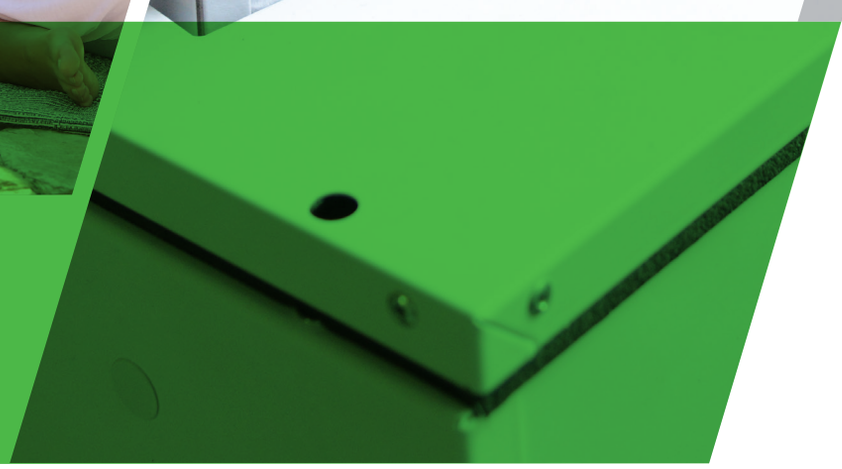
SALDA



EN ISO 16890-

A more precise filter standard helps ensure air quality

The International Standard Organisation ISO has issued a new global standard for the filtering and testing of filters ISO 16890, specifying the effectiveness of filters for testing with particles between 0.3 and 10 µm. This standard from July 2018 replaces the EN 779 standard that has been in force for more than 20 years.

In this way, currently there will be 4 new filter categories:

ISO Coarse | ISO ePM_{10} | ISO $ePM_{2.5}$ | ISO ePM_1

ISO Coarse – filters in this category contain less than 50% PM_{10} particles.
ISO ePM_{10} – contain more than 50% PM_{10} particles.
ISO $ePM_{2.5}$ – contain more than 50% $PM_{2.5}$ particles.
ISO ePM_1 – contain more than 50% PM_1 particles.

Influence of particles on health

According to the World Health Organization, air pollution causes more than 3 million premature deaths in the world every year. According to statistics, about 90% of EU citizens live in their living quarters, therefore, clean and healthy indoor air is important . The new ISO 16890 based on the impact of particles on human health through their penetration into the respiratory system sheds more light on the issue.

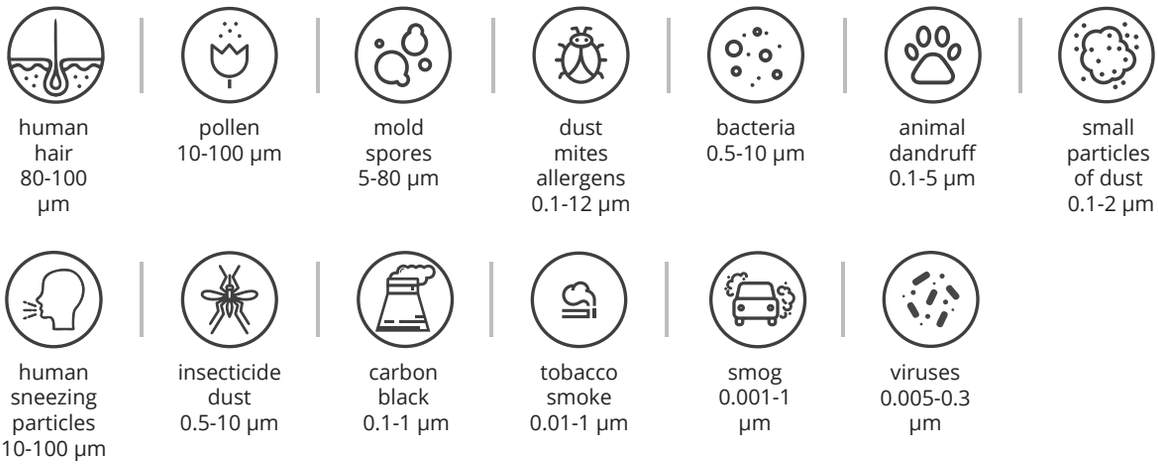
PM_{10}	$PM_{2.5}$	PM_1
10 µm and smaller particles can reach the respiratory system and lead to a weaker lung function.	2.5 µm particles fall deep into the lungs and cause not only reduced lung function, but also a number of cardiovascular diseases such as chronic bronchitis.	1 µm and smaller particles are sufficiently small to potentially enter the circulatory system and could affect the appearance of cancer, heart disease or dementia

› 5.5 - 9.2
lodges in nose and throat.
› 3.3 - 5.5
main breathing passages.

› 2.0 - 3.3
small breathing passages.
› 1.0 - 2.0
bronchi.

› 0.3 - 1.0
air sacs.

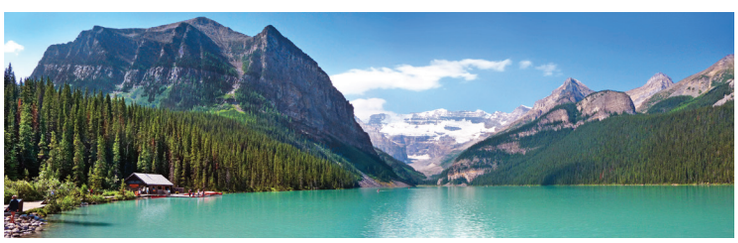
Most harmful particles in the air are less than 40 µm and invisible to the human eye.



Particles in your environment

In different territories, for example, in rural and industrial areas, air is contaminated with different particles. Eurovent proposes to distinguish three categories of territories, depending on ambient air pollution.

› ODA1. THE AMBIENT AIR IS ONLY TEMPORARILY DUSTY



Territories meet the recommendations of the World Health Organization (annual average $PM_{2.5}$ <= 10 µg/m³ and PM_{10} <= 20 µg/m³).

› ODA2. THE AMBIENT AIR CONTAINS A HIGH CONCENTRATION OF FINE PARTICLES

Territories that exceed the World Health Organization's recommendations by up to 1.5 times (annual average $PM_{2.5}$ <= 15 µg/m³ and PM_{10} <= 30 µg/m³).

› ODA3. AMBIENT AIR WITH VERY HIGH CONCENTRATIONS OF FINE PARTICLES

Territories that exceed World Health Organization's recommendations more than 1.5 times (annual average $PM_{2.5}$> 15 µg/m³ and PM_{10}> 30 µg/m³).

When selecting a filter, other types of contamination is also very important, for example, chlorides that cause corrosion of equipment in coastal areas.
Depending on the environment, it is recommended to select the appropriate filter efficiency to ensure the preferred conditions.

1- Eurovent 4/23 – 2017. Selection of EN ISO 16890 rated air filter classes for general ventilation applications.
https://eurovent.eu/

Choosing the right filter

Different room uses may require different filter efficiency. In most cases, filter efficiency relates to pressure losses through the filter and the filter lifetime, therefore, you need to choose the optimal solution to ensure the right conditions for the lowest cost of energy and investment.
The Eurovent organization has categorized the supplied air into 5 groups according to the amount of particles in the air.

SUP 1

Average particle concentration – $PM_{2.5}$ ≤ 2.5 µg/m³ ir PM_{10} ≤ 5 µg/m³.

Types of industrial premises:

- Rooms with strict hygiene requirements.
- Hospitals.
- Pharmacies.
- Electronics and optics industries, etc.

SUP 2

Average particle concentration – $PM_{2.5}$ ≤ 5 µg/m³ ir PM_{10} ≤ 10 µg/m³.

Types of residential and public spaces:

- Accommodation with permanent occupancy.
- Kindergartens.
- Hotels, offices, residential buildings, etc.

Types of industrial premises:

- Premises with average hygiene requirements.
- Food and beverage production facilities, etc.

SUP 3

Average particle concentration – $PM_{2.5}$ ≤ 7.5 µg/m³ ir PM_{10} ≤ 15 µg/m³.

Types of residential and public spaces:

- Premises with temporary occupancy.
- Supermarkets.
- Laundries.
- Server rooms.
- Warehouses, etc.

Types of industrial premises

- Premises with basic hygiene needs. For example, food production, where only basic hygiene is needed, etc.

SUP 4

Average particle concentration – PM2.5 ≤ 10 µg/m^3 ir PM10 ≤ 20 µg/m^3.

Types of residential and public spaces:
- Short-term use facilities.
- Sanitary units.
- Staircases, etc.

Types of industrial premises:
- Premises without hygiene requirements.
- General production facilities in the automotive industry, etc.

SUP 5

Average particle concentration – PM2.5 ≤ 15 µg/m^3 ir PM10 ≤ 30 µg/m^3.

Types of residential and public spaces:
- Non-residential premises.
- Data centres.
- Underground parking lots, etc.

Types of industrial premises
- Heavy industry manufacturing facilities. For example welding, steel melting facilities*.

According to the outdoor and indoor air requirements, the following recommendations for the minimum efficiency of the selection of filters are provided.

Outdoor air	SUP 1	SUP 2	SUP 3	SUP 4	SUP 5
Filter category	ePM_1	ePM_1	$ePM_{2.5}$	ePM_{10}	ePM_{10}
ODA 1	60%	50%	60%	60%	50%
ODA 2	80%	70%	70%	80%	60%
ODA 3	90%	80%	80%	90%	80%

Many of the SALDA air handling units are sold with optional filters, thus ensuring optimum customer satisfaction.

* Eurovent 4/23 – 2017. Selection of EN ISO 16890 rated air filter classes for general ventilation applications.
https://eurovent.eu/

ISO 16890 vs. EN 779

The main difference between EN 779 and ISO 16890 is that in the case of EN 779 only 0.4 µm particles are tested, thus ignoring the entire spectrum of airborne particles. In the case of ISO 16890, the particle size ranging from 10 µm to 0.3 µm has been tested, thus more precisely determining its filtration efficiency.
Filter testing and classification procedure according to ISO 16890:

Measuring the effectiveness of a clean filter with particles of 0.3-10 µ.

The filter is conditioned in an isopropanol vapour environment, thus eliminating the static charge.

Measuring the efficiency of the conditioned filter with particles of 0.3-10 µ.

The efficiency is calculated for the appropriate PM value as the average for the clean and conditioned filter efficiency.

According to the values obtained, the filter is assigned to the certain group.

The filter efficiency is rounded up in increments of 5% and is assigned to the appropriate filter class.

The exact comparison between the EN 799 and ISO 16890 filter classifications is not possible. The Eurovent organization has prepared an indicative filter class comparison. The same EN 779 class filters have different performances and can be attributed to different classes of ISO 16890.

EN 779-2012	**EN ISO 16890**		
Filter class	**ePM$_1$**	**ePM$_{2.5}$**	**ePM$_{10}$**
M5	5% - 35%	10% - 45%	40% - 70%
M6	10% - 40%	20% - 50%	60% - 80%
F7	40% - 65%	65% - 75%	80% - 90%
F8	65% - 90%	75% - 95%	90% - 100%
F9	80% - 90%	85% - 95%	90% - 100%

* Eurovent 4/23 – 2017. Selection of EN ISO 16890 rated air filter classes for general ventilation applications.
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Filters in Salda ventiliation products

Panel filters

EN 779-2012	**G4**	**M5**	**F7**	**F9**
EN ISO 16890	Coarse 65%	ePM$_{10}$ 55%	ePM$_1$ 70%	ePM$_1$ 85%

Data on pocket filters will be available from 2018-07-02.

The classification of filters used by SALDA UAB will be replaced by the VentMaster Selection Program and Filter Technical Documentation by 2018-07-02 and will specify the classes according to both standards. From 2019 onwards, only ISO 16890 filtering classification will be used in the documentation.

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