

GUIDANCE NOTE 27

Vapour return on road tankers

This note updates previous issues in 1993 and 2000

The advent of the Solvents Directive, LAPC and IPPC led to an increase in local EA inspectors demanding that road tankers have vapour return as part of a site's VOC reduction strategy. The SIA's position on vapour return for road-tankers for most VOCs remains unchanged and is summarised as follows:

1. Even when vapour return takes place, the vapours are lost to atmosphere on cleaning out the vehicle, unless the vehicle is returning to be re-filled without cleaning at the original solvent storage facility which has a vapour return system.
2. Few tankers have vapour return installed and the cost to convert existing vehicles is prohibitive, especially if they are multi-pot vehicles.
3. Customers may want to use a common system from their storage tanks in order to minimise costs. This presents the problem that the vapours returned may not be the same as those being discharged, giving rise to hazardous classification problems and potential for quality failure, even if only on odour.
4. There is no standardisation on the method or type of fittings, with some ISO tankers having only a 1-inch return line. This is in contrast to the fuels industry, which has 4-inch connections and a set standard for installations, as outlined within Directive 94/63/EC⁽¹⁾⁽²⁾ on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations.
5. There is no standard of engineering design of the pipe from the tank to the vehicle. Though this should be straightforward there is room for mistakes, and a Hazop (Hazard and Operability Study) must be carried out to ensure safe operation.
6. Some installations have blanketed head space e.g. pressurised Nitrogen, which means that these would have to be isolated, before discharge in order not to pressurise the tanker.

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7. Some deliveries are made to tanks containing mixtures that are made up of different materials being delivered by different tankers. As in 3 above the returning vapours could lead to serious safety and quality considerations.

The amount of vapour lost from storage tanks due to breathing is far in excess of the vapour lost on average due to a delivery. The amount of vapour lost will depend on the vapour pressure of the solvent, any agitation (e.g. mixing) and frequency of filling and emptying. The limit of 2 kg/hr for such discharges may well be exceeded during a delivery, which may take 30 minutes to discharge. However the Inspectors guidance does state that this situation must be kept in context e.g. delivery once a week, therefore the condition is infrequent and can be ignored.

The SIA is therefore recommending to its members that they resist installing vapour return on tankers. The following site specific options should be considered as possible alternatives to vapour return on vehicles.

- When transferring volatile liquids, the following techniques should be employed – subsurface filling via (anti-syphon) filling pipes extended to the bottom of the container.
- Vent systems should be chosen to minimise breathing emissions (for example pressure/ vacuum valves)
- Maintenance of bulk storage temperatures as low as practicable, taking into account changes due to solar heating etc.
- The following techniques should be used (together or in any combination) to reduce losses from storage tanks at atmospheric pressure:
 - Tank paint with low solar absorbency
 - Temperature control
 - Tank insulation
 - Inventory management
 - Floating roof tanks
 - Bladder roof tanks
 - Pressure/vacuum valves, where tanks are designed to withstand pressure fluctuations
 - Specific release treatment (such as adsorption/condensation)

Further information can be obtained with reference to A2 Pollution abatement technology for the reduction of solvent vapour emissions, 1994.

- (1) Directive 94/63/EC was originally implemented in England & Wales under The Environmental Protection (Prescribed Processes and Substances Etc.) (Amendment) (Petrol Vapour Recovery) Regulations, and is now implemented as part of The Environmental Permitting (England and Wales) Regulations SI 2007/3538

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- (2) The Environmental Protection (Prescribed Processes and Substances Etc.) (Amendment) (Petrol Vapour Recovery) Regulations SI 1996/2678 and the Control of Volatile Organic Compounds (Petrol Vapour Recovery) (Scotland) Regulations SI 2004/512

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