

Subject 21

May 19, 2017

SUMMARY OF TOPICS

The following changes in requirements to the Standard for LP-Gas Hose, UL 21, are being proposed:

1. Revision to the moist ammonia-air stress cracking test

STP BALLOTS AND ALL COMMENTS DUE: June 19, 2017

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. Revision to the moist ammonia-air stress cracking test

RATIONALE

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Different countries around the world use ASTM B858 and ISO 6957 for testing their products for stress corrosion cracking. UL proposes to harmonize with Sections 6 Apparatus, 7 Reagents and Materials, 8 Test Media, 9.3 to 9.4 Test Sample Preparation and 10.1 to 10.4 Test Procedure of ASTM B 858-06, Standard Test Method for Ammonia Vapor for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys. The pH level of the test solution shall be High 10.5 $\pm$ 0.1 and the exposure temperature shall be 25°C $\pm$ 1°C for all testing. This change will also reduce the test from ten days to one day and help provide a more consistent method to conduct the test for manufacturers.

PROPOSAL

20 Moist Ammonia-Air Stress Cracking Test

20.1 After being subjected to the conditions described in 20.2 – 20.5, a brass part containing more than 15 percent zinc shall: ~~show no evidence of cracking when examined using 25X magnification.~~

a) Show no evidence of cracking, delamination, or degradation; or

b) Perform as intended when tested as described in 20.5.

20.2 ~~Each test sample~~ One test sample of each size is to be subjected to the physical stresses normally imposed on or within a part as the result of assembly with other components. Such stresses are to be applied to the sample prior to and maintained during the test. A ferrule or end-connecting fitting used in the assembly of a flexible connector is to be tested prior to crimping the hose.

20.3 Pipe-threaded ends (NPT) are to be torqued to brass companion fittings as specified in Table 20.1. Other threaded parts are to be tightened to the brass companion fittings to the degree required to produce a leaktight assembly. Samples with female threads other than tapered pipe threads shall be torqued as specified by the manufacturer. Samples with male threads are evaluated as received. Teflon tape or pipe thread compound are not to be used on the threads.

20.4 Three samples are to be degreased and then continuously exposed in a set position for ten days to a moist ammonia-air mixture maintained in a glass chamber 12 by 12 by 12 inches (305 by 305 by 305 mm) having a glass cover. The samples are then to be tested in accordance with Apparatus, Section 6, Reagents and Materials, Section 7, Test Media, Section 8, Test Sample Preparation (9.3 – 9.4), Test Procedure (10.1 – 10.4) of the Standard Test Method for Ammonia Vapor Test for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys, ASTM B858-06, except the pH level of the test solution shall be High 10.5 $\pm$ 0.1 and the exposure temperature shall be 25 $\pm$ 1°C.

20.5 Aqueous ammonia (600 ml) having a specific gravity of 0.94 is to be maintained at the bottom of the glass chamber below the samples. The samples are to be positioned 1-1/2 in (38.1 mm) above the aqueous ammonia solution and supported by an inert tray. The moist ammonia-air mixture in the chamber is to be maintained at atmospheric pressure and at a temperature of 34 $\pm$ 2°C (93 $\pm$ 3.6°F). After the exposure period, the samples are to be examined for cracks or other signs of stress corrosion using a microscope having a magnification of 25X. Pressure-confining parts exhibiting degradation as indicated in 20.1 as a result of the test exposure described in 20.2, 20.3, and 20.4 shall withstand the proof pressure test for 5 minutes.

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