450 kWh	> 3350 kWh	> 4500 kWh