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### Increased Venting Requirements for Atmospheric and Low-Pressure Storage Tanks

**Mojtaba Habibi**  
Process Engineer at Wood Group

Dears,

As you know the venting requirements for Atmospheric and Low-Pressure Storage Tanks to be calculated based on latest edition of API 2000 (2009 edition) has been increased considerably in comparison with previous edition of API 2000 (1998 edition). Sometimes the new value is even 4 times the previous one!

Although API 2000 (2009 edition) presented a new method for venting calculations, still the old method which was presented at 1998 edition included as Annex-A of 2009 edition.

Usually API do not provide enough clarification for such a cases and modifications at their publications. Anyway does anybody knows the reason of this great change?

How about previous plants which are designed based on old edition? Is the rate of blanket gas (inbreathing case) obtained by 1998 edition enough to protect the storage tank against vacuum? Do they need to be modified based on increased requirements of 2009 edition?

Let me know your idea and experiences.

Thanks for your time.  
Mojtaba

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**Saeid Rahimi Mofrad**  
Senior Specialty Process Engineer at Fluor

As mentioned in API 2000 introduction, it has been developed from the accumulated knowledge and experience of qualified engineers of the oil, petroleum, chemical and general bulk liquid industry.

And I believe, despite the magnitude of changes new standard offers (especially on in-breathing rate of large tanks), it makes sense to revise a standard published in 1952.

About existing installations, it is up to operation companies to implement the new standard or not. However, the API and ISO committees highly recommend an evaluation of all installations to determine if they are at risk.

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Mojtaba

**Mojtaba Habibi**  
Process Engineer at Wood Group

Dear Saeid,

There are two interesting statements mentioned at API 2000 latest edition:

Firstly at Special Notes section:

"Users of this standard should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein."

Secondly at section 4.3.1:

"When determining the venting requirements, the largest single contingency requirement or any reasonable and probable combination of contingencies shall be considered as the design basis. At a minimum, the combination of the liquid-transfer effects and thermal effects for normal venting shall be considered when determining the total normal inbreathing or out-breathing."

The word "At a minimum" of this section may be subject of challenge. For example if the liquid stored at storage tank is stable (for example water) in comparison with other cases such as off-spec crude oil storage tank, then should we calculate the venting flowrates for both of the cases "At a minimum" and with the combination of the liquid-transfer effects and thermal effects?

Many thanks for your time.

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**Saeid Rahimi Mofrad**

Senior Specialty Process Engineer at Fluor

Dear Mojtaba,

1) I guess the "Special Notes" section can be because of two reasons:

- Variety of tanks, storage liquids, ambient condition, tank conditions, etc makes it hard to devolve a global method for calculating venting requirements of all tanks.
- AP1-2000 covers the normal and emergency vapor venting requirements for LIQUID PETROLEUM OR PETROLEUM PRODUCTS storage tanks as mentioned in scope section of this standard.

So using this standard for other applications needs sound business, scientific, engineering, and safety judgment.

2) In my opinion, "At a minimum" means that the combination of the liquid-transfer effects and thermal effects shall be considered as minimum NORMAL venting requirement for all tanks because these phenomena are applicable to all tanks.

Furthermore, as you know the required venting flow rate can be higher than NORMAL venting requirement (liquid pump in/out rate +thermal in/outbreathing). For example, emergency cases such as blanketing control valve failure, gas blow-by from process equipment to the tank, tank heating coil failure, fire, etc. may govern the size of venting device. This can be another reason for using "at a minimum" for NORMAL venting compared to EMERGENCY venting.

3) I agree with you that API-2000 new method overstates the normal venting requirement (mainly thermal effect) of a water tank as compared to the results of the same standard for off-spec crude tank. That is why for non petroleum services some companies prefer to use API-2000's old method which produces less inbreathing rate.

I appreciate if anyone can share the way they calculate the inbreathing rate of NON PETROLEUM tanks.

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