



GUIDE  
FOR  
THE INVESTIGATION  
OF  
STRAINERS FOR FLAMMABLE  
FLUIDS AND ANHYDROUS AMMONIA

**UNDERWRITERS' LABORATORIES OF CANADA**

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FOR  
THE INVESTIGATION  
OF  
STRAINERS FOR FLAMMABLE  
FLUIDS AND ANHYDROUS AMMONIA

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# TABLE OF CONTENTS

|                                                             | <u>PAGE</u> |
|-------------------------------------------------------------|-------------|
| General . . . . .                                           | 1           |
| 1. Scope . . . . .                                          | 1           |
| 2. General . . . . .                                        | 2           |
| Construction. . . . .                                       | 2           |
| 3. Assembly. . . . .                                        | 2           |
| 4. Materials . . . . .                                      | 3           |
| 5. Bodies and Covers . . . . .                              | 5           |
| 6. Stuffing Boxes. . . . .                                  | 6           |
| 7. Springs . . . . .                                        | 6           |
| Performance . . . . .                                       | 7           |
| 8. General . . . . .                                        | 7           |
| 9. Deformation and External Leakage Test . . . . .          | 7           |
| 10. Hydrostatic Strength Test . . . . .                     | 8           |
| 11. Element Collapse Test . . . . .                         | 9           |
| 12. Pressure Drop Test - Strainers for Oil Burners. . . . . | 9           |
| 13. Clogging Test - Strainers for Oil Burners. . . . .      | 13          |
| 14. Mercurous-Nitrate Immersion Test . . . . .              | 16          |
| Manufacturing and Production Tests. . . . .                 | 16          |
| 15. General . . . . .                                       | 16          |
| Marking . . . . .                                           | 17          |
| 16. General . . . . .                                       | 17          |



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In Reply  
Please Refer to ULC Subject C331-1975

## GUIDE FOR THE INVESTIGATION OF STRAINERS FOR FLAMMABLE FLUIDS AND ANHYDROUS AMMONIA

### GENERAL

#### 1. Scope

1.1 These requirements cover complete self-contained strainer or filter assemblies intended for use with designated flammable fluids and anhydrous ammonia (fertilizer grade) in residential and commercial fuel burning, dispensing, and handling facilities. Although these devices are designated "strainers," they may be either strainers or filters according to the common terminology of the industry.

1.2 The term "flammable fluids" as used in this Guide means fuel oil, gasoline, kerosene, and similar petroleum products, liquefied petroleum gas (LP-Gas), and manufactured and natural fuel gases.

1.3 These requirements do not cover the following:

- A Strainers for handling liquids under cryogenic conditions;
- B Strainers for marine use;
- C Strainers for automotive fuel lines;
- D Strainers for handling refrigerants; and
- E Strainers for use in petroleum and petrochemical process systems in such facilities as refineries, chemical plants, and utility power plants.

## 2. General

2.1 A component of a strainer shall comply with the requirements for that component, except that such requirements may be modified if appropriate for the particular application.

2.2 All parts of a strainer which are subjected to pressure during normal usage shall withstand, without rupture or permanent distortion, a hydrostatic pressure equivalent to five times the rated pressure of the strainer, but not less than 60 pounds per square inch (psi).

2.3 If a value for measurement as given in these requirements is followed by an equivalent value in other units, the first stated value is to be regarded as the requirement. A given equivalent value may only be approximate.

## CONSTRUCTION

### 3. Assembly

3.1 A strainer shall include all of the components necessary for its normal function and installation, and shall be furnished as a complete assembly.

3.2 The construction of a strainer shall be such that parts can be reassembled in the proper manner after being dismantled to the extent needed for normal servicing.

3.3 A strainer shall be constructed so that, when in its normal operating position, any air trapped within will not reduce the rate of liquid flow or the effective strainer element capacity.

3.4 A strainer employing a straining element intended to be cleaned or replaced shall permit the removal of the element without disconnecting piping.

3.5 A strainer element shall be constructed to hold in its intended position to insure that joints or seals required to prevent fluid bypass of the element will be maintained.

3.6 A strainer shall be such that, when the screen or filter element is removed for cleaning, all foreign matter (sediment and dirt) will be removed or can be removed without the probability of any foreign matter being deposited in the outlet side of the strainer.

3.7 Screws or bolts used to attach parts which are detached for normal care or servicing of the strainer or element shall be capable of holding upon the application of the torques indicated in Table 1 after removal and replacement.

T A B L E 1

## TORQUE REQUIREMENTS FOR SCREWS OR BOLTS

| Size<br>Inch | Torque<br>Pound-Inches |
|--------------|------------------------|
| No.8         | 20                     |
| No.10        | 25                     |
| 1/4 inch     | 100                    |
| 5/16 inch    | 200                    |
| 3/8 inch     | 350                    |
| 7/16 inch    | 550                    |
| 1/2 inch     | 800                    |
| 9/16 inch    | 1200                   |
| 5/8 inch     | 1600                   |

## 4. Materials

4.1 Fluid-confining or operating parts of a strainer, if failure of the part will allow leakage or unsafe operation, shall have sufficient strength and durability to ensure safe and reliable service of the parts and of the assembly.

4.2 To conform to Clause 4.1, a material (except a seal ring or a gasket) is to have a melting point (solidus temperature) of not less than 950°F and a tensile strength of not less than 10,000 psi at 400°F.

4.3 A part in contact with the fluid to be handled shall be resistant to the action of such fluid.

4.4 The common metals are not attacked by dry ammonia. Zinc, copper, and copper base alloys such as brass are subject to rapid destructive action by ammonia in the presence of water and should not be used.

4.5 Nonductile cast iron (regular gray iron) shall not be used for bodies or closures for anhydrous ammonia or LP-gas strainers.

4.6 A synthetic-rubber part in contact with one of the fluids indicated in Table 2 shall not show excessive volume change or loss of weight, when considered on the basis of its intended function, following immersion for 70 hours at a temperature of  $73.4 \pm 3.6^\circ\text{F}$  in the specified test liquid.

4.7 A change in volume of not more than 25 per cent swelling (40 per cent in Reference Fuel C ) or 1 per cent shrinkage, and a weight loss (extraction) of not more than 10 per cent is considered as indicating compliance with Clause 4.6.