

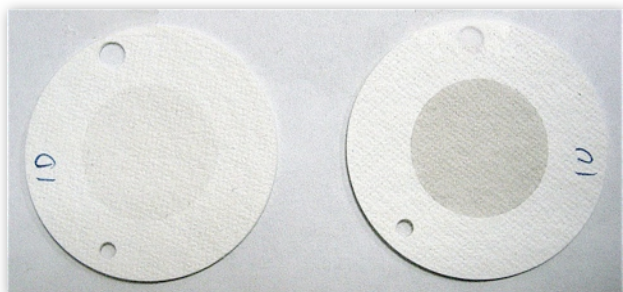


MERV!

Who is he and what does he have to do with filters?

MERV – is not a person – it stands for the **Minimum Efficiency Reporting Value**, which is the new method for reporting filter efficiencies. If you are still confused don't worry it is a little complicated. ASHRAE (American Society of Heating, Refrigeration and Air conditioning Engineers) Standard 52.2-2007 completely changed the way filter removal efficiencies are reported. The now retired ASHRAE 52.1 test standard used the familiar ASHRAE Efficiency – pleated filters were 25-30%, Bag filters ranged from 60-65% up to 90-95%. These efficiencies were widely misunderstood – most thought a 90% filter removed 90% of particles from the air – when actually it represented the difference in opacity between targets located upstream and downstream of the filter.

(see photo below for sample targets)



Downstream Target

Upstream Target

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The new standard utilizes particle size removal efficiencies to determine the MERV. Particle sizes are divided into 12 ranges (from 0.3 to 10 microns) and removal efficiencies are recorded at six points during the filter life for each range. The minimum efficiency is then determined for each range. The ranges are then combined into three groups to determine the average minimum removal efficiency. These numbers along with the chart below are used to determine the MERV. As an example a MERV 7 filter has a minimum efficiency of 50 to 70% on particles 3 to 10 microns in size.

MERV Parameters (ASHRAE 52.2 Table 12-1)				
Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency, % in Size Range, μm			Average Arrestance, %, by Standard 52.1 Method
	Range Group 1 0.30 – 1.0	Range Group 2 1.0 – 3.0	Range Group 3 3.0 – 10.0	
1	n/a	n/a	$E_3 < 20$	$A_{avg} < 65$
2	n/a	n/a	$E_3 < 20$	$65 \leq A_{avg} < 70$
3	n/a	n/a	$E_3 < 20$	$70 \leq A_{avg} < 75$
4	n/a	n/a	$E_3 < 20$	$75 \leq A_{avg}$
5	n/a	n/a	$20 \leq E_3 < 35$	n/a
6	n/a	n/a	$35 \leq E_3 < 50$	n/a
7	n/a	n/a	$50 \leq E_3 < 70$	n/a
8	n/a	n/a	$70 \leq E_3$	n/a
9	n/a	$E_2 < 50$	$85 \leq E_3$	n/a
10	n/a	$50 \leq E_2 < 65$	$85 \leq E_3$	n/a
11	n/a	$65 \leq E_2 < 80$	$85 \leq E_3$	n/a
12	n/a	$80 \leq E_2$	$90 \leq E_3$	n/a
13	$E_1 < 75$	$90 \leq E_2$	$90 \leq E_3$	n/a
14	$75 \leq E_1 < 85$	$90 \leq E_2$	$90 \leq E_3$	n/a
15	$85 \leq E_1 < 95$	$90 \leq E_2$	$90 \leq E_3$	n/a
16	$95 \leq E_1$	$95 \leq E_2$	$95 \leq E_3$	n/a



TRI-DIM FILTER CORPORATION
P.O. BOX 466 • 93 INDUSTRIAL DRIVE
LOUISA, VA 23093

(540) 967-2600 • FAX: (540) 967-2835

EMAIL: info@tridim.com • Website: www.tridim.com

TOLL FREE 1-800-458-9835



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