**Fan Coil Inlet Filters**

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        BS EN ISO 16890 is a new standard for classifying air filters and has replaced BS EN 779:2012 which has been withdrawn.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 ≤ x ≤ 10 μm (e.g. pollen, desert dust)

                PM2.5 for particles between 0.3 ≤ x ≤ 2.5 μm (e.g. bacteria, spores, toner dust)

                PM1 for particles between 0.3 ≤ x ≤ 1.0 μm (e.g. viruses, exhaust particulates, soot)

2.2          Air filters are tested and classified on how efficiently they capture PM10, PM2.5 and PM1 particles

                ePM Coarse                       captures less than 50% of PM10

                ePM10                                 captures more then 50% of PM10

                ePM2.5                                captures more than 50% of PM2.5

                ePM1                                  captures more than 50% of PM1

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

                e.g. PM10 can be read as PM10; ePM2.5 can be read ePM2.5

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 | ISO1690 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 referenced to BS EN ISO 16890:2016