POINTS OF LIQUID-LIQUID COALESCING

1. The coalescing action of microfiber filters is effective with aqueous droplets suspended in oil or other hydrocarbons, and also with oil in water suspensions. Element flow pattern is inside to outside.

2. A discontinuous phase may be classified as free, dispersed or dissolved. The free discontinuous phase separates out quickly when the mixture is left undisturbed. Coalescing is the action of unifying this discontinuous phase.

3. Because of the differences in density between the liquids, some separation will naturally occur. If the specific gravity of the discontinuous phase is larger than that of the continuous phase, the droplets will settle. If the density of the discontinuous phase is less than that of the continuous phase, the droplets will rise.

4. Liquid-liquid separations are much more difficult than liquid-gas separations. Specific gravity is a key factor.

5. The settling or rise velocity of a droplet is directly proportional to the difference in densities between the liquids.

6. The smaller the droplet, the slower it settles or rises and the more difficult it is to separate from the continuous phase.

7. The greater the difference in densities between fluid, the better the separation characteristics. Generally, a difference in the specific gravities of 0.1 or greater is preferred. Also, larger droplets will settle or rise much faster than smaller droplets.

8. The efficiency of a coalescing filter is, therefore, dependent upon its ability to initiate the coalescing process, allowing the small droplets to join together to form large droplets and then effectively remove the coalesced droplets from the continuous phase.

9. The flow rate may have to be reduced to avoid carryover of the coalesced phase. Flow rate for liquid-liquid separation should be no more than one-fifth the flow rate for solid liquid separation. See chart.

   Another practical problem with liquid-liquid coalescing is that small quantities of the impurities can act as surface-active agents and interfere with the coalescing action. It is difficult to accurately predict the performance of a liquid-liquid coalescing filter because of the many variables, and each system must be tested on site.

WATER FLOW RATES IN GPH (LPM) AT 1.5 PSI DROP

Disposable (grade) Filter Element Grade C, K, S	Stainless Steel (micron) Element Grade	PTFE (micron) Element Grade	HOUSING MODEL SERIES					
			110 Series	120 Series	130 Series	140 Series	150 Series	160 Series
30	--	--	1 (.06)	2 (.12)	6 (0.4)	11 (0.7)	34 (2.0)	72 (4.0)
40	01	--	3 (0.2)	5 (0.3)	13 (0.8)	32 (2.0)	79 (5.0)	158 (9.9)
50	03	03	6 (0.4)	11 (0.7)	26 (1.6)	61 (3.8)	158 (9.9)	264 (16.6)
60	10	10	16 (1.0)	26 (1.6)	62 (3.9)	111 (7.0)	317 (20.0)	370 (23.3)
70/70C	25	25	21 (1.3)	27 (1.7)	84 (5.3)	132 (8.3)	343 (21.6)	396 (25.0)
--	50	--	22 (1.4)	29 (1.8)	90 (5.6)	140 (8.8)	360 (23.0)	410 (26.0)
80	100	--	23 (1.5)	33 (2.1)	95 (5.9)	158 (9.9)	370 (23.3)	422 (26.6)
--	200	--	29 (1.8)	41 (2.6)	118 (7.4)	185 (11.7)	462 (29.0)	527 (33.2)

Above flow rates are gallons per hour (liters per minute).

Flow rates are generally proportional to pressure drop. If initial pressure drop of 3 psi can be tolerated, then the above flow rate can be doubled. Flow rates are generally inversely proportional to liquid viscosity.

Grade 70C is the starting point for liquid/liquid coalescing.

TPL-1

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