



Examination Standard for Funnels Used with Ignitable Liquids

Class Number 6065

January 2022

Foreword

This standard is intended to verify that the products and services described will meet stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of this standard is to present the criteria for examination of various types of products and services.

Examination in accordance with this standard shall demonstrate compliance and verify that quality control in manufacturing shall ensure a consistent and reliable product.

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1 INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states testing and certification requirements for funnels used with ignitable liquids.
- 1.1.2 Testing and certification criteria may include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

1.2 Scope

- 1.2.1 This standard applies to any component intended to or for use as funnels for use with ignitable liquids.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing. The advice of manufacturers, users, and loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of funnels for the purpose of obtaining certification. Funnels having characteristics not anticipated by this standard may be certified if performance equal, or superior, to that required by this standard is demonstrated.
- 1.3.3 This standard does not perform any testing to compare funnel material and chemical compatibility.

1.4 Basis for Certification

Certification is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:

- 1.4.1 Examination and tests on production samples shall be performed to evaluate:
- the suitability of the product;
 - the performance of the product as specified by the manufacturer and required for certification; and as far as practical,
 - the durability and reliability of the product.
- 1.4.2 An examination of the manufacturing facilities and audit of quality control procedures may be made to evaluate the manufacturer's ability to consistently produce the product which is examined and tested, and the marking procedures used to identify the product. Subsequent surveillance may be required by the certification agency in accordance with the certification scheme to ensure ongoing compliance.

1.5 Basis for Continued Certification

The basis for continual certification may include, but is not limited to, the following based upon the certification scheme and requirements of the certification agency:

- production or availability of the product as currently certified;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated by the certification;

- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory surveillance audits conducted as part of the certification agency's product follow-up program.

1.6 Effective Date

The effective date of this certification standard mandates that all products tested for certification after the effective date shall satisfy the requirements of this standard.

The effective date of this standard is eighteen (18) months after the publication date of the standard for compliance with all requirements.

1.7 System of Units

Units of measurement used in this standard are United States (U.S.) customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Conversion of U.S. customary units is in accordance with ANSI/IEEE/ASTM SI 10.

1.8 Terms and Definitions

For purposes of this standard, the following terms apply:

Funnel – a device allowing ignitable fluids to be transferred into 30 & 55 (110 & 200L) gallon drums.

Flame Arrester - a device which prevents a flame from progressing through a flammable gas/air mixture. The flame is quenched on the surfaces of a series of heat sinks through which the flame must pass. The emerging gases are sufficiently cooled to prevent re-ignition.

Fusible link - The fusible type link consists of two similar material plates joined together by a solder alloy. The solder melts at a predetermined temperature allowing the plates to separate at a specific temperature.

2 GENERAL INFORMATION

2.1 Product Information

Funnels are supplied in various capacities and configurations. Funnels are usually manufactured from steel with a chemically resistant powder coating to ensure durability and long service life. Funnels are also manufactured from stainless steel. Funnels are supplied with either a manual or self-closing lid mechanism operated by a fusible link. Funnels are provided with flame arresters and dip tubes for use with low flash point ignitable liquids to prevent an external flame from flashing into the drum and to minimize the generation of static electricity. Funnels for viscous liquids may not have a flame arrester to ensure the free flow of liquid into the drum. Funnels shall be constructed of noncombustible materials that will not deform or melt when exposed to a fire. The funnel is positioned into the 2 in. bung opening of the 30 or 55 gallon drum. Other designs meeting the criteria of this standard may also be considered for certification.

2.2 Certification Application Requirements

The manufacturer shall provide the following preliminary information with any request for certification consideration:

- A complete list of all models, types, sizes, and options for the products or services being submitted for certification consideration;
- general assembly drawings, complete set of manufacturing drawings, materials list, anticipated marking format, nameplate format, brochures, sales literature, spec. sheets, installation and operating instructions
- the number and location of manufacturing facilities.

All documents shall identify the manufacturer's name, document number or other form of reference, title, date of last revision, and revision level. All documents shall be provided with English translation.

2.3 Requirements for Samples for Examination

2.3.1 Following authorization of a certification examination, the manufacturer shall submit samples for examination and testing based on:

- Sample requirements to be determined by the certification agency

2.3.2 Requirements for samples may vary depending on design features, results of prior or similar testing, and results of any foregoing tests.

2.3.3 The manufacturer shall submit samples representative of production. Any decision to use data generated using prototypes is at the discretion of the certification agency.

2.3.4 It is the manufacturer's responsibility to provide any necessary test fixtures, such as those which may be required to evaluate funnels.

3 GENERAL REQUIREMENTS

3.1 Review of Documentation

- 3.1.1 During the initial investigation and prior to physical testing, the manufacturer's specifications and details shall be reviewed to assess the ease and practicality of installation and use. The certification examination results may further define the limits of the final certification.

3.2 Markings

- 3.2.1 Marking on the product or, if not possible due to size, on its packaging or label accompanying the product, shall include the following information:

- name and address of the manufacturer or marking traceable to the manufacturer;
- date of manufacture or code traceable to date of manufacture or lot identification;
- model number, size, rating, capacity, etc., as appropriate.

When hazard warnings are needed, the markings should be universally recognizable.

- 3.2.2 The model or type identification shall correspond with the manufacturer's catalog designation and shall uniquely identify the certification agency's mark of conformity.

- 3.2.3 The certification agency's mark of conformity shall be displayed visibly and permanently on the product and/or packaging as appropriate and in accordance with the with the requirements of the certification agency. The manufacturer shall exercise control of this mark as specified by the certification agency and the certification scheme.

- 3.2.4 All markings shall be legible and durable.

3.3 Manufacturer's Installation and Operation Instructions

The manufacturer shall provide the user with:

- instructions for the installation, maintenance, and operation of the product;
- facilities for repair of the product and supply replacement parts; and
- services to ensure proper installation, inspection, or maintenance for products of such nature that it would not be reasonable to expect the average user to be able to provide such installation, inspection, or maintenance.
- Information regarding funnel material and ignitable liquid compatibility

3.4 Calibration

- 3.4.1 Each piece of equipment used to verify the test parameters shall be calibrated within an interval determined on the basis of stability, purpose, and usage. A copy of the calibration certificate for each piece of test equipment is required. The certificate shall indicate that the calibration was performed against working standards whose calibration is certified and traceable to an acceptable reference standard and certified by an ISO/IEC 17025 accredited calibration laboratory. The test equipment shall be clearly identified by label or sticker showing the last date of the calibration and the next due date. A copy of the service provider's accreditation certificate as an ISO/IEC 17025 accredited calibration laboratory should be available.

- 3.4.2 When the inspection equipment and/or environment is not suitable for labels or stickers, other methods such as etching of control numbers on the measuring device are allowed, provided documentation is maintained on the calibration status of thus equipment.

4 PERFORMANCE REQUIREMENTS

4.1 Hydrostatic Pressure Test

4.1.1 Requirement

The submitted funnel assembly will be subjected to a hydrostatic pressure test for a period of 1 minute. There shall be no air leaking from the funnel lid assembly during or at the end of the 1 minute time period.

4.1.2 Test/Verification

The submitted funnel assembly will be subjected to a hydrostatic pressure test of 1 psi (7 kPa) for a period of 1 minute. The submitted sample must be completely assembled with its gasket. The Hydrostatic Pressure Test shall be as follows:

1. Wrap Teflon tape around 2 in. NPT thread section and connect 2 in. NPT coupling to funnel assembly.
2. Wrap Teflon tape around both threaded sections of the 2 in. NPT nipple and thread nipple into the coupling.
3. Thread the 2 in. NPT cap to nipple. Connect the air hose to the air regulator/pressure gauge arrangement
4. Connect air hose to the funnel assembly
5. The funnel lid must be fully closed before submerging the lid portion of the funnel into the water tank or sink.
6. Turn on air supply, adjust pressure to 1 psi. Allow 1 psi of air to enter the funnel assembly for a period of 1 minute
7. Note if any air is leaking from the lid assembly during the 1 minute time.

4.2 Flame Arresters

4.2.1 Requirement

Flame arresters will be subjected to a fire exposure test. The Flame arrestor must not allow the ignition source to ignite the gas/air mixture allowing the plastic sheet to rupture. The plastic sheet must remain intact.

4.2.2 Test/Verification

The submitted flame arresters shall be subjected to a fire exposure test within a controlled environment. Flame arrester testing shall be as follows:

1. Attach the Swagelok fuel inlet valve to the "gas in" propane supply line.
2. Attach the propane supply line to the Flame Arrestor test fixture.
3. Connect Swagelok "gas out" valve from the steel cylinder to gas analyzer.
4. Attach the Swagelok to "gas out" exhaust line on the test fixture
5. Using a pipe tee connection, thread the Type K thermocouple through the exhaust line and into the flame arrester test fixture. The thermocouple bulb shall be located near the spark plug.
6. Secure the flame arrester sample to the test fixture, rubber gasket must be in place prior to the flame arrester being secured to the fixture.
7. Connect the spark plug cable to the test fixture and connect grounding connection
8. Secure the plastic sheet over the cylinder opening with the rubber band and band clamp.
9. Close exhaust valve
10. Open propane gas line with a 4-4.2% air mixture, air flow set at 130 lpm.

11. After the air/gas mixture has stabilized, simultaneously open the exhaust valve and energize the spark plug.
12. Confirm ignition of the spark plug from the temperature plot. If no ignition is indicated, repeat the procedure.
13. If the plastic sheet explodes, this constitutes a product failure, if plastic sheet remains intact, repeat the test on another flame arrester sample until 5 tests have been completed on each flame arrester design

4.3 Self-Closing Lid Closure Fire Exposure Test (if applicable)

4.3.1 Requirement

The funnel assembly with a self-closing lid will be subjected to a fire exposure test. The average time for the lid to close, at the maximum fill level shall not exceed 15 seconds. No individual test shall exceed 30 seconds after being exposed to the fire. Ten (10) seconds after each lid closure test, the lid shall be re-opened, there shall be no visible flame at this time

4.3.2 Test/Verification

The self-closing lid on the funnel assembly will be closed completely extinguishing the fire. Testing for Fire Exposure shall be as follows:

1. An empty 55 gallon (208 L) steel drum is positioned under the exhaust hood.
2. Remove flame arrester tube and replace the tube with a pipe plug
3. Thread the funnel assembly into the 2 NPT drum opening.
4. Fill the funnel assembly with water to its maximum rated capacity
5. Float 16 oz. (1/2 L) of heptane on top of the water
6. Arrange the lid suspension mechanism, allowing the mechanism to hold the lid open.
7. Using the butane light, ignite the heptane fuel.
8. Record the time it takes for the fusible link to dis-engage allowing the lid to close.
9. After 10 seconds, open the lid, there shall be no visible flames
10. Repeat this process two more times, the average time for the lid to close must not be greater than 15 seconds and no one individual test is to exceed 30 seconds.

4.4 Flow Rate Test

4.4.1 Requirement

The submitted funnel assembly will be subjected to a flow rate test. At the end of the 1 minute time, the weight of the fluid in the barrel must be at least 83 lbs. (37.7 kg).

4.4.2 Test/Verification

The submitted funnel assembly shall be subjected to a minimum 10 gpm (0.63 L/sec) [+/- 4 oz./min (0.1L/min.)] flow rate test. The Flow Rate test shall be as follows:

1. Thread the funnel assembly with flame arrester into the 55 gal (208 L) drum and position it on the weigh scale platform, note weight of assembly. Tare this weight.
2. Fill the bulk container with 20 or more gallons (76 L) of water. Fill level is visible on the side of the container.
3. Position the IBC container over the funnel assembly.
4. Open the faucet on the container and start the stopwatch.
5. Record the time the weigh scale reaches 83 lbs.(37.7 kg)
6. This time must be within one minute.

5 OPERATIONS REQUIREMENTS

5.1 Demonstrated Quality Control Program

5.1.1 A quality assurance program is required to assure that subsequent funnels produced by the manufacturer shall present the same quality and reliability as the specific funnels examined. Design quality, conformance to design, and performance are the areas of primary concern.

- Design quality is determined during the examination and tests, and is documented in the certification report.
- Continued conformance to this standard is verified by the certifier's surveillance program.
- Quality of performance is determined by field performance and by periodic re-examination and testing.

5.1.2 The manufacturer shall demonstrate a quality assurance program which specifies controls for at least the following areas:

- existence of corporate quality assurance guidelines;
- incoming quality assurance, including testing;
- in-process quality assurance, including testing;
- final inspection and tests;
- equipment calibration;
- drawing and change control;
- packaging and shipping; and
- handling and disposition of non-conforming materials.

5.1.3 Documentation/Manual

There should be an authoritative collection of procedures/policies. It should provide an accurate description of the quality management system while serving as a permanent reference for implementation and maintenance of that system. The system should require that sufficient records are maintained to demonstrate achievement of the required quality and verify operation of the quality system.

5.1.4 Records

To assure adequate traceability of materials and products, the manufacturer shall maintain a record of all quality assurance tests performed, for a minimum period of two years from the date of manufacture.

5.1.5 Drawing and Change Control

- The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in the certification report, must be reported to, and authorized by the certification agency prior to implementation for production.
- Records of all revisions to all certified products shall be maintained.

5.2 Surveillance Audit

5.2.1 An audit of the manufacturing facility may be part of the certification agency's surveillance requirements to verify implementation of the quality assurance program. Its purpose is to determine that the manufacturer's equipment, procedures, and quality program are maintained to ensure a uniform product consistent with that which was tested and certified.

5.2.2 Certified products or services shall be produced or provided at, or provided from, location(s) disclosed as part of the certification examination. Manufacture of products bearing a certification mark is not permitted at any other location prior to disclosure to the certification agency

5.3 Installation Inspections

Field inspections may be conducted to review an installation. The inspections are conducted to assess ease of application, and conformance to written specifications. When more than one application technique is used, one or all may be inspected at the discretion of the certification agency.

5.4 Manufacturer's Responsibilities

The manufacturer shall notify the certification agency of changes in product construction, components, raw materials, physical characteristics, coatings, component formulation or quality assurance procedures prior to implementation.

6 BIBLIOGRAPHY

ISO/IEC 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*.