Coalescing Filter Design And Efficiency.

Table 1. MEDIA SPECIFICATIONS.

Grade Designation	APPLICATIONS General	APPLICATIONS Specific	D.O.P. Efficiency .3 to .6 Micron Particles	Pressure Drop PSID@ Rated Flow* Media Dry	Pressure Drop PSID@ Rated Flow* Media Wet With 10-20 wt. oil	Maximum Aerosol Particle Passed	Maximum Solid Particle Passed
2	Extremely fine particulate and "last trace" aerosol coalescing filtration; for lighter molecular weight gases and aerosols at higher pressures.	Coalescing of electronic grade gases and critical purge gases.	99.9999+%	1 - 1½	6 - 8	.4(μm)	.1(μm)
4	Very high-efficiency coalescer; for medium elevated pressures between 150 & 500 psig or lighter weight aerosols.	Protection of fluidic systems and critical modulating systems such as flow and temperature controllers.	99.995%	1 - 1½	3½ - 5	.6(μm)	.2(μm)
6 (Std.)	General air coalescing applications when "total removal of liquid aerosols and suspended fines" is required in the pressure range from 60 to 150 psig.	Protection of air gaging, air control circuits, modulating systems, critical air conveying, most breathing air systems, etc.	99.97%	1 - 1½	2 - 2½	.75(μm)	.3(μm)
8	Good air coalescing efficiency in combination with high flow rate and long element life.	Protection of non-critical circuit components such as valves, cylinders, etc.	98.5%	1 - 1½	1 - 1½	1(μm)	.4(μm)
10	Pre-coalescer or pre-filter for Grade 6 to remove gross amounts of aerosols, or tenacious aerosols which are difficult to drain.	Upgrading existing particulate equipment to coalescing without increase in pressure drop.	95%	½	½ - ¾	2(μm)	.7(μm)
3PU	Particulate interception where very high dirt-holding capacity and relatively fine pore structure are required.	Downstream of desiccant dryer as "afterfilter", general use as "instrument air" final filtration, pore-matched coalescer pre-filter.	98.5% eff. .5(μm) solids	½	N/A	N/A	3(μm)

*At rated flow, depending on filter specification.

MST, INC. PU PREFILTER

Filter Efficiency.

Filter efficiency is measured by the percentage of contaminants of a particular micron size that are captured by the filter. Filter efficiency is important because it affects not only contaminant removal performance, but also filter life. (Higher efficiency requires greater contaminant-holding capacity.)

Filter efficiency ratings for contaminant removal vary from 90% to more than 99.99%, providing a range of capabilities to fit the needs of a variety of systems. Since more efficient filter media may have shorter service lives, it is sometimes desirable to sacrifice some efficiency in the interest of economy.

In applications where high efficiency and extended filter service life are critical, a prefilter is used to remove large quantities of solid particles before they reach the coalescing filter. This can increase the coalescer's service life by up to six times. For optimum performance, select a prefilter with a 3 μm absolute rating.

Table 1 shows, by fiber grade, typical contaminant removal efficiency and operating characteristics of various coalescing filters.

Efficiency ratings are valid for flows from 20% to 120% of rated flow at 100 psig. At flows below 20%, or in non-continuous flow systems, aerosols do not agglomerate as efficiently into larger droplets, allowing more to pass through the filter uncollected. At flows above 120% of rated flow, air velocity is so high that some contaminants can be reentrained into the air system.