

TFS No. 014 Issue 1

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This document is to improve the understanding of air inlet filters used in fan coils. The primary function of an inlet filter is to protect the fan and coil from the build up of dust and dirt which could potentially reduce the airflow through the unit.

0.0 References

0.1 BS EN 779:2012 Particulate air filters for general ventilation. Determination of the filtration performance

0.2 BS EN ISO 16890-1:2016 Air filters for general ventilation. Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM)

1.0 Introduction

1.1 BS EN ISO 16890 is a new standard for classifying air filters and has replaced BS EN 779:2012 which has been withdrawn.

1.2 The 'old' standard BS EN 779 uses a classification system for air filters: - G2, G3 etc, up to F9.

1.3 BS EN ISO 16890 has four parts; part 1 (BS EN ISO 16890-1:2016) covers performance testing and has a new classification for removing particulates.

2.0 BS EN ISO 16890-1: 2016

2.1 There are four ranges of particle size, based on optical or aerodynamic diameter
PM₁₀ for particles between $0.3 \leq x \leq 10 \mu\text{m}$ (e.g. pollen, desert dust)
PM_{2.5} for particles between $0.3 \leq x \leq 2.5 \mu\text{m}$ (e.g. bacteria, spores, toner dust)
PM₁ for particles between $0.3 \leq x \leq 1.0 \mu\text{m}$ (e.g. viruses, exhaust particulates, soot)

2.2 Air filters are tested and classified on how efficiently they capture PM₁₀, PM_{2.5} and PM₁ particles

ePM Coarse	captures less than 50% of PM ₁₀
ePM ₁₀	captures more than 50% of PM ₁₀
ePM _{2.5}	captures more than 50% of PM _{2.5}
ePM ₁	captures more than 50% of PM ₁

NOTE: Different sources of information may express the particle ranges and filter classes differently

e.g. PM10 can be read as PM₁₀; ePM_{2.5} can be read ePM2.5

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2.2 For each classification (except ePM Coarse), the filter captures at least 50% of the appropriate size
 e.g. if a filter captures more than 50% of PM₁ particles, it is classified as an ISO ePM₁ filter.

2.3 The classification should also include the percentage of particles captured, rounded down to the nearest 5% increment. e.g. if a filter is tested with the following results

ISO ePM10	89%
ISO ePM2.5	63%
ISO ePM1	49%

The filter is classified as ISO ePM2.5 60% (since it captures at least 50% of PM2.5 particles).

3.0 Comparison with EN779 Classification

3.1 There is no direct comparison or conversion between BS EN 779 and BS EN ISO 16890 classifications because the measurement, assessment and classification methods are different.

3.2 The table below is for guidance only and is an estimate or subjective assessment of equivalent filter classifications.

EN779	ISO16890 Classification	Alternative ISO 16890 Classification
G2	ISO Coarse	Coarse 30 %
G3		Coarse 45 %
G4		Coarse 70 %
M5	ISO ePM10	ePM10 50%
M6		ePM10 60% or ePM2.5 50%
F7	ISO ePM2.5	ePM2.5 65% or ePM1 50%
F8		ePM2.5 80% or ePM1 65%
F9	ISO ePM1	ePM1 80%

3.3 For the future, filter classifications should only be referenced to BS EN ISO 16890:2016.