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"EXAMPLE ONLY"

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FILTRATION TECHNOLOGIES

GORE
Creative Technologies Worldwide

Collection Efficiency Data: Count Basis - Test Parameters

(Efficiencies based on "COUNT", not "MASS" basis)

Date: March 21, 2005
Material: GORE-TEX® High Durability Filter Bag (polyester felt, 407 g/m^2, 12 oz/yd^2)
Particulate: Monodisperse Dioctyl-Phthalate (DOP)
Face Velocity: 5.33 cm/sec.
Flow Rate: 31.99 l/min.
Counter: TSI, Inc. Model 8160 Efficiency Tester

Test A

Particle Size µm	Percent Efficiency	Upstream Counts (p/cm3)	Downstream Counts (p/cm3)
0.030	97.742	1.16E+03	2.72E+01
0.070	94.328	1.61E+05	9.12E+03
0.100	94.792	2.61E+03	1.37E+02
0.300	98.797	7.92E+03	9.90E+01

Test B

Particle Size µm	Percent Efficiency	Upstream Counts (p/cm3)	Downstream Counts (p/cm3)
0.030	97.706	1.16E+03	2.77E+01
0.070	94.240	1.60E+05	9.22E+03
0.100	94.703	2.59E+03	1.38E+02
0.300	98.820	7.40E+03	9.07E+01

Test C

R Particle Size µm	Percent Efficiency	Upstream Counts (p/cm3)	Downstream Counts (p/cm3)
0.030	98.054	1.11E+03	2.24E+01
0.070	94.967	1.70E+03	8.54E+01
0.100	95.404	2.56E+03	1.18E+02
0.300	99.034	7.81E+03	7.83E+01

NOTE: The particle count numbers listed in the table must be adjusted to account for different sampling periods (volumes) upstream and downstream, prior to calculating percent efficiency. The data presented above is for a single test. All data expressed as typical values. Please contact W. L. Gore & Associates, Inc. to confirm current information.

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Automated Filter Efficiency Testing

1. The enclosed data is based on laboratory tests, therefore, it is not practical to transpose the data into field emission data and it should be treated as relative and not empirical.

2. The data is generated for purposes of comparing the fractional collection efficiency versus particle size of various unused filter media. The filter is challenged with monodisperse dioctyl-phthalate (DOP) or charge-neutralized Sodium Chloride Aerosol particles of known size. The efficiency is determined by measuring the particle count concentrations upstream and downstream of the filter media. The particle collection efficiency is measured by an automated efficiency tester Model 8160 manufactured by TSI, Inc.

3. The test apparatus was designed to distinguish between highly efficient filter media. The most penetrating particle size is normally between 0.1 and 0.3 µm. The test, therefore, is performed in the submicron size range.

4. An air-to-cloth ratio of 10.5 fpm (5.34 cm/sec) is typically used. In some cases, the test air-to-cloth ratio may be higher than one would expect to experience in the field or at least based upon the certain types of processes. Some challenges may include efficiencies at two different air-to-cloth ratios. At least initially, the GORE-TEX® membrane filter samples show less of an effect due to the air-to-cloth ratio than the conventional media samples do.

5. Because of the apparatus, only new or virgin samples can be challenged. Therefore, this test does not take into account the establishment of either the primary or the secondary dust cakes. Although conventional woven or felted samples require the primary and secondary dust cakes, the GORE-TEX® membrane laminate filter media does not. This can be beneficial for the GORE-TEX membrane media because it does not rely upon the dust cake and can operate efficiently without pressure differential penalties.

6. The samples, which are challenged in this device, are flat and circular in shape. This is not the case for filters which, depending upon the style, are manufactured into various configurations. The test device has no potential leak points around the filter media samples unlike the cartridge or filter bag-to-collector seal. Although we do not see or expect leakage, some potential does exist for seams as well as filter-to-housing unions. This can be negligible if good manufacturing practices are performed.

7. This data is generated based on count and not mass and may be useful in "indicating" such phenomena with respect to heavy metal and/or condensable organic compound (dioxins, furans) enrichment on finer particulate.

8. This data is not an indicator for gases or vapor, which have not condensed prior to the fabric filter.

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