# Methanol Tank Cleaning & Washing Protocol

**IMPCA & ASTM D1152 STANDARD OPERATING PROCEDURE**

**TENDIFY TRADE UTILITIES**
Chemical Fleet Operations

| DOCUMENT ID | REVISION STANDARD | TARGET CARGO GRADE | MANDATORY STANDARD |
|---|---|---|---|
| TND-PROT-METH-001 | v2026.1 (IMPCA) | AA-Grade (≥99.85%) | ASTM D1152 / D1363 |

## 1. STANDARDIZED 5-STAGE TANK CLEANING PROCEDURE

Sequential Execution

### Stage 1: Pre-Wash Stripping, Vapor Purge & Inerting

$N_2$ Blanket Padding

Drain all residual previous cargo heel using vessel's stripping pump. Inert cargo tanks with high-purity dry Nitrogen gas ($N_2$ purity ≥ 99.9%) to lower oxygen levels below **8% vol** before opening tank washing machines, mitigating flammable vapor hazards (Flash Point ~11°C).

### Stage 2: Seawater Hot/Cold Wash Cycle

Temp: 60°C–70°C | Pres: 8–10 bar

Perform automated Butterworth machine wash with seawater. Duration depends on previous cargo (minimum 2 hours for light hydrocarbons, 4+ hours for heavy lube oils/paraffins). Continuous stripping must be maintained to prevent slop buildup on cargo floor.

### Stage 3: Fresh Water & Deionized (DI) Water Final Rinse

Conductivity < 5 µS/cm

Flush tank walls with warm fresh water to strip sea salts (chlorides). Complete with a dedicated Deionized (DI) water rinse.
**Critical Rule:** Ensure chloride level in drain water drops to < 0.5 ppm before proceeding to solvent wash.

### Stage 4: Methanol Solvent Washing (Mop/Recirculation)

Technical Pure Methanol Wash

Recirculate or spray technical-grade methanol over all internal tank bulkheads, heating coils, and pump sumps to absorb residual water film and remove non-water-soluble hydrocarbon micro-traces.

### Stage 5: Forced Dry Air, Wall Dryness & $N_2$ Inerting

Dew Point < -40°C

Purge tank with dry air until completely moisture-free. Verify zero liquid residue at sump. Seal tank hatches and apply dry Nitrogen padding to maintain positive pressure (>0.2 bar) prior to surveyor inspection.

## 2. IMPCA WALL WASH TEST LABORATORY THRESHOLDS

Quality Acceptance

| TEST PARAMETER | ASTM / TEST METHOD | IMPCA PASS LIMIT | FAILURE ACTION |
|---|---|---|---|
| **Permanganate Time Test** | ASTM D1363 | **Min 50 Minutes** | Re-rinse & solvent wash (organics present) |
| **Water Miscibility (Hydrocarbons)** | ASTM D1722 | **Pass / Clear (No Turbidity)** | Repeat hot fresh water wash + solvent wash |
| **Color Scale** | ASTM D1209 | **Max 5 Pt-Co units** | Inspect tank coating / re-clean sumps |
| **Chloride Content** | IMPCA 002-98 / Titration | **Max 0.5 ppm (µg/g)** | Re-wash with DI water (salt residue) |
| **Specific Gravity (20/20°C)** | ASTM D4052 | **0.7910 – 0.7930** | Check for heavy liquid contamination |

**Surveyor Verification Note:** Wall wash samples must be taken from four distinct bulkhead zones (aft, forward, port, starboard) and the tank sump using laboratory-grade pure methanol. If any single zone fails the Permanganate or Chloride

## 3. VESSEL TANK INSPECTION & SURVEYOR SIGN-OFF SHEET

Official Record

This checklist must be jointly executed by the Chief Officer and the Independent Surveyor (e.g., SGS, Saybolt, Intertek) prior to opening terminal loading valves.

| | | | |
|---|---|---|---|
| **Vessel Name:** | [Insert Vessel Name] | **IMO Number:** | [Insert IMO Number] |
| **Port of Loading:** | [Insert Loading Port/Terminal] | **Inspection Date:** | [YYYY-MM-DD] |

| Tank No | Previous Cargo | Cleaning Method | Wall Wash Result | Seal Number | Status |
|---|---|---|---|---|---|
| **1P** | Gasoline / Pygas | Hot Wash + DI + Solv | PNT: >50m \| Cl: <0.5 | SGS-772091 | **PASSED** |
| **1S** | Gasoline / Pygas | Hot Wash + DI + Solv | PNT: >50m \| Cl: <0.5 | SGS-772092 | **PASSED** |
| **2P** | Caustic Soda (Lye) | Acid Rinse + DI Wash | PNT: >50m \| Cl: <0.5 | SGS-772093 | **PASSED** |
| **2S** | Caustic Soda (Lye) | Acid Rinse + DI Wash | PNT: >50m \| Cl: <0.5 | SGS-772094 | **PASSED** |
| **3P** | Ethanol (Industrial) | DI Rinse + Dry Air | PNT: >50m \| Cl: <0.5 | SGS-772095 | **PASSED** |
| **3S** | Ethanol (Industrial) | DI Rinse + Dry Air | PNT: >50m \| Cl: <0.5 | SGS-772096 | **PASSED** |
| **4P** | [Enter Prev Cargo] | [Method Used] | [Lab Result] | [Seal No] | **PASSED / FAIL** |
| **4S** | [Enter Prev Cargo] | [Method Used] | [Lab Result] | [Seal No] | **PASSED / FAIL** |

## 4. OPERATIONAL SAFETY & NITROGEN PADDING VERIFICATION

Safety Checks

- ☑ **Wall Dryness Verified:** Karl Fischer titration confirms zero moisture condensate on bulkheads.
- ☑ **Oxygen Level:** Confirmed < 8% vol across all cargo holds via certified O₂ meter.
- ☑ **N₂ Blanket Pressure:** Positive pressure (>0.2 bar) established prior to manifold hookup.
- ☑ **First-Foot Sampling Plan:** First-foot sample protocol agreed with terminal & loading arms isolated.

**VESSEL CHIEF OFFICER**

I hereby certify that tanks have been cleaned, dried, and inerted per IMPCA standards.

Signature & Vessel Stamp Date: _____

**INDEPENDENT SURVEYOR (SGS / SAYBOLT)**

I verify that wall wash testing yields pass results for AA-grade Methanol loading.

Signature & Company Seal Date: _____