ISO 16890

WHAT IS ISO 16890?

ISO 16890 is the new international standard introduced towards the end of 2016 relating to the testing and classification of air filters. The new test results will be based on the filter's ability to remove a range of particle sizes classified as: PM1, PM2,5 and PM10. There is a fourth classification, which is known as PM coarse, which is for filters that are less than 50% efficient at the PM10 particle size.

Following the introduction of this new standard, the existing EN779:2012 standard will be phased out over a period of time and replaced by ISO 16890.

WHAT IS PM?

PM stands for atmospheric Particulate Matter. The effects of PM on human health have been extensively studied over the years. The results are that fine dust can be a serious health hazard, contributing to or even causing respiratory and cardiovascular diseases. Different classes of particulate matter can be defined according to the particle size range. The most important ones are PM1, PM2,5 and PM10.

The number signifies that the particle range is for that particular micron diameter and smaller (down to 0.3 microns). For instance, PM1 is for particles of 1 micron and less, PM2,5 is measuring at 2.5 microns and less and PM10 is for 10 microns and less.

Particle diameter size ranges for the definition of efficiencies:

Effieciency	Size Range	Type of Particulate
ePM_{10}	0,3 < x < 10	Coarse
$ePM_{2,5}$	0,3 < x <2,5	Fine
ePM_{1}	0,3 < x < 1	Fine

PM1 is the smallest and most harmful airborne particles. The NCBI concluded that PM1 may be more important for health effects than bigger size PM fractions. It was found to have greater effect on lung function parameters than the larger, PM2,5 fraction. For further information, please see the full article from NCBI https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5110587/

WHY HAS A NEW STANDARD BEEN INTRODUCED?

There has been interest from international trade and manufacturing for a well-defined, common method of testing and classifying air filters to enable maintenance personnel to choose the correct filter types they need.

Additionally, the current test standards have had known limitations by generating results which often are far away from realistic filter performance, i.e. overstating the particle removal efficiency of many products. With ISO 16890, a completely new approach for a classification system is adopted which gives better and more meaningful results.

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ISO 16890 – GROUP CLASSIFICATION

According to new ISO standard, filters are divided into four groups: PM1, PM2,5 and PM10 and PM coarse.

A requirement for each group is that the filter captures at least 50% of the appropriate particle size range. For example, if a filter captures more than 50% of PM1 particles, it will be classified as an ISO ePM1 filter. The respective efficiency is then reported, rounded in 5 % increments.

Alongside fine dust filters, the new ISO standard also evaluates coarse dust filters as ISO coarse. This refers to filters that capture less than 50% PM10.

ISO 16890	Group Classification
ISO ePM_1	ePM_1 min > 50%
ISO $ePM_{2,5}$	$ePM_{2,5}$ > 50%
ISO ePM_{10}	ePM_{10} > 50%
ISO coarse	ePM_{10} < 50%

CONCLUSION

Filtrex see the introduction of ISO 16890 as a positive move forward and will reinforce the work we currently undertake to improve indoor air quality for cleaner air and healthier lifestyles. It provides a more clear and transparent classification which will allow users and specifiers to select their filters more precisely, according to specific requirements.

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