



highguard protected tank - installation instructions

site preparation, handling, placement, & air testing

HT-7001

Read and understand this entire document before beginning testing process

1.0 Excavation & Bedding

1.1 The bottom of the excavation shall be covered with a minimum of 12 inches (305mm) of approved bedding material, suitably graded and leveled. Bedding and backfill material surrounding the tank, to a width and depth of 12 Inches (305 mm) all around the tank, shall be clean material.

1.2 Where anchoring by means of a concrete pad, the tank shall not be placed directly on the pad. Bedding material at least 6 Inches (152.4 mm) deep must be spread evenly over the dimensions of the pad to separate the tank from the pad.

1.3 Bedding and backfill material shall consist of homogeneous pea gravel, crushed stone, clean sand or natural earthen materials.

Crushed stone, clean sand and natural earthen materials shall be capable of passing 100% through a 1/2 inch (13 mm) sieve and no more than 12% by dry weight through a #200 sieve (0.0029 Inch (0.0754 mm)). Pea gravel shall be no larger than 3/4-inch (19 mm). The materials shall be free of all foreign materials; such as but not limited to, bricks, metals, concrete and plastics.

1.4 The backfill material may be from the tank site if it meets the description, or it may be delivered to the site from another source.

1.5 Sand or natural earthen materials used as backfill shall be placed into the excavation in 12-18 inch (305-458 mm) vertical lifts, compacted after each lift, at least 60% up the vertical height of the tank.

1.6 If earthen material from the site, or other earthen material, is to be used as bedding or backfill material, a minimum of four 1 cu.ft. samples shall be taken from different locations which are representative of the backfill material and the site. Samples shall be sieved to determine if the material compiles with this specification.

1.7 In a tidal area, the tank "bedding" material shall be crushed stone or pea gravel. Sand and natural earthen material may be used only if measures are taken to prevent washout of material during the design life of the system.

2.0 Air Test at Job Site

2.1 The temporary plugs and thread protectors installed by the manufacturer shall be removed. Apply compatible, non-hardening pipe sealant to internal bushing threads. Permanent metal plugs shall be installed at all unused openings.

2.2 Plugs used to temporarily seal the tank for the aboveground air test, but later removed for pipe installation, shall not be over-tightened. Do not cross thread or damage the threads when replacing plugs or installing required tank piping.

2.3 Test pressure shall be maintained at, but not exceed, 5 PSIG (34.5 kPa) while a soap solution is applied to the area of pipe connections and welds.

2.4 Double-wall tanks will require different air pressure testing procedures. Do not connect a high pressure air line directly to the interstitial monitoring port. A factory applied vacuum within the Interstitial space can be used in lieu of, or In addition to, the air test procedure. Do not apply a vacuum to the primary tank or a single wall tank. PEI/RP100-2000 also provides guidelines.

2.5 Take necessary safety precautions during air tests. Do not leave tanks unattended while under pressure. Avoid standing at the head of the tank, especially while applying air pressure. Use an air-pressure relief valve.

3.0 Tank Inspection

3.1 Before placing the tank in the excavation, all dirt clods and similar foreign matter shall be cleaned from the surface of the tank.

3.2 Visually inspect the tank for damage. Pay particular attention to areas where cladding has been gouged or abraded. Mark all areas, which appear damaged for repair. Any section of the cladding, which has been damaged beyond the surface of the cladding, shall either be repaired or spark tested. Spark testing shall be done with a holiday detector set at 10,000 volts.

3.3 Coat all holidays, damaged cladding, and/or exposed steel surfaces using touch-up kit furnished by tank supplier. Follow manufacturer's instructions for mixing and application of resin. (See Section 8 for touch-up procedures.) All holidays shall be re-tested at 10,000 volts.

4.0 Tank Handling

4.1 Equipment to lift the tank shall be of adequate size to lift and lower the tank without dragging or dropping to prevent damage to the tank or the coating.

4.2 Tank shall be carefully lifted and lowered by the use of cables or chains of adequate length attached to the lifting lugs provided. A spreader bar should be used where necessary. Under no circumstances shall chains or wire rope slings be used around the tank shell.

5.0 Anchoring

5.1 High water tables or partially flooded excavation sites exert significant buoyant forces on tanks. Buoyant forces are partially resisted by the weight of the tank, the backfill and the pavement a top the tank. Additional buoyant restraint when required, shall be obtained by using properly designed hold-down straps in conjunction with concrete hold-down pads or deadman anchors. The use of steel cable or round bar as hold-down straps is prohibited.

5.2 If a metallic hold-down strap is used, a pad of inert insulating di-electric material must be used to insulate the hold-down strap from the tank. The separating pad shall be wider than the hold-down straps, which will prevent direct contact between the straps and the tank shell. This pad is not required if the hold-down strap is fabricated from non-conductive material.

5.3 Ballasting the tank may be necessary. When water is used as the ballast material, it shall only be potable water and shall not remain in the tank longer than 60 days. During construction, adequately vent all tank spaces. If product is used as ballast, proper precautions must be taken to prevent fires, spills, leaks, and other associated accidents. Monitor product level frequently to ensure there has been no unaccounted loss of product.

6.0 Backfill

6.1 Homogeneous backfill material similar to the bedding material shall be carefully placed around the entire tank to create a uniform homogeneous environment. Avoid damage to cladding especially where tamping is required.

6.2 Installing and tamping backfill along the bottom sides of the tank shall ensure that the tank is fully and evenly supported around the bottom quadrant.

7.0 Final Air Test

7.1 Install required tank piping using compatible non-hardening sealant, taking care not to cross thread or damage the threads. Torque of 400 to 1,000 ft lbf (542.3 to 1355.8 N-m) may be required to fully insert pipe.

7.2 Where air or hydrostatic testing is required after installation, the pressure applied shall not be in excess of 5 PSIG (34.5 kPa) as measured at the top of the tank. A soap solution shall be applied around pipe connections while air test is being performed.

8.0 Sealing of Pipe Connections, Lifting Lugs and Repairs

8.1 Highland Tank per HighGuard specifications, has applied the cladding over all steel surfaces. During the installation process, steel can become exposed at the lift lug due to handling of the tank. These areas, along with all other exposed steel surfaces, must be covered via the touch-up kit supplied by Highland Tank.

After application, the installer shall verify that the repaired area has cured (adequate material hardness and solidification) prior to back fill. Normal cure time may vary.

8.2 Clean areas to be repaired through removal of surface rust, dirt, contaminants, and disbonded cladding. The cladding surrounding all holidays, cladding flaw areas, and/or exposed steel areas should be surface prepared by using a coarse grit sandpaper or grinder. (Refer to SSPC SP-2 Hand Tool Cleaning* or SP-3 'Power Tool Cleaning' for additional guidance). This process should remove all glossiness from the surface surrounding the repair area within 6 inches (152 mm) of the holiday.

8.3 After an air test has established tightness, tank fittings shall receive a coat of urethane or be covered with a coat of the repair material prior to backfill. (Refer to section 8.2 for surface preparation). Area to be coated shall include the entire plug on unused fittings.

9.0 Final Backfill

9.1 Homogeneous backfill shall be deposited carefully around the tank and to a depth of at least two feet over the tank. (See NFPA 30 and state or local codes for minimum depth of cover required).

9.2 If cladding damage occurs after holiday testing or during backfill operation, repairs shall be made in accordance with Section 9.

10.0 Operating Limitations

10.1 Tanks shall only be operated at ambient temperature.

11.0 Maintenance

11.1 The primary tank shall be inspected monthly for the presence of water. Inspection shall take place at the lowest possible points inside the primary tank. Remove any water found. Water and sediment in fuel can cause plugging of filters. Also, bacterial growth, originating from the fuel, can cause filters to plug and corrosion of tanks and lines. A report by the US Department of Energy, Brookhaven National Laboratory BNL 48406, which provides information on methods to test for and remove water, test for bacterial presence in fuel, tank cleaning and fuel additives. Failure to remove water from the tank may void your warranty.

11.2 Tank must be installed within one year of delivery from Highland Tank. If tank is not installed within this time period, contact Highland Tank to recertify the tank.

These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in underground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning tank installation. Highland Tank makes no warranties, express or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose, as a result of these installation instructions.



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