

WHO AM I ?

Paul Sketcher – Bio

HVAC industry – 45 years.

- Gardner and Naylor & East Coast Mechanical Services – 25 years.
- GHD Pty Ltd – 5 years.
- AES Environmental & Camfil Australia – 15 years.
- Current position ?

AIR CONDITIONING FILTERS

Types of Filters

- Primary Filters
Panel – Flat & V-form. Washable & Disposable.
- Secondary Filters
Deep bed.
- Secondary Compact
Mini-pleat – Either panel or cartridge.
- Molecular
Activated Carbon or Activated Alumina.
- High Efficiency
HEPA or ULPA.

AIR CONDITIONING FILTERS

Washable Versus Disposable

There are four major reasons why disposable type filters should be used in lieu of washable type filters:

- 1) Every time a filter is washed the efficiency of that filter will decrease allowing more and more dust to pass through the filter and contaminate all downstream components.
- 2) Should a washable filter be used as the only filter then the washing of this filter could cause the filter to become non-code compliant as far as the BCA and Australian Standards are concerned.
- 3) Both the EPA and Brisbane City Council have strict requirements for the washing of filters in a purpose built facility which includes grease traps and settlement tanks. The EPA has in the past taken legal action regarding the incorrect washing of filters.
- 4) The labour involved in the washing, drying, sorting and storing of a spare set of filters is more expensive than the simple replacement of a disposable filter.

AIR CONDITIONING FILTERS

Filter Efficiencies

- Primary Filters
G2 to M5 (EN 779)
- Secondary Filters
G4 to F9 (EN 779)
- Secondary Compact
M6 to F9 (EN 779)
- Molecular
Gaseous only.
- High Efficiency
99.95% to 99.999995% (EN 1822)

AIR CONDITIONING FILTERS

Filter Ratings for Air Conditioning Systems

Filter Grade	AS 1324.2 (Australian)	Ashrae 52.2 (American)	EN 779 (European)	Eurovent 4/5 (European)	Efficiency	
Primary	G2	Merv 2 - 4	G2	EU 2	≥ 65%	Average Arrestance
	G3	Merv 5 - 6	G3	EU 3	≥ 80%	No. 4 Test Dust
	G4	Merv 7 - 9	G4	EU 4	≥ 90%	
Medium	M5	Merv 10	M5	EU 5	≥ 40%	Average Efficiency
	M6	Merv 11 - 12	M6	EU 6	≥ 60%	No. 1 Test Dust
Fine	F7	Merv 13	F7	EU 7	≥ 80%	Average Efficiency
	F8	Merv 14	F8	EU 8	≥ 90%	No. 1 Test Dust
	F9	Merv 15	F9	EU 9	≥ 95%	
	No. 1 Test Dust - Particle Sizes of 0.2 µm to 2.0 µm					
	No. 4 Test Dust - Particle Sizes of 0.8 µm to 80 µm					

N.B. Every filter should have a label which nominates the filter rating.

AIR CONDITIONING FILTERS

Filter Standard Cross Reference Guide

The requirements of AS 1324.1 are equal to ASHRAE 52 and EN 779.

You would note from the references below that AS1324.1-2001 “has been generally adopted from EN 779 and that “the testing requirements are consistent with tests carried out overseas to ASHRAE 52 and EN 779.”

It should also be noted that at this point of time there is no active AS1324.1 test facility in Australia.

Extracts from AS1324.1-2001

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The classification system given in this Standard has been generally adopted from EN 779, *Particulate air filters for general ventilation—Requirements, testing, marking*.

Page 8 – Section 2.2

The performance ratings given in Table 2.1 are equivalent to the Eurovent 4/5 classifications for filters as outlined in EN 779.

Page 9 - Section 2.2

For most air-handling and air conditioning applications, testing with Test Dusts No. 1 and No. 4 shall be used to define the performance of an air filter. These testing requirements are consistent with tests carried out overseas to ASHRAE 52 and EN 779.

AIR CONDITIONING FILTERS

Filter Effectiveness

- Are your filters doing what they were designed to do?
- Are your filters doing what you want them to do?
- Are your filters doing what you were told they can do?
- Are your filters being allowed to do what they can do?

AIR CONDITIONING FILTERS

How do you measure filter effectiveness?

- How clean is your air conditioning system?
Ductwork, coils, fans, grilles.
- How clean are your rooms?
Ceilings, shelves, furniture.
- Do you have an Infection Control problem?
Swabs, patient monitoring, feed-back.

AIR CONDITIONING FILTERS

Filter Maintenance

- Monthly, Quarterly, Bi-Annual, Annual.
- In-house, Service Contractor, Supplier.
- Visual, Magnehelic, BMS.
- Readings only, recommendations, observations.
- “Have you seen your filters lately?” (Email Air Handling)

AIR CONDITIONING FILTERS

Hospital Special Applications

- 24/7
- Kitchen
- ICU & CCU
- CSSD
- Isolation Rooms (Negative & Positive)
- Day Surgery
- Operating Theatres

AIR CONDITIONING FILTERS

HEPA and ULPA Filter Testing

Factory tests.

As per EN 1822 - MPPS (Most Penetrating Particle Size)

HEPA's – Individual modules.

- H13 – 99.95%
- H14 – 99.995%

ULPA's – Ultra Clean Laminar Flow Units

- U15 – 99.9995%
- U16 – 99.99995%

On-site Testing

As per AS 1807.6 or 1807.7

- 99.99%

AIR CONDITIONING FILTERS

Cost Versus Quality

- Are you getting the right filter at the right price?
- Are your filters as specified?
- Can you upgrade without effecting comfort performance and running costs?
- Have you recently had conducted a filter Life Cycle Cost?
- Budget versus Performance.

AIR CONDITIONING FILTERS

Questions ?

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AIR CONDITIONING FILTERS

Thank You !

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