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Horizontal Vessel Slope Requirement

Saeid Rahimi Mofrad

Senior Specialty Process Engineer at Fluor
Top Contributor

Can anybody advise a value for slope of horizontal vessel.
I have seen different values from 1:100 to 1:500.

Is there any criteria for selecting slope?

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4 comments



Alireza

Alireza Rashidkhani

Senior Process Engineer at Aker Solutions

What I have seen is 1:100 but beware of corrosion at the end of the slope due to stagnant liquid exposure.

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Deepak

Deepak Goyal (AMICHEM E)

Senior Process Engineer at Technip

One of company guideline suggest to slope horizontal vessels 1 inch in 10 feet down towards the outlet or low point drain so that the vessel may be completely drained during shutdown. This slope is equivalent to a slope of 1:120.

In my view minimum slope should be around 1:200 .

1: 500 is too low for a vessel because this cant ensure gravity draining specially if liquid is viscous and having sand etc .

Thanks

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Saeid Rahimi Mofrad

Senior Specialty Process Engineer at Fluor
Top Contributor

Is there any other consideration in determining slope?

is tank slope different from horizontal vessel?

is there any length consideration? for example somebody told me that slope is not required if vessel length is lower than 4.0m. Is slope of 10m long vessel is same as 30m?

what about the effect of slope on liquid level measurement, alarm and trip of long vessel. 1:100 slope results in 200mm elevation difference between two ends of 20m long vessel.

is slope of flare KOD is same as production separator? any difference between above ground and underground horizontal vessels?

what about the effect of vessel content's properties (viscosity, sand, etc)?

what if there is a vertical column/vessel on top of horizontal vessel (like amine flash drum)? can high slope impede proper operation of column (liquid distribution, etc)?

Regards

Saeid

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Saeid Rahimi Mofrad

Senior Specialty Process Engineer at Fluor

Top Contributor

I got some feedback from my friends:

- For storage tanks designed as per API-650, the furnished tank grade shall be sloped towards sump at a slope of 1:120 unless otherwise specified by the Owner.
- For horizontal vessels with boot, slope of 1:100 to 1:200 (for vessel longer than 10m) has been proposed. Slope less than 1:200 is not normally used.
- For other cases, no slope is practically required.

Regards

Saeid

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