We're Going Global

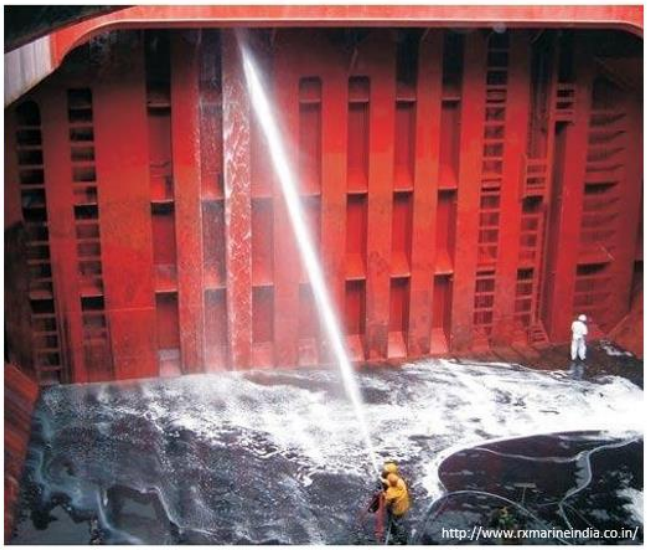
Washing Walls vs. Wall Wash

When a shore tank or vessel / barge switches from storing certain grades of product to another, washing walls and a wall wash may be required.

Washing walls, wall wash…sounds the same? Yes, they do but they couldn't be more different.

Washing Walls

Washing walls is the actual preparation and cleaning of the interior bulkheads and tank bottoms, performed by cleaning companies that specialize in the process. It is done to ready tanks for change of product service and to prepare for the Wall Wash test.



When to Wash Walls

Oil & chemical companies and vessel / barge owner and operators have their own tank cleaning guides and references. One of the most widely used industry reference guides is the Dr. Verwey Tank Cleaning Guide, which helps determine whether washing walls is required between specific grade service.

These guides are filled with matrices that compare the previous cargo and cargo to be loaded and determine whether:

- No wash is required
- Wash with COLD or HOT sea water
- Wash required with a specific solvent

Other considerations that should be taken into account include but not limited to:

- Volumes remaining on board (ROB).
- Tank wall clingage.
- The physical and chemical characteristics of the last cargo and of that to be loaded.

Confined Space Inspections

One of the most dangerous tasks inspectors encounter is tank entry and confined space inspections where safety and health procedures must be taken heavily into consideration.

Considerations include possible electrostatic and other fire and explosion hazards, protection from potential dangers to personnel, and potential explosive, fire, toxic, oxygen deficiency/enriched hazards associated with a cargo tank's environment. Also extra care should be taken when moving around inside tanks as surfaces may be slippery and lighting may be poor.

Wall Wash Test

Once the wall washing has been done, the **Wall Wash** test generally follows.

Commonly referred to as a wall wash, it is a procedure for 'washing' selected areas such as interior bulkheads, tank bottoms with an appropriate wash liquid and subsequently testing the wash for the presence of material which might contaminate the cargo to be loaded. This test is performed by an inspection company.

This TechTalk issue will focus on the Wall Wash test using a funnel photographed below. The detailed Wall Wash Test procedure can be found in API MPMS Chapter 17, Sec 8, Guidelines for Preloading Inspection of Marine Vessel Cargo Tanks.

General Wall Wash Procedures

Reagent Selection

Reagent grade chemicals should be used in all tests unless otherwise indicated. It is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society (ASC) or equivalent.

Typical reagents include

- Methanol – ACS reagent grade with very low concentrations of chlorides
- Acetone – ACS reagent grade
- High-purity Water – Unless otherwise indicated, references to water shall be understood to mean reagent water as defined by ASTM D1193

Other reagents or products may be used with agreement of all parties provided it is first ascertained that the material is of sufficiently high purity to permit its use without lessening the accuracy of the determination. Also keep in mind the reagents used for wall washing may adversely affect the atmosphere of the tank. There should be a safety review prior to handing the reagent to determine the appropriate personal protective equipment to be used.

Wash Area Determination

The following chart is to be used to determine the minimum number of areas to be selected for wall washing. Note that regardless of the number of areas indicated, each wall of the tank shall be washed.

Tank Capacity	Minimum No. Areas to Wash
<500 M^3 (3,000 bbls)	5
500-1000 M^3 (3,000-6,300 bbls)	7
>1,000 M^3 (>6,300 bbls)	9

Funnel Wall Wash Method

This wall wash method is the most common method for identifying contamination on the walls of a cargo tank.

- Pour approximately 1 L (1qt) of reagent into a HDPE squeeze bottle.
- The tank shall be dry before conducting the wall wash test.
- Choose sites on each tank wall (bulkhead).
- Start applying reagent on the sites chosen, as high as possible, while standing on the floor with the squeeze bottle approx. 6" from the wall. Approximately 100mL should be applied at each wash site.
- The funnel should be tight fitting to the wall allowing minimal reagent bypass.
- Collect the reagent with the wall wash funnel into a clean glass bottle with the funnel placed at approximately 1 m (3ft) below the stream. Do not scrape the tank wall with the funnel when collecting the reagent, to avoid possible contamination of samples with suspended matter.
- This process shall be repeated at the number of sites in the above table.

  Note: If discolored areas, lining breaks or exposed metal is noted to be less than 20% of the tank surface include these areas in the same sample as the other areas washed. If these areas are more than 20% of the tank surface, wash these areas in as separate bottle and test them separately.

- Include a sample of the reagent used in the wall wash procedure. This is the analytical "blank". In the event that the wall wash sample fails, this reagent will be analyzed and the results of the "blank" will be subtracted from each tank's wall wash sample's results.

Potential Sources of Contamination:

- Contaminates in vessel lines and cargo handling system
- Prior cargoes or prior cargo residues
- Cleaning material residues
- Pump suctions including deep well pump casings
- Vent and inert gas lines
- Residue on heating coils
- Unbroken blisters in coated tanks
- Flaking or broken blisters of the tank coating
- Discoloration of tank coating
- Sea water residues
- Condensation
- Water
- Odor
- Polymerized materials
- Rust
- Debris/particulate matter
- Additive residue

Typical Wall Wash Analysis

- Visual appearance
- Color ASTM D1209
- Hydrocarbons ASTM D1722
- Chlorides SMA 68-62