



270 Haven Hill Road Shelbyville, KY 40065  
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# Air Filter Test Report

Report No.  
**GLT 3731**

**26-Mar-15**

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## Particle Size Efficiency and Filter Resistance Tests

(Test procedures and apparatus described in ASHRAE Standard 52.2-2012 were used during these tests)

| Filter Description   | Test Conditions  |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
|--|--|----------------------------------|-----------------------------|----------------|-----------|-----------|-------------|---------------------|------|------|------|------|------|
| Manufacturer: Permatron<br>Product Name: Life Style Plus<br>Model/Style Code: Model MF<br>Nominal Dimensions: (inches) 24 X 24 x 1<br>Product Description:<br>combination of woven polypropylene plus non--woven polyester supported by expanded metal with a stainless steel frame<br>Number of Filter Panels: 1<br>Pleat Quantity : flat panel<br>Pocket Quantity: N/A<br>Media Type: synthetic<br>Media Color: black<br>Media Area (literature): 4 sq ft<br>Type of Dust Adhesive: None<br>Amount of Dust Adhesive: N/A<br>Filter Procurement Method: Provided by Permatron | Air Flow (CFM) 1180<br>Face Velocity (FPM) 295<br>Air Temperature Range (°F) 61 - 69<br>Relative Humidity Range (%) 35 - 41<br>Barometric Pressure Range (In. HG) 29.12 - 29.38<br>Type of Test Aerosol: Neutralized KCl<br>Particle Counters: Met One 3413<br>Filter Loading Dust: none                                       |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
| Additional Information:  | Test Results   |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
|  | Initial Resistance: 0.17 In. wg  |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
|  | Filter Resistance vs Air Flow  |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
|  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Air Flow - CFM</th> <td>295</td> <td>590</td> <td>885</td> <td>1180</td> <td>1475</td> </tr> <tr> <th>Resistance - In. WG</th> <td>0.03</td> <td>0.07</td> <td>0.11</td> <td>0.17</td> <td>0.23</td> </tr> </table>                                | Air Flow - CFM                   | 295                         | 590            | 885       | 1180      | 1475        | Resistance - In. WG | 0.03 | 0.07 | 0.11 | 0.17 | 0.23 |
|  | Air Flow - CFM   | 295                              | 590                         | 885            | 1180      | 1475      |             |                     |      |      |      |      |      |
| Resistance - In. WG  | 0.03   | 0.07                             | 0.11                        | 0.17           | 0.23      |           |             |                     |      |      |      |      |      |
| KCl Particle Size Efficiency<br>Average Efficiencies   |  |                                  |                             |                |           |           |             |                     |      |      |      |      |      |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>0.3 - 1.0 Micron Range - %</th> <th>1.0 - 3.0 Micron Range - %</th> <th>3.0 - 10.0 Micron Range - %</th> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td style="text-align: center;"><b>24</b></td> <td style="text-align: center;"><b>37</b></td> </tr> </table>   | 0.3 - 1.0 Micron Range - %   | 1.0 - 3.0 Micron Range - %       | 3.0 - 10.0 Micron Range - % | <b>2</b>       | <b>24</b> | <b>37</b> |             |                     |      |      |      |      |      |
| 0.3 - 1.0 Micron Range - %   | 1.0 - 3.0 Micron Range - %   | 3.0 - 10.0 Micron Range - %      |                             |                |           |           |             |                     |      |      |      |      |      |
| <b>2</b>   | <b>24</b>  | <b>37</b>                        |                             |                |           |           |             |                     |      |      |      |      |      |
|  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Minimum Efficiency Ranking Value</th> <th>MERV</th> <th>Air Flow - cfm</th> </tr> <tr> <td style="text-align: center;"><b>6</b></td> <td style="text-align: center;"><b>6</b></td> <td style="text-align: center;"><b>1180</b></td> </tr> </table> | Minimum Efficiency Ranking Value | MERV                        | Air Flow - cfm | <b>6</b>  | <b>6</b>  | <b>1180</b> |                     |      |      |      |      |      |
| Minimum Efficiency Ranking Value   | MERV   | Air Flow - cfm                   |                             |                |           |           |             |                     |      |      |      |      |      |
| <b>6</b>   | <b>6</b>   | <b>1180</b>                      |                             |                |           |           |             |                     |      |      |      |      |      |

See Particle Size Efficiency Curve on Page 2

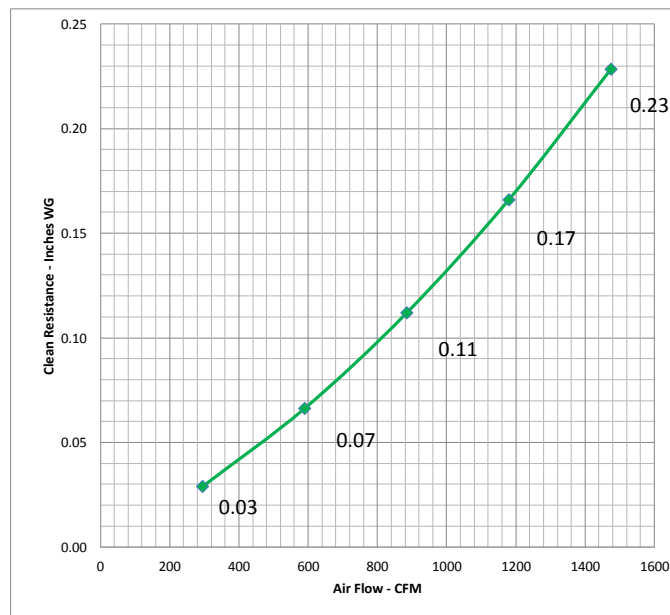
**Photograph of Air Entering Side of Filter**



**Photograph of Filter Label/Markings**



**Filter Resistance vs Air Flow**



**Comments:**

**Approval:** Monroe A. Britt  
26-Mar-15



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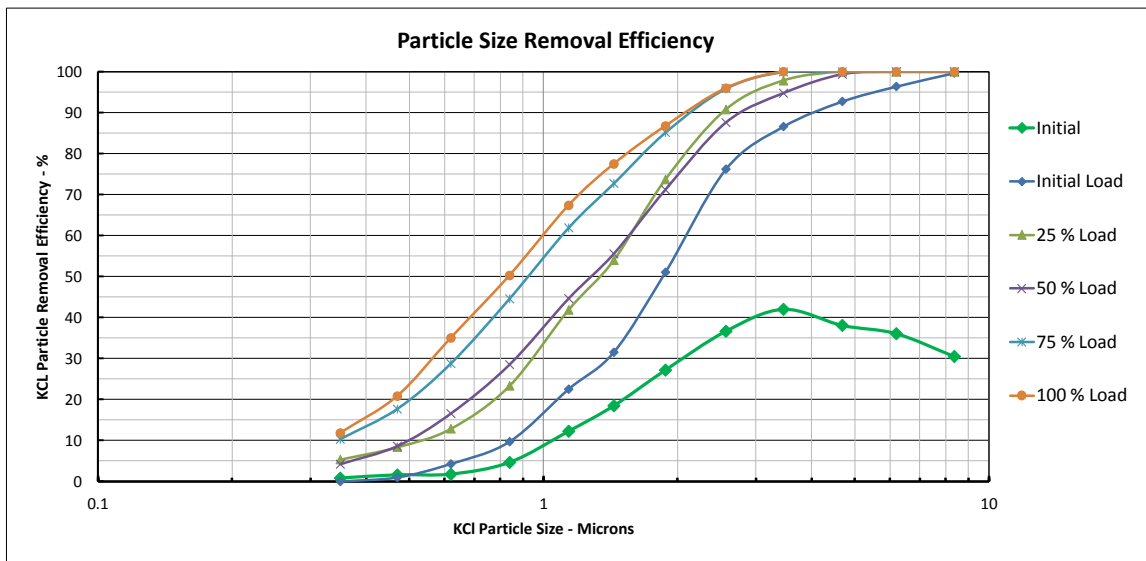
# ASHRAE Air Filter

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### Particle Size Efficiency and Filter Resistance Tests

| Filter Description           |                       | Test Conditions                    |                 |
|------------------------------|-----------------------|------------------------------------|-----------------|
| Manufacturer:                | Permatron             | Air Flow Capacity (CFM)            | 1180            |
| Product Name:                | Life Style Plus       | Face Velocity (FPM)                | 295             |
| Model/Style Code:            | Model MF              | Air Temperature Range (oF)         | 61 - 69         |
| Nominal Dimensions: (inches) | 24 X 24 x 1           | Relative Humidity Range (%)        | 35 - 41         |
| Media Type:                  | synthetic             | Barometric Pressure Range (In. HG) | 29.12 - 29.38   |
| Media Color:                 | black                 | Type of Test Aerosol:              | Neutralized KCl |
| Effective Media Area:        | 4 sq ft               | Particle Counters:                 | Met One 3413    |
| Filter Procurement Method:   | Provided by Permatron | Filter Loading Dust:               | none            |



| KCl Particle Range - Microns     | 0.30 - 0.40                    | 0.4 - 0.55 | 0.55 - 0.70 | 0.70 - 1.00 | 1.00 - 1.30                    | 1.30 - 1.60 | 1.60 - 2.20 | 2.20 - 3.00 | 3.00 - 4.00                     | 4.00 - 5.50 | 5.50 - 7.00 | 7.00 - 10.0 | Resistance after Load - In. WG | Accumulative Dust Load - Grams |           |
|----------------------------------|--------------------------------|------------|-------------|-------------|--------------------------------|-------------|-------------|-------------|---------------------------------|-------------|-------------|-------------|--------------------------------|--------------------------------|-----------|
| Mean Diameter - Microns          | 0.35                           | 0.47       | 0.62        | 0.84        | 1.14                           | 1.44        | 1.88        | 2.57        | 3.46                            | 4.69        | 6.2         | 8.37        |                                |                                |           |
| KCl Particle Size Efficiency - % |                                |            |             |             |                                |             |             |             |                                 |             |             |             |                                |                                |           |
| Initial                          | 0.82                           | 1.60       | 1.77        | 4.66        | 12.26                          | 18.48       | 27.18       | 36.67       | 42.02                           | 38.09       | 36.08       | 30.51       | 0.17                           | 0                              |           |
| Initial Load                     | 0.00                           | 0.98       | 4.29        | 9.72        | 22.54                          | 31.55       | 51.07       | 76.23       | 86.63                           | 92.76       | 96.41       | 99.71       | 0.21                           | 19                             |           |
| 25 % Load                        | 5.37                           | 8.39       | 12.88       | 23.35       | 41.89                          | 54.00       | 73.70       | 90.79       | 97.82                           | 100.00      | 100.00      | 100.00      | 0.39                           | 74                             |           |
| 50 % Load                        | 4.23                           | 8.62       | 16.56       | 28.52       | 44.63                          | 55.56       | 71.20       | 87.59       | 94.76                           | 99.36       | 100.00      | 100.00      | 0.68                           | 113                            |           |
| 75 % Load                        | 10.29                          | 17.67      | 28.77       | 44.59       | 61.91                          | 72.74       | 85.18       | 95.91       | 99.97                           | 100.00      | 100.00      | 100.00      | 0.86                           | 138                            |           |
| 100 % Load                       | 11.82                          | 20.84      | 35.03       | 50.29       | 67.39                          | 77.49       | 86.76       | 95.97       | 100.00                          | 100.00      | 100.00      | 100.00      | 1.00                           | 149                            |           |
| Minimum PSE'S                    | 0.00                           | 0.98       | 1.77        | 4.66        | 12.26                          | 18.48       | 27.18       | 36.67       | 42.02                           | 38.09       | 36.08       | 30.51       |                                |                                |           |
| E1, E2, E3                       | Avg Effic - 0.3 to 1.0 Microns |            |             | 1.85        | Avg Effic - 1.0 to 3.0 Microns |             |             | 23.65       | Avg Effic - 3.0 to 10.0 Microns |             |             | 36.67       | Dust Holding Capacity to       |                                |           |
|                                  |                                |            |             |             |                                |             |             |             |                                 |             |             |             |                                | 1.00                           | Inches WG |
|                                  |                                |            |             |             |                                |             |             |             |                                 |             |             |             |                                | 138                            | Grams     |

### Comments

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#### Filter Description

#### Test Conditions

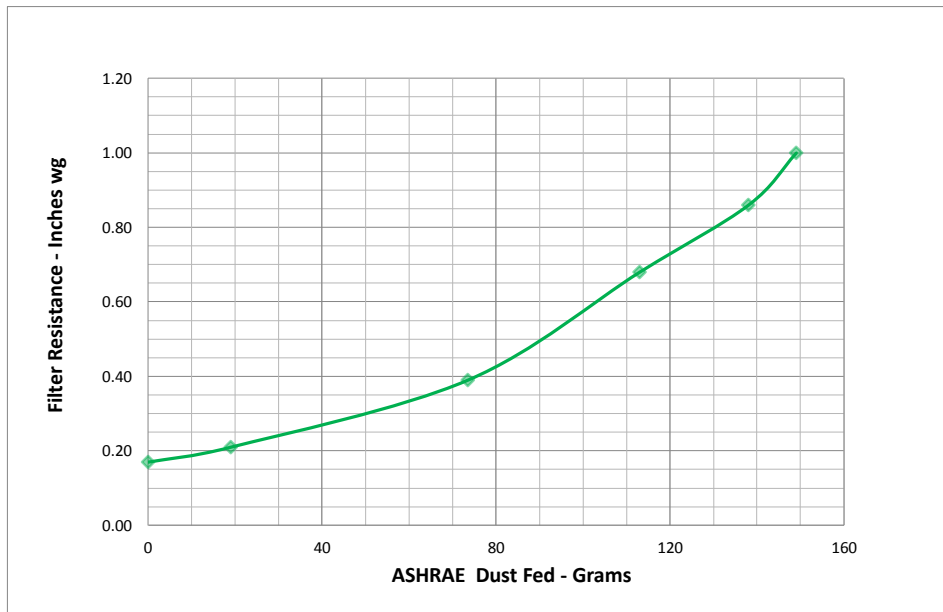
|                              |                       |                                    |                 |
|------------------------------|-----------------------|------------------------------------|-----------------|
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| Product Name:                | Life Style Plus       | Face Velocity (FPM)                | 295             |
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| Filter Procurement Method:   | Provided by Permatron | Filter Loading Dust:               | none            |

### Dust Holding Capacity and Arrestance Data

|                            |      |      |      |      |      |      |
|----------------------------|------|------|------|------|------|------|
| Dust Fed - Grams           | 0    | 19   | 74   | 113  | 138  | 149  |
| Filter Resistance - In. wg | 0.17 | 0.21 | 0.39 | 0.68 | 0.86 | 1.00 |

|                    |       |                  |            |
|--------------------|-------|------------------|------------|
| Average Arrestance | 91.6% | Final Resistance | 1.0 In. wg |
|--------------------|-------|------------------|------------|

|                       |           |
|-----------------------|-----------|
| Dust Holding Capacity | 138 grams |
|-----------------------|-----------|



Comments:

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