

FLAMESHIELD® LIMITED WARRANTY  
Limitations of Liability and Disclaimer

**What is Covered by this Warranty**

Provided that the conditions set forth below are satisfied, the steel tank manufacturer identified with the tank (hereinafter referred to as "Warrantor") warrants the FLAMESHIELD® product for 30 years following delivery of the product to the tank owner at the time of the original installation ("the Owner"), against any of the following events which may occur, provided the event occurs under operating conditions covered by this Warranty: (i) against release of stored product from the FLAMESHIELD® secondary containment system; (ii) against failure of the primary tank caused by non-corrosion related cracking, breakup or collapse; and (iii) perforation of the primary tank caused by internal corrosion as long as the product stored within the tank is compatible with steel. In addition, the Warrantor warrants the tank against failure due to defective materials and workmanship for up to one (1) year following the delivery of the tank to the Owner.

**Conditions to Warranty Effectiveness**

The limited warranties set forth herein are subject to the following conditions:

1. The FLAMESHIELD® product must be: (i) the Original Aboveground Installation within the Continental United States of America, Alaska, Hawaii, and the Commonwealth of Puerto Rico or Canada; (ii) was fabricated by the Warrantor so as to meet the F921® and/or F911® Specification(s); and (iii) was installed and maintained in accordance with the applicable FLAMESHIELD® Specification and the applicable FLAMESHIELD® Installation Instructions that were in effect on the date of shipment by the Warrantor, any subsequent maintenance procedures of which the Owner has written notice, and any applicable governmental codes and regulations. Refer to the Installation Instructions on the back of this document for technical requirements concerning relocation of this tank by the original owner, in order to retain warranty eligibility. Tanks remaining in their original installation location will retain warranty eligibility if the facility where the tank is installed is sold to a new owner.

2. This Limited Warranty is not valid unless, and until, the Warranty Validation Card is fully completed by the Owner and returned to Steel Tank Institute (STI) within 30 days after the date of tank installation, or 90 days after the Warrantor's shipment of the tank, whichever comes first.

3. Upon discovery of a suspected covered failure or leak by the Owner, the Owner shall give the Warrantor written notice of the suspected failure or leak and permit the Warrantor or its designated representative to inspect the tank site prior to, during and after removal of the tank. The tank owner bears the responsibility to identify that the cause of the failure is from one of the events within the Conditions covered by the Warranty.

4. Upon the Warrantor's determination that the failure or leak is covered by this Limited Warranty, the Warrantor at its sole option shall: (1) repair the FLAMESHIELD® product; or (2) replace it with a tank or dike of approximately the same size, design, quality of material and workmanship specified for the original FLAMESHIELD® product; or (3) refund the purchase price of the original FLAMESHIELD® product. If the Warrantor is unable to repair or replace the tank, it shall refund the original purchase price of the FLAMESHIELD® product.

**What is Not Covered by this Warranty**

Warrantor does not warrant any piping system or any other attachments connected with the tank. Under no circumstances, shall the Warrantor be liable for (1) the cost of repair or replacement of any piping system or other attachments to the tank; or (2) labor costs or other installation costs for replacement of tank or dike; or (3) damage to the FLAMESHIELD® product or other property resulting from the accumulation of water in the tank or dike; or (4) damage caused by other improper operating or maintenance practices; or (5) tank failure due to defective materials and workmanship later than one year following delivery of the tank to the Owner or (6) cost of repair or replacement of internal linings or external coatings. This Warranty does not cover STI Generator Base Tanks.

**Limitation of Liability and Exclusion of Other Remedies and Damages**

The foregoing remedy of repair, replacement or refund shall constitute the sole and exclusive remedy to the Owner. Under no circumstances, shall the liability of the Warrantor, or its affiliates or subsidiaries, under this warranty, exceed the purchase price of the FLAMESHIELD® product.

IN NO EVENT SHALL THE WARRANTOR, OR ITS AFFILIATES OR SUBSIDIARIES, BE LIABLE FOR CLAIMS OF PERSONAL INJURY OR FOR SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF THE TANK OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF THE SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, DOWNTIME COST, CLAIMS OF CUSTOMERS OF THE OWNER FOR SUCH DAMAGES, OR FOR DAMAGE TO PROPERTY, WHETHER SUCH CLAIM SHALL BE FOR BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY, AND WHETHER SUCH CLAIM ARISES OUT OF OR RESULTS FROM THIS LIMITED WARRANTY, OR EXPRESS OR IMPLIED WARRANTIES, OR FROM THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSTALLATION, TECHNICAL DIRECTION OF INSTALLATION, INSPECTION, REPAIR, OPERATION OR USE OF THE TANK.

**Consumer Notice**

The exclusion of indirect or consequential damages and the limitation of implied warranties herein may not be applicable to purchasers who are deemed "consumers" and who reside in states that do not allow the limitation of implied warranties or the exclusion of indirect or consequential damages otherwise applicable to consumers. Moreover, if you are deemed a "consumer", you may have specific legal rights in addition to those set forth in this warranty, which rights vary from state to state.

**Disclaimer of Other Warranties**

THE FOREGOING LIMITED WARRANTY IS THE ONLY WARRANTY MADE. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

**Financial Assurance**

Warrantor may have purchased insurance to cover some of its warranty obligations under this Limited Warranty. Such insurance would provide financial assurance for Warrantor's warranty obligations, but would not insure the Owner directly. If the Warrantor has purchased such insurance coverage, the Owner may request that the Warrantor provide a certificate of insurance to evidence Warrantor's purchase of such insurance.

Effective with installations on or after January 1, 2009.

# FLAMESHIELD®

## INSTALLATION, TESTING & MAINTENANCE INSTRUCTIONS

### 1.0 TANK SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION

1.1 The foundation must be designed to support the tank plus 100% of its contents when full. The foundation design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation should include any provisions necessary for seismic design.

The foundation design must also include provision for draining surface water away from the tank.

1.2 For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards.

1.3 Where the steel tank body is in contact with the earth, use a zinc grounding rod. Do not use a copper ground rod.

1.4 Where the steel tank body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (i.e., National Association of Corrosion Engineers) to provide the tank with appropriate protection from lightning without interference with the corrosion protection. Steel tanks in contact with the earth should not use copper grounding. Refer to STIR893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Tank Floors."

1.5 Tanks located in areas subject to flooding must be protected against floatation.

1.6 Aboveground tanks should not be located above underground utilities or directly beneath overhead power lines.

1.7 The tank shall be protected from vandalism and accidental damage in accordance with all applicable codes, i.e., NFPA 30, NFPA 30A, UFC, etc., as well as local environmental regulations and safety codes. Consult local authorities before installing this tank.

### 2.0 TANK HANDLING

2.1 Do not handle or install the tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of stable, flammable and combustible liquids.

2.2 Equipment for handling the tank shall be of adequate size to lift and position the tank. DO NOT DROP OR DRAG THE TANK.

2.3 Tanks shall be carefully handled using cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the tank using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.

2.4 DO NOT HANDLE OR MOVE THE TANK UNLESS IT IS EMPTY.

2.5 This is a stationary tank. Do not use this tank for transport of any product.

### 3.0 TESTING

#### 3.1 GENERAL REQUIREMENTS

3.1.1 An on-site air test of the tank may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing should be done as described below, or according to the tank manufacturer's specific instructions.

3.1.2 If the manufacturer has shipped the double wall tank with a vacuum drawn on the space between the walls, read and record the vacuum pressure. If the vacuum gauge reading is less than 12 inches Hg (40.5 kPa), contact the original tank manufacturer.

3.1.3 In lieu of the air pressure test described below, a vacuum may be applied to the interstice of a double-wall tank or to the interstice of a double-bottom tank. NOTE: This test procedure may be difficult to conduct for large (greater than 2000 gallons) tanks because of the size of the volume to be evacuated and difficulty in sealing the tank openings. DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK. A vacuum of 7" to 10" Hg is to be applied to the interstice and held for at least 24 hours with no more than a 2" Hg vacuum loss allowed. If this vacuum cannot be held for 24 hours, then perform the air test procedure described below.

3.1.3.1 Caution must be taken in applying a vacuum to the interstice of a tank and the testing must be stopped if any deformation appears on the tank.

#### 3.2 AIR PRESSURE TEST PROCEDURE FOR TANKS

3.2.1 If the tank is equipped with a long-bolt manway for emergency venting, do not remove the long-bolts from the long-bolt manway. Instead, long-bolt manways must be secured with C-clamps of appropriate size and strength to hold the vent cover in the sealed position to maintain the tank pressures required. If the tank is equipped with standard emergency vents, remove emergency vents and cap openings to hold tank pressure as required.

NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The regulated air supply test pressure used for this test shall be as follows:

a. Horizontal cylindrical tanks-Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa). Set pressure relief valve in test air supply line at 5.5 psi (38 kPa).

b. Vertical tanks-Not to be less than 1½ psig (10.4 kPa) nor more than 2 ½ psig (17 kPa) or that gauge pressure above 1 ½ psig (10.4 kPa) which first causes visible deformation of the tank. Set pressure relief valve in test air supply line at 2 ½ psig (17 kPa).

c. Rectangular tanks-Not more than 1 ½ psig (10.4 kPa). Set pressure relief valve in test air supply line at 1 ½ psig (10.4 kPa).

CAUTION: Do not leave pressurized tank unattended while pressure line/air line is connected. Do not stand in front of tank heads or fittings when pressurizing tank. Pressurizing of large tanks may result in the slight deformation of the top and bottom of vertical tanks, of the sides of rectangular tanks, and of the heads and ends of cylindrical tanks. Should deformation appear severe, immediately relieve the pressure. Aboveground vertical tanks may have a "weak shell to roof" seam. Do not air pressure test a tank with a "weak shell to roof" seam. Rather, fill these tanks with water and check for leaks.

#### 3.2.2 TANK PRESSURIZING PROCEDURE

3.2.2.1 The following air pressure testing does not apply to double-wall tanks equipped with interstitial vacuum monitoring systems. (In lieu of the air pressure test, the tank may be shipped from the factory with a vacuum in the tank interstice. Read and record the vacuum pressure. If the vacuum pressure gauge reading is less than 12 inches Hg (40.5 kPa), contact the tank manufacturer).

3.2.2.2 Install the test piping as shown in Figure 2. Temporarily plug, cap or seal off remaining tank openings to hold pressure.

3.2.2.3 Close valves A and B. Open valve C.

3.2.2.4 Connect the regulated test air supply line to test piping as shown in Figure 2.

3.2.2.5 Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate test air pressure given in paragraph 3.2.1 above.

3.2.2.6 Close valve A. Disconnect regulated test air supply line from the test piping.

3.2.2.7 Monitor test pressure in primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, the gauge, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.8 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the tank.

WARNING: Do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the tank may result. Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If the test pressure drops below the minimum requirements, close valve B, reconnect the air supply line and slowly open valve A to increase the pressure in the primary tank. When the required pressure is indicated on gauge 1 close valve A, disconnect the test air supply line. Open valve B to equalize the pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

3.2.2.9 Close valve B. Hold the test pressure in the interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.10 Proceed to Section 3.2.3, "Detection of Leaks" below.

#### 3.2.3 DETECTION OF LEAKS

3.2.3.1 Immediately apply the leak test solution to the tank exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are allowed. If leaks are found, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.

3.2.3.2 Open valve C, then slowly open valve B to release the test air pressure.

3.2.3.3 With tank depressurized, remove test piping, temporary plugs, caps and seals. Reinstall emergency relief vents, etc. which were removed in section 3.2.1 above. If tank is equipped with an emergency vent long-bolt manway, disconnect the C-clamps which were installed in Section 3.2.1 above.

WARNING: Emergency relief vents and long-bolt manways must be operable to prevent causing tank failure by over-pressurization.

### 4.0 TANK PIPING AND ACCESSORIES

4.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.

4.2 All unused tank openings must be properly sealed and tested to be liquid and vapor tight prior to putting the tank into service.

4.3 DO NOT WELD ON THE TANK, MODIFY OR PENETRATE THE TANK STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE TANK MANUFACTURER.

4.4 All tank accessories shall be installed as required per local codes. Anti-siphon devices, overflow shut-offs and alarms, vents gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.

### 5.0 LABELING

5.1 Tanks shall be labeled in accordance with all applicable codes.

### 6.0 MAINTENANCE

6.1 The tank operator should perform periodic walk-around inspections to identify and repair areas of damage to the vessel or the coating itself and check for proper drainage around the tank area.

6.2 It is imperative that the tank exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating selected should be of industrial quality.

6.3 Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the tank area.

6.3.1 For diked tanks, remove any product spills immediately. Be sure to dispose of hazardous material properly.

6.3.2 For diked tanks fitted with a drain, drain off water only. Drain openings are required to be maintained liquid tight.

6.4 The primary tank shall be inspected monthly for the presence of water 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 corrosion of tanks and lines. For procedures on how to check for the presence of water and removal of water, refer to API Recommended Practice 1621, Appendix D and API Standard 2610. Another source of information is 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.

6.5 failure to adhere with these maintenance instructions may void your warranty.

6.6 Tank relocation requirements - often aboveground storage tanks are relocated. The following instructions are to be followed when this occurs: All steps are to be documented and the documentation is to be kept for the life of the tank.

6.6.1 The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs. Cleaning of tanks must be per state and local jurisdiction requirements.

6.6.2 Refer to the STI Standard SP001, "Standard for the Inspection of Aboveground Storage Tanks" for requirements concerning tank inspections. This SP001 Standard details requirements for inspections based on the tank installation and age. A tank must undergo the appropriate inspection prior to relocation.

6.6.3 In addition, the tank must be subjected to a pressure (or vacuum) test as detailed paragraph 3.2 above except an inert gas, such as nitrogen, should be used for tanks that have previously held fuel.

Disclaimer: These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in aboveground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning tank installation. STI 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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