



INTERNAL FLOATING ROOFS FOR STORAGE TANKS, PONTON TYPE

Atmospheric storage tanks have contributed significantly to emissions of volatile organic hydrocarbons (VOC's). When our society developed an understanding of the economic and environmental impact as a result hereof several products were developed to reduce emissions. At the basis and forefront of these developments was the internal floating roof. By covering major part of the liquid surface and through an effective seal the emission reduction after installing an internal floating roof is in excess of 90%. The API committee has also acknowledged the importance and relevance of this development by maintaining a standard for internal floating roofs (API 650 Appendix H). Floating roofs are available in a wide range of materials including aluminium and stainless steel, executed as vapour containing as well as direct contact roofs.

Internal floating roof, typical features:

- reducing emissions of VOC's by more than 90%
- maintenance free
- compatible with all stored products, including 100% aromatics
- light weight structure manufactured from aluminium or stainless steel
- can be fitted on tanks with diameters between 6 and 120 meters
- expected service life in excess of 30 years
- designed for each specific tank
- easy installation, full installation manuals and project support available
- complies with API 650 Appendix H standard
- successfully used globally by many major oil and tank storage companies
- realistic engineering option for new storage tanks
- suitable for high filling and emptying rates as well as Nitrogen pigging and mixing operations
- can be equipped with several different seal designs in an extensive range of materials able to withstand 100% aromatics



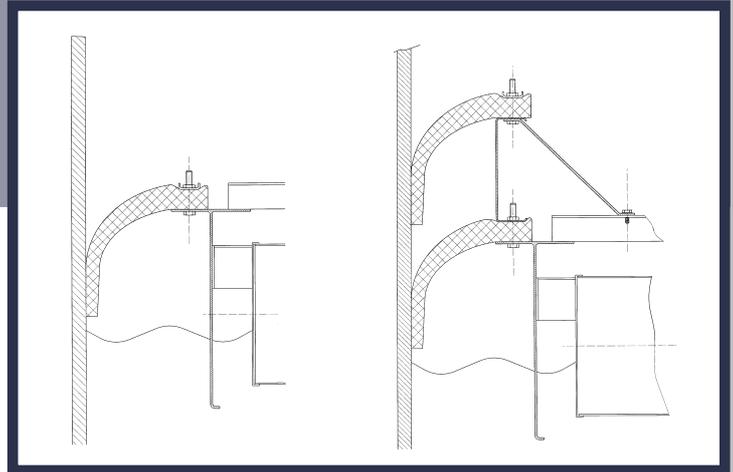
Seal arrangements:

There are several different seal arrangements available for internal floating roofs. Each seal has its own specific areas of service. Seal materials have to be reviewed and are subject to change depending on the product stored.

The most common seal arrangements are:

- single wiper seal
- double wiper seal
- mechanical shoe seal
- foam seal

Allow our team of specialists to recommend the preferred seal for your application.



Single and double wiper seal arrangement.



Cable suspended roof (no legs), top and bottom view.



Engineering aspects:

Each roof will be designed for the tank it has to be fitted in. CTS has developed forms with all relevant engineering information. This includes amongst others the tank diameter, stored product, cleaning routines, pumping rates, pigging requirements and other relevant data.

Proven efficiency:

Our roofs are extensively tested and monitored. Overall emission reductions have proven to exceed 90%. Feel free to request details of these emission measurements, so you will feel comfortable with our products and their performance.

Replacing corroded external roofs:

Besides being used in fixed roof tanks an internal floating roof is an excellent alternative for replacing heavily corroded external floating roofs. When combined with an aluminium dome roof it will eliminate rain water ingress, draining provisions, extensive repairs, blasting and painting. The combination of a dome and internal floating roof results in very low emissions. This means that the gains go well beyond reducing just maintenance costs.

Detailed product information:

Obviously this leaflet could not address all engineering details of our internal floating roofs. Full engineering information including material specifications, engineering drawings and other relevant information is available upon request. Please feel free to ask for your copy.



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