

Internal Tank Inspection

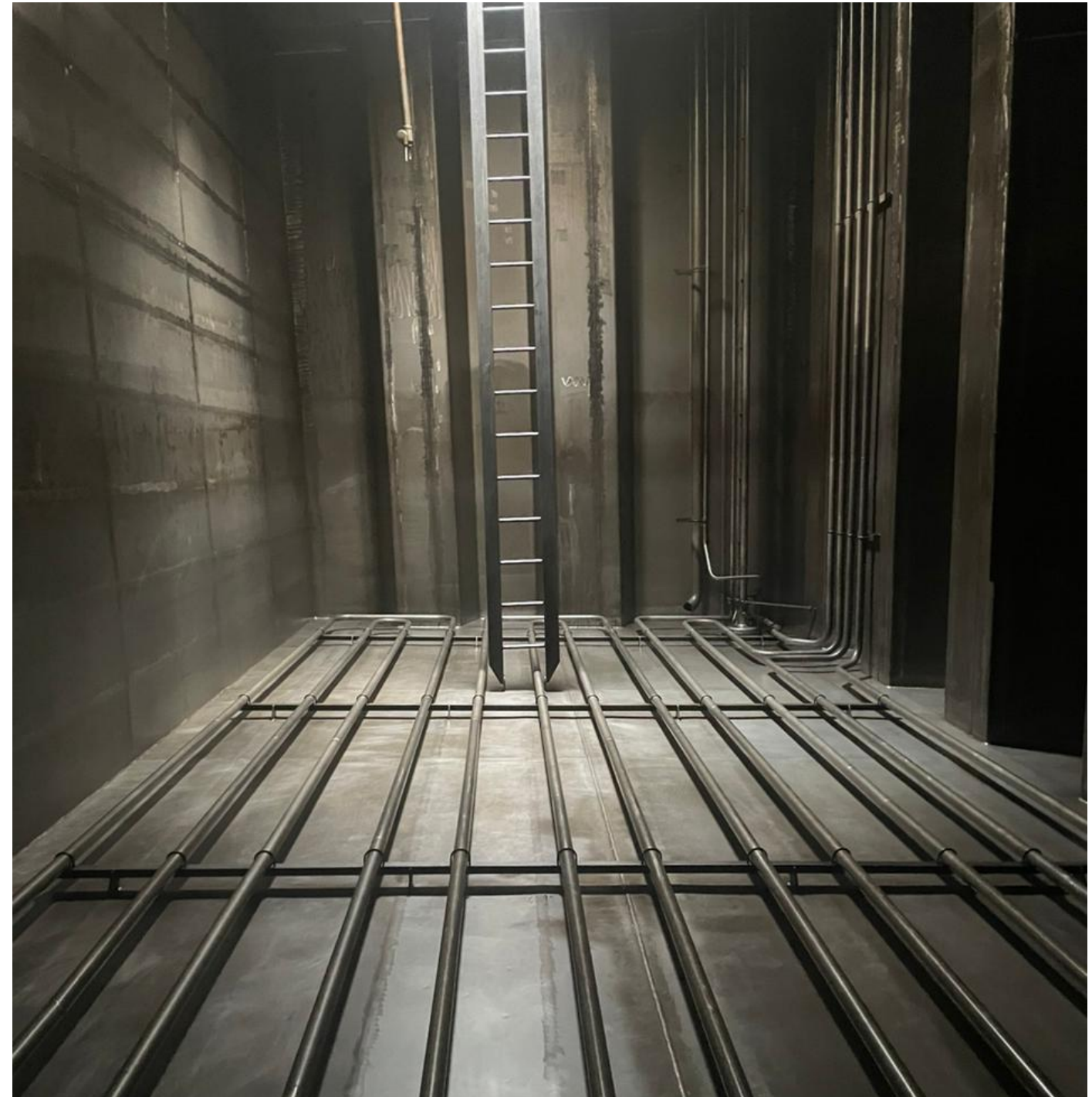


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What is a tank inspection?

Tank inspections are performed prior to receipt of a cargo, and whilst Shore tanks are typically nominated for a single grade and will load/ discharge the same product repeatedly; the tanks of road wagons and marine tankers will change grades regularly, often on each operation, therefore a tank inspection is performed to confirm the receiving tank is suitably prepared to avoid contamination by the previous cargo.

The first check for any tank inspection is to reference previous and nominated grades against a tank-cleaning guide, such as Dr Verwey's tank cleaning guide, Shell's pre-cargo matrix, Energy Institute's HM50, BP's Tank cleaning guide etc.



These guides provide guidance on common cargoes and the required tank preparations required to avoid cross-contamination between them; the inspector should check this against the vessel's records to ascertain that adequate steps have been taken.

When loading a sensitive cargo, such as chemical cargoes, or one not-compatible with the previous cargo, tank washing/ cleaning will be performed as standard practice, which usually requires some form of dryness/ cleanliness verification to confirm that all water/ chemical contaminants have been removed.

There have been recent studies undertaken within the industry using spectrophotometry to monitor wash water during tank cleaning to negate the need for wall wash analysis and avoid its incurred delays, standards agencies and chemical traders are currently reviewing these studies giving the potential for a market shift in the future to this quicker, and safer, practice.



Types of Tank Inspection

It is becoming more common in the industry for tank atmospheres to be inerted (reduced Oxygen content typically), which limits a tank inspection to manual gauging using electronic probes and detection pastes for hydrocarbons and/ or water, however this method has obvious limitations, therefore when loading a sensitive cargo, or to a designated quality specification, then it becomes crucial to perform a more thorough tank inspection, for safety of personnel this is performed from the deck visually through open hatches, sometimes incorporating atmosphere checks for specific hydrocarbons, Oxygen, Nitrogen and/ or Carbon dioxide/ monoxide.

When unavoidable for quality, or if a contractual requirement, then an inspector will physically enter a tank to perform a more in-depth pre-cargo inspection.



Hazards, Risks and Controls

The obvious hazard is traces of cargo, so only washed tanks, with ventilated atmospheres should be entered.

All Vessel tanks are Confined Spaces and as such are extremely hazardous, therefore only trained personal should perform tank entry and only after completing an entry permit, appropriate Atmosphere checks to confirm (maybe an image here of acceptable gas limits?) safe, plus a risk assessment and constant monitoring should be performed.



Inside the tank there is no fixed light source, so torches must be carried, along with personal gas monitors and gloves, overalls, and safety glasses to protect against potential chemicals, plus safety footwear to protect against slips, trips and falls. Cargo tanks are often ten metres or more in height, so access/ egress is made via ladders and gangways fixed inside the tank but falls from this height could be fatal and additional safety measures should be considered.

Whilst any person(s) are inside a confined space, mechanical ventilation should be operational, a standby person should be at the entry point with emergency rescue equipment, and effective communication methods should remain in place.



What to Check

- Primarily a visual inspection to confirm surfaces are dry and clean of residues, greases and dirt (verified by wipe tests if required), there are also requirements to confirm the condition of tank coatings, pipelines, pumps, heating coils and other fixtures and fittings.
- Odour is also assessed, and occasionally mechanical atmospheric testing is required.
- For chemical cargoes it is common for wall wash analysis to be requested, which requires rinsing of the tank surfaces with a solvent of known purity, the rinses are collected and analysis in a laboratory.
- More information and guidance is available from API MPMS Chapter 17.8 – Guidelines for Pre-loading Inspection of Marine Vessel Cargo Tanks and Their Cargo-Handling Systems.





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