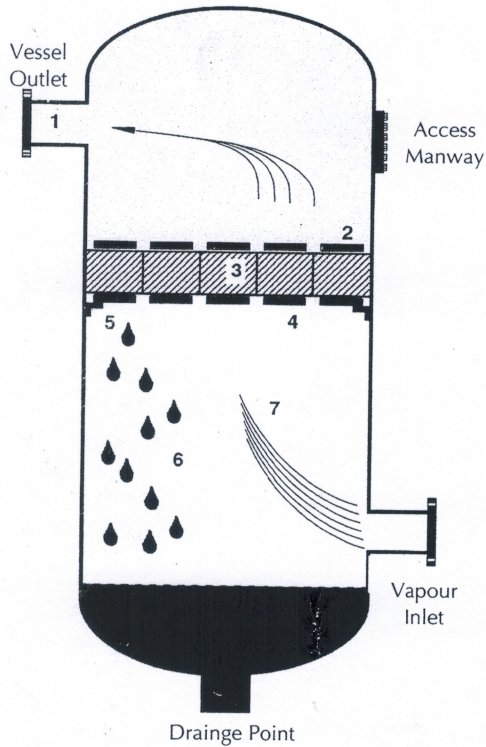


VESSEL DIAGRAM

MIST ELIMINATOR STYLES



- | | |
|------------------------------|-----------------------|
| 1. Cleaned Vapour | 4. Lower Support Grid |
| 2. Upper Support Grid | 5. Support Ring |
| 3. Wire Mesh Mist Eliminator | 6. Droplets |
| | 7. Wet Vapour |

TYPICAL DESIGN CALCULATION

Problem:

A mist eliminator is required to separate entrained liquid mist of droplets in a process stream.

OPERATING CONDITIONS

Vapour Flowrate	2.8329 m ³ /sec
Temperature	125 °C
Pressure	2.1093 kg/cm ²
Density of liquid,	939.3 kg/m ³
Density of gas/vapour,	1.8132 kg/m ³

The allowable vapour velocity through the mist eliminator is calculated by the Souders-Brown equation.

$$V_A = K \sqrt{\frac{\rho_L - \rho_G}{\rho_G}} \quad \text{Design Velocity,}$$

$$V_A = 0.11 \sqrt{\frac{939.3 - 1.8132}{1.8132}} \quad V_D = 0.75 \times 2.5012 = 1.8759 \text{ m/sec}$$

$$= 2.5012 \text{ m/sec}$$

DIAMETER OF CHANNEL REQUIRED

$$\text{DIA} = \sqrt{\frac{4 \times 2.8329}{\pi \times 1.8759}}$$

$$= 1.3866 \text{ m}$$

As the mist eliminator is mounted on to a support ring 40 mm wide, then the diameter of the mist eliminator and the I.D. of vessel is 1.466 m.

WMI TYPE	Density Kg/m ³	Surface area m ² /m ³	Free Vol. %	APPLICATION
PSA/10	192	342	97.6	High separation Most universally used.
PSA/12	173	360	97.7	High separation. Most universally used.
PSA/20	160	328	98	Flash - towers, Strippers, Knock out drums.
PSA/21	144	295	98.2	Suction drums compressors.
PSA/30	95	194	98.8	For dirty work where solids are present
PSA/31	124	395	97.3	Used in coalescers.
PSA/45	112	360	98.6	Exceptionally high separation efficiency.
PSA/50	112	230	98.6	Good separation where some solids are present.
PSA/65	240	443	97.0	High density with high separation efficiency.
PSA/75	192	656	97.6	Extremely high separation efficiency.
PSA/77	400	1284	95.1	Special applica- tions.
PSA/90	32	328	97.5	For corrosive liquids - low temperatures.
PSA/94	64	1046	92.9	For acid mists.
PSA/300	44	300	97.9	For highly corrosive conditions.
PSA/303	64	525	97	For highly corrosive conditions.