



## Chemwork

[Discussions](#)

[Members](#)

[Search](#)

[Manage](#)



[+ Follow Syed Muhammad](#)

### Vessel Internal of Three Phase Test Separator

**Syed Muhammad Ali Naqvi**

Process Design Engineer at FAUZ Engineering Limited

Dear friends,

Regarding to required removal efficiency of liquid droplets in gas outlet stream (99.5% removal efficiency from 0.5 micron to 8 micron) of 3 phase separator, demister pad at the gas outlet nozzle is not sufficient as mesh pad is applicable upto 3micron with 99.5% efficiency. Can Coalescer (Vane /Mesh) be used for this purpose? If yes, that will also reduce the vessel length because of better liquid-liquid separation. Can you guide me for vessel sizing by taking coalescer in 1st compartment of weir type 3phase Test separator? Also what minimum limit of surge

and hold up time in this case?

Like • Comment (4) • Share • Unfollow • Reply Privately • 22 days ago

[Add to Manager's Choice](#) • [Close Discussion](#)

#### Comments

4 comments



Haseeb

**Haseeb Ali**

Process Engineer at AIN Engineering Services

In order to achieve this level of gas spec (upto 0.8 micron), you will need a separate FILTER COALESCER downstream of the separator. Since filter elements are vendor products, filter vendor is the only person who can tell you about size of the vessel. However you can get an approximate size by following the same procedure as you do for phase separators but using an appropriate K value (should be pretty higher than separators K values). Refer to GPSA for separators.

Like (1) • Reply privately • Delete • 21 days ago

[👍 Syed Muhammad Ali Naqvi likes this](#)



**Saeid Rahimi Mofrad**

Senior Specialty Process Engineer at Fluor

I would first question the need for such a strict requirement (99.5% of 0.5 micron liquid droplets from the gas) for a TEST separator where I believe having such a perfect gas-liquid separation will be highly offset by the accuracy of instrument which are usually used along with the test separator for the gas/liquid flow rate measurement.

But if this is really required, cyclone type mist eliminator on the gas outlet nozzle can be used. The vane is not an option because its separation efficiency is less than the wire-mesh mist eliminator.

For liquid-liquid separation, the choice between open settler or separator with coalescing media/plate pack/cartridge elements depends on the the spec of oil in water and water in oil.

Read more on <http://www.chemwork.org/PDF/board/how%20to%20define%20liquid-%20liquid%20separation.pdf>

and

<http://www.chemwork.org/PDF/board/Three%20Phase%20Separator%20-%20Liquid%20Internals.pdf>

Delete • 21 days ago

[👍 Oluseyi Ogunrinola, Syed Muhammad Ali Naqvi like this](#)



**Syed Muhammad Ali Naqvi**

Process Design Engineer at FAUZ Engineering Limited

Dear Saied,

Syed

Muhammad It is the requirement of client in such a way that gas from outlet line of the three phase test separator will be also be used for operation of instruments on this vessel, because of the requirement of pneumatic control philosophy for instruments. There is no availability of instrument air in normal operation but only test separator outlet gas.

Thanks for literature, but here is cyclone type mist eliminator for liquid inlet nozzle. In cyclone device, there are tubes where mixed streams enters tangentially and acceleration is increased and liquid particles striking the wall, impinge and move downward in the discharge cone of tube and gas moves upward. If we install it on gas outlet nozzle then how we will maintain gas flow and install it.

Like • Reply privately • Delete • 20 days ago



**Saeid Rahimi Mofrad**

Senior Specialty Process Engineer at Fluor

I referred you to these papers for liquid-liquid separation.

For different types of gas outlet device including cyclone, see <http://www.chemwork.org/PDF/board/Three%20phase%20Separator%20-%20Gas%20Internals.pdf>

Delete • 20 days ago

Add a comment...

Send me an email for each new comment.

Add Comment