

AS 1869.1:2023



STANDARDS
Australia



Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas

Part 1: Non-metallic liners



AS 1869.1:2023

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- Gas Energy Australia
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Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas

Part 1: Non-metallic liners

Originated in Australia as AS 1869—1976.
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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee AG-013, Components used for Gas Appliances and Equipment, to supersede in part AS/NZS 1869:2012, *Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide specific requirements to ensure performance, safety, durability and fitness for purpose of hose and hose assemblies with non-metallic tubes or liners in the gas industry.

AS/NZS 1869:2012 has been revised and divided into three parts. AS 1869.0 covers general requirements for hose and hose assemblies, AS 1869.1 covers requirements specific to non-metallic liners and AS 1869.2 covers requirements specific to metallic liners (see [Appendix E](#) for a comparison guide).

The other major change incorporated in this document from the 2012 edition is the re-assessment of the allowable levels of extractable material in each class of hose.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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Australian Standard®

Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas

Part 1: Non-metallic liners

Section 1 Scope and general

1.1 Scope

This document sets out specific requirements and test methods for hose and hose assemblies with non-metallic tubes and liners for liquefied petroleum gases (LP Gas) (liquid and gaseous phases), natural gas, town gas manufactured from oil products, tempered LP Gas and simulated natural gas in transport, automotive, industrial and domestic applications. It provides for hose up to and including 100 mm inside diameter and 2.6 MPa maximum working pressure.

This document does not specify requirements for LP Gas hose for welding. Hoses for welding are covered by AS/NZS 1335.

NOTE 1 A guide to the user for continued in-service performance testing of hose assemblies is included in AS 1869.0:2023 Appendix D.

NOTE 2 This document should be read in conjunction with AS 1869.0:2023.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1869.0, *Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas, Part 0: General requirements*

AS 1869.2, *Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas, Part 2: Metallic liners*

AS 2103, *Dial gauges and dial test indicators (metric series)*

1.3 Terms and definitions

For the purposes of this document, the terms and definitions in AS 1869.0 apply.

1.4 Classification

The classification of hose and hose assemblies in AS 1869.0:2023 Clause 1.4 and Table 1.1 applies to this document.

1.5 Materials and construction

The general requirements for materials, construction, gas permeation, dimensions and tolerances in AS 1869.0:2023 Clause 1.5 apply to this document.

1.6 Marking

Each manufactured hose assembly with a non-metallic tube or liner shall be permanently and clearly marked with the information set out in AS 1869.0:2023 Clause 1.6.

1.7 Hose assemblies

The general requirements for hose assemblies including couplings, pigtails and testing set out in AS 1869.0:2023 Clause 1.7 apply to this document.

Section 2 Performance requirements

2.1 General

This section sets out requirements specific to hose and hose assemblies with non-metallic inner tubes or liners.

NOTE See [Appendix C](#) for the relevant test methods and [Appendix A](#) for illustrations of the test apparatus.

2.2 Resistance to gas

2.2.1 Lining

When Classes A, B, C and D are tested in accordance with [Clause C.1](#) and Classes E, F, G and H are tested in accordance with [Clause C.2](#), hose lining shall conform to the requirements specified in [Table 2.1](#).

Table 2.1 — Maximum allowable extractables

Class	Maximum allowable extractables
A, B, C, D	10 % change from initial mass, using Clause C.1
E, F	900 mg/m of hose length, using Clause C.2
G	25 mg/m of hose length, using Clause C.2
H	See Figure C.2.1 , using Clause C.2

NOTE 1 Plasticizers may be removed from hose linings by the actions of condensation and subsequent vaporization of LP Gas, particularly in the case of Class E and Class F hoses. Further, plasticizers that have a viscosity below 0.07 Pa.s should not be used as the major component of the extractables because they are more likely to pass through small orifices and cause damage to components further downstream.

NOTE 2 Reduction of extractable hose and hose assemblies is outlined in [Appendix F](#).

2.2.2 Hose assembly

When tested in accordance with [Clause C.3](#), the hose assembly shall show no visible signs of fracture, cracks, leakage or movement between hose and fittings.

2.3 Hydrostatic pressure

Hose and hose assemblies with non-metallic tubes or liners shall conform to the hydrostatic pressure requirements in AS 1869.0:2023 Clause 2.3.

2.4 Resistance to oil

Hose and hose assemblies with non-metallic tubes or liners shall conform to the oil resistance requirements in AS 1869.0:2023 Clause 2.4.

2.5 Resistance to ozone

Hose and hose assemblies with non-metallic tubes or liners shall conform to the ozone resistance requirements in AS 1869.0:2023 Clause 2.5.

2.6 Resistance to flexing and mechanical loads

Hose and hose assemblies with non-metallic tubes or liners shall conform to the resistance to flexing and mechanical load requirements in AS 1869.0:2023 Clause 2.6 when tested in accordance with Clause C.4 of that document.

2.7 Electrical properties

Where electrical continuity is specified, hose and hose assemblies with non-metallic tubes or liners shall conform to the electrical requirements in AS 1869.0:2023 Clause 2.7.

2.8 Resistance to cold bending

Hose and hose assemblies with non-metallic tubes or liners shall conform to the resistance to cold bending requirements in AS 1869.0:2023 Clause 2.8.

2.9 Resistance to kinking

Hose and hose assemblies with non-metallic tubes or liners shall conform to the resistance to kinking requirements in AS 1869.0:2023 Clause 2.9 when tested in accordance with Clause C.5 of that document.

2.10 Resistance to crushing

2.10.1 Hose without gas

When hose of internal diameter not exceeding 25 mm which does not contain gas is subjected to a crushing force of 340 N applied evenly over a length of 25 mm for 30 s, it shall, after removal of the force, conform to the requirements of AS 1869.0:2023 Clause 2.3.1.

2.10.2 Hose containing gas

When hose containing gas is tested in accordance with [Clause C.6](#), the condition of the hose shall be such that the gas flow rate is not less than 25 % of its initial value.

2.11 Permeability

Hose and hose assemblies with non-metallic tubes or liners shall conform to the permeability requirements in AS 1869.0:2023 Clause 2.11 when tested in accordance with Clause C.7 of that document.

2.12 Flame propagation characteristics of hose

Hose and hose assemblies with non-metallic tubes or liners shall conform to the flame propagation requirements in AS 1869.0:2023 Clause 2.12 when tested in accordance with Clause C.8 of that document.

2.13 Adhesion

When hose components with bonded wall construction are tested in accordance with AS 1869.0:2023 Clause C.15, the adhesion at all interfaces between lining, reinforcement plies and cover shall be at least 1.75 kN/m before ageing and at least 1.25 kN/m after ageing at $70\text{ °C} \pm 2\text{ °C}$ for $70\text{ h} \pm 1\text{ h}$ in accordance with [Clause C.16](#) of this document. As ply adhesion is particularly sensitive to temperatures, the test shall be conducted under conditions of $20\text{ °C} \pm 2\text{ °C}$ and $65\text{ % RH} \pm 10\text{ % RH}$.

The hose shall also meet the above requirements after it has been tested in accordance with AS 1869.0:2023 Clause C.7.

2.14 Accelerated ageing

2.14.1 Classes A, C, E and H hose

When Classes A, C, E and H hose are aged at $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 72 h in accordance with [Clause C.16](#), and then tested in accordance with [Clause C.17](#), the tensile strength and elongation at break of the lining and cover shall not vary by more than 35 % from the corresponding values determined by applying the test to unaged control samples.

2.14.2 Classes B, D and G hose

When Classes B, D and G hose are aged at $135\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 72 h in accordance with [Clause C.16](#), and then tested in accordance with [Clause C.17](#), the tensile strength and elongation at break of the lining and cover shall not vary by more than 40 % from the corresponding values determined by applying the test to unaged control samples.

2.14.3 Class F

When Class F hose is aged at $125\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 72 h in accordance with [Clause C.16](#), and then tested in accordance with [Clause C.17](#), the tensile strength and elongation at break of the lining and cover shall not vary by more than 40 % from the corresponding values determined by applying the test to unaged control samples.

2.15 Hose and coupling compatibility

Hose and hose assemblies with non-metallic tubes or liners shall conform to the hose and coupling compatibility requirements in AS 1869.0:2023 Clause 2.15 when tested in accordance with Clause C.18 and then tested further in accordance with Clause C.10 of that document.

2.16 Resistance to corrosion

Hose and hose assemblies with non-metallic tubes or liners shall conform to the resistance to corrosion requirements in AS 1869.0:2023 Clause 2.16 when tested in accordance with Clause C.20 of that document.

2.17 Resistance to ultraviolet degradation

Hose and hose assemblies with non-metallic tubes or liners shall conform to the resistance to ultraviolet light degradation requirements in AS 1869.0:2023 Clause 2.17 when tested in accordance with Clause C.21 of that document.

2.18 Durability of marking

Hose and hose assemblies with non-metallic tubes or liners shall conform to the marking requirements in AS 1869.0:2023 Clause 2.18 when tested in accordance with Clause C.22 of that document.

2.19 Details of sample specification

Samples of hose and hose assemblies with non-metallic tubes or liners should be supplied with specifications containing the information given in AS 1869.0:2023 Appendix B.

Appendix A (informative)

Illustrations of testing apparatus

Figures A.1 to A.3 illustrate the apparatus to be used in the tests listed in Appendix C.

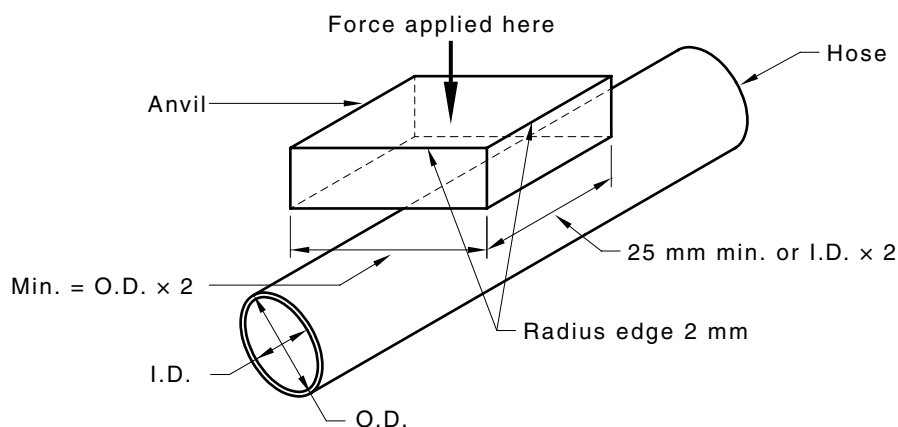
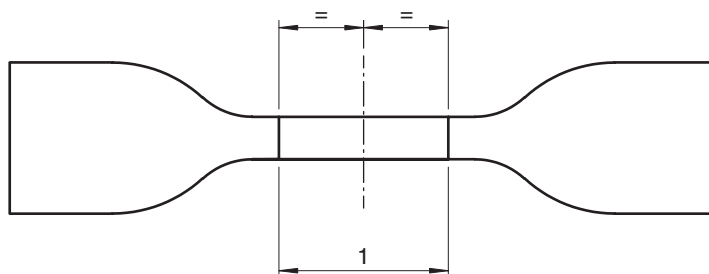


Figure A.1 — Assembly for crushing



Key

1 Test length

[SOURCE: ISO 37:2017 Figure 2 © ISO, reproduced with permission]

Figure A.2 — Shape of dumbbell test pieces