CUSTOMER INFORMATION

viledon®

ENERGY EFFICIENCY CLASSIFICATION FOR AIR FILTERS

In Europe, between 10–20 % of electrical energy in the industrial and commercial sector is used for the operation of fans in HVAC systems. Measures aimed at saving energy include the retrofitting or use of high-efficiency, frequency-controlled fans.

A further comparatively simple and effective method of achieving significant cost reductions is the use of energy-efficient Viledon® air filters. In this case, of course, it is important to ensure that the protection goals continue to be met. Ultimately, the aim is always to find the optimum filter efficiency required for each individual application while keeping energy consumption as low as possible.

To help users choose the most energy-efficient air filters possible, the Eurovent European Association for Indoor Climate Control (HVAC), Process Cooling and Food Cold Chain Technologies has developed a European energy efficiency classification system for air filters as part of the Eurovent certification process. Freudenberg Filtration Technologies played a key role in developing this system.

Based on the Eurovent Directive 4/21 “Energy Efficiency Evaluation of Air Filters for General Ventilation Purposes”, particulate filters are tested and evaluated with regard to their energy-related operational performance. The aim is to ensure that operators of air filters can be certain that commercially available filters are correctly and uniformly evaluated and are therefore easier to compare.

Since December 2016, ISO 16890 has become the international test standard for the evaluation and classification of fine filters. It fully superseded EN 779:2012 in July 2018. As a consequence, from January 2019, the calculation and evaluation of the energy efficiency of particulate filters was also adapted to the filter classification according to ISO 16890.

Calculation of energy consumption

Calculating the energy consumption of air filters requires you to know the average pressure drop. In the context of the laboratory test procedure for air filters according to ISO 16890, the pressure difference as a function of dust loading is measured at 3,400 m³/h in addition to the filter efficiencies for the particulate fractions ePM_{10}, $ePM_{2,5}$ and ePM_1. Based on the pressure difference averaged over the dust load, it is possible to calculate a representative energy consumption with which the energy-related behavior of the filter can be simulated in the laboratory over an operating period of one year (6,000 operating hours). The method of calculation is described in the Eurovent Guideline 4/21 “Energy Efficiency Evaluation of Air Filters for General Ventilation Purposes.” The representative energy consumption value is used to classify the air filters into energy efficiency classes.

EUROVENT CERTIFIED PERFORMANCE AIR FILTERS www.eurovent-certification.com

The EUROVENT certification program, including the energy efficiency classification, can be found at:

www **www.eurovent-certification.com**

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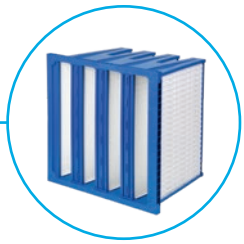
The classification system for the energy efficiency of particulate filters is defined in the evaluation standard RS4/C/001-2019. Since January 1, 2019, it has been valid for all air filter elements of the Eurovent Certified Performance Program that are classified and sold as ISO ePM1, ISO ePM2,5 and ISO ePM10 according to ISO 16890-1:2016. It refers to a front frame size of 592 x 592 mm according to EN 15805 and a nominal volume flow between 0.24 and 1.5 m³/s. The energy consumption values given in the following tables refer to a volume flow of 0.944 m³/s (= 3,400 m³/h). The new definition replaces the old energy efficiency classification, which was based on the now obsolete filter test standard EN 779. For the corresponding filter classification according to ISO 16890, the annual energy consumption is given here in kWh/year. For example, an ISO ePM1 80% fine filter with an annual energy consumption of 1,250 kWh would be in energy efficiency class A.

Mx = 200 g | ePM_1

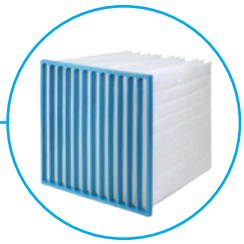
	A+	A	B	C	D	E
50 & 55 %	800	900	1,050	1,400	2,000	> 2,000
60 & 65 %	850	950	1,100	1,450	2,050	> 2,050
70 & 75 %	950	1,100	1,250	1,550	2,150	> 2,150
80 & 85 %	1,050	1,250	1,450	1,800	2,400	> 2,400
> 90 %	1,200	1,400	1,550	1,900	2,500	> 2,500



Cassette filter eMaxx 98
Energy efficiency class A
ISO ePM1 80%

Mx = 250 g | $ePM_{2,5}$

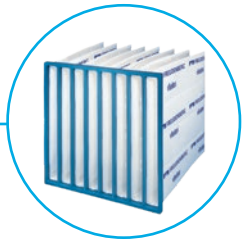
50 & 55 %	700	800	950	1,300	1,900	> 1,900
60 & 65 %	750	850	1,000	1,350	1,950	> 1,950
70 & 75 %	800	900	1,050	1,400	2,000	> 2,000
80 & 85 %	900	1,000	1,200	1,500	2,100	> 2,100
> 90 %	1,000	1,100	1,300	1,600	2,200	> 2,200



Pocket filter T 95 1/1 12 L
Energy efficiency class A+
ISO ePM1 75%

Mx = 400 g | ePM_{10}

50 & 55 %	450	550	650	750	1,100	> 1,100
60 & 65 %	500	600	700	850	1,200	> 1,200
70 & 75 %	600	700	800	900	1,300	> 1,300
80 & 85 %	700	800	900	1,000	1,400	> 1,400
> 90 %	800	900	1,050	1,400	1,500	> 1,500



Pocket filter T 60
Energy efficiency class A
ISO ePM10 60%

ENERGY-EFFICIENT USE IN HVAC SYSTEMS

During operation, the fan of an HVAC system consumes electrical energy to overcome filter resistances, among other things. In the case of regulated fans, energy consumption increases continuously as a result of the increasing pressure drop of the air filters. In this respect, many filter brands exhibit unfavorable resistance behavior. To address this issue, sustainable action means reducing the pressure drops in air filter systems to save valuable energy, avoid unnecessary costs and reduce CO_2 emissions.

For optimum operation of HVAC systems in terms of energy efficiency – while at the same time maintaining the filter efficiencies required for good indoor air quality – we recommend Viledon® air filters with the highest possible energy efficiency classes. In terms of air filters, high energy efficiency means a large dust holding capacity combined with a low pressure drop curve and thus lower energy consumption.

The Eurovent energy efficiency classes assist you in choosing the right filter. With Viledon® air filters, you can significantly improve the energy and climate protection balance of your plant. Look for the Eurovent labels on our product packaging – these will show you the energy consumption of the respective air filter.

Every plant has its own specific requirements. For this reason, the potential for savings can vary greatly and must be evaluated in each individual case. We will be happy to provide you with advice.

Viledon® air filters for energy-efficient use in ventilation systems

VILEDON PRODUCT	TYPE	ISO 16890* FILTER CLASS	ENERGY EFFICIENCY CLASS**	ANNUAL ENERGY CONSUMPTION***
T95 1/1 12 L	Pocket filter	ISO ePM1 75%	A+	948 kWh
F50 1/1 5 L	Pocket filter	ISO ePM10 50%	A+	445 kWh
T60 1/1 8 L	Pocket filter	ISO ePM10 60%	A	568 kWh
T90 1/1 12 L	Pocket filter	ISO ePM2,5 65%	A	838 kWh
T90 PRE 1/1 12 L	Pocket filter	ISO ePM10 75%	A	634 kWh
eMaxx 98 1/1	Cassette filter	ISO ePM1 80%	A	1,224 kWh
MVP 95 1/1	Cassette filter	ISO ePM1 70%	B	1,167 kWh

energy efficiency
performance

* within the framework of EUROVENT certification, measured at nominal volume flow

** within the framework of EUROVENT certification, measured at 3,400 m^3/h

*** The stated annual energy consumption is derived from a laboratory test procedure involving synthetic test dust and refers exclusively to the proportion of total energy consumption caused by the flow resistance of the filters. The annual energy consumption of an HVAC system can therefore deviate significantly under actual operating conditions.

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