

13-GP-2
11 August 1961
CANCELLATION
September 1969

CANADIAN GOVERNMENT SPECIFICATION BOARD

Standard
for

HOSE: FORESTRY, LINED

This standard is hereby cancelled because this material is covered by CSA Standard B89.8-1969, Lined Forestry Hose, available from the Canadian Standards Association, 77 Spencer Street, Ottawa 3, Canada.



CANADA

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

SPECIFICATION

FOR

HOSE; FORESTRY, LINED

13-GP-2

11 AUGUST 1961

ARCHIVES COPY

THIS SPECIFICATION APPLIES TO WOVEN, LINED HOSE WITH NO EXTERNAL COATING, OF THE SIZE COMMERCIALY KNOWN AS 1½ INCH, SUITABLE FOR USE IN FIGHTING FOREST FIRES.

NATIONAL RESEARCH COUNCIL, OTTAWA, CANADA

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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification
for

HOSE; FORESTRY, LINED

1. DEFINITION

1.1 This specification applies to woven, lined hose with no external coating, of the size commercially known as 1-1/2 inch, suitable for use in fighting forest fires.

2. APPLICABLE PUBLICATIONS

2.1 The following publications are applicable to this specification:

2.1.1 CGSB 4-GP-2, Canadian Standard Textile Test Methods.

2.1.2 ASTM Method D573, Method of Test for Accelerated Aging of Vulcanized Rubber by the Oven Method.

2.1.3 ASTM Method D412, Method of Test for Tension Testing of Vulcanized Rubber.

2.1.4 CSA Specification B89-1954, 1-1/2 inch Fire Hose Couplings, Screw-Thread, and Tail Piece Internal Diameters.

2.2 Reference to the above publications is to the issues in effect on the date of invitation to tender, unless otherwise specified.

3. GENERAL REQUIREMENTS

3.1 Jacket - The hose shall be woven from first quality yarns suitable for the purpose, which shall be virtually free from knots, shives and other imperfections. The fabric shall be of uniformly even and firm texture and shall be free from all defects that might affect serviceability. On request the vendor shall make available to the purchaser information on the fibers used. The warp yarns shall lie in a direction parallel to the length of the hose and shall cover the weft yarns sufficiently to protect them from abrasion.

3.2 Lining - The lining shall be free from pits and other manufacturing imperfections, and shall have a smooth interior surface other than unevenness due to weave. The lining shall adhere to the jacket over the entire surface.

Par. 6.9

4. DETAIL REQUIREMENTS

4.1 Weight - The hose shall have a weight, when in equilibrium at 65 ± 2 per cent relative humidity and $70 \pm 2^\circ\text{F}$ ($21.1 \pm 1.1^\circ\text{C}$) not greater than 18.0 pounds per 100 feet, exclusive of fittings. The measured weight shall be reported to the nearest 1/10 pound.

4.2 Diameter - The internal diameter of the hose as received shall be not less than 1-33/64 inches. The outside diameter of the hose shall be such that a standard coupling as specified in CSA Standard B89-1954, having a lip and bowl diameter of 1-11/16 inches, can be attached to the hose by the purchaser using regular equipment and expansion rings 1.500 ± 0.003 inches in outside diameter.

Par. 6.2

4.3 Length - Hose as delivered to the purchaser shall be in 100-foot lengths between coupling shoulders unless otherwise specified by the purchaser.

Par. 6.3

4.4 Elongation - When the internal pressure is increased from 10 to 300 psi, the hose shall not increase in length by more than 10 per cent of its length at 10 psi. There shall be no shrinkage.

Par. 6.7

4.5 Twist - The twist, if any, of the hose shall be in a direction that would tend to tighten couplings with a standard thread.

Par. 6.7

4.6 Pressure Test - After being subjected to leaching, cold flexing, and soil burial by the procedures described in par. 6.4, 6.5 and 6.6, the hose, including connections to the couplings, shall not fail; i.e., it shall not leak or burst at pressures up to and including 600 psi. Wet patches on the hose during the test shall be considered failures. Leaks at the couplings that drip but do not run shall not be considered failures.

Par. 6.7

4.7 Heat Resistance - After being subjected to the pressure test detailed in par. 4.6, the hose shall not fail in the heat resistance test.

Par. 6.8

4.8 Accelerated Aging of Lining * - The lining shall pass an accelerated test acceptable to the purchaser. For natural rubber linings of adequate thickness the accelerated test shall be as given in 4.8.1.

4.8.1 After air-oven aging, the tensile strength and ultimate elongation of natural rubber lining from unleached hose shall be not less than 60 per cent of the strength and elongation of unaged specimens. The tensile strength and ultimate elongation of unaged lining shall be not less than 1,800 psi and not less than 700 per cent respectively.

Par. 6.10

5. PREPARATION FOR DELIVERY

5.1 Marking - Both ends of each hose shall be permanently marked, in letters at least 3/4 inch high, starting two to four feet from each end, with the following:

Specification number

Year of manufacture

FORESTRY

Name of prime manufacturer and/or vendor

* See par. 7.4.

6. INSPECTION

6.1 Sampling

6.1.1 For Type Tests - A minimum of three lengths, with couplings attached, each 10 feet 3 inches $\pm$ 3 inches between the couplings, and one 10-foot length without couplings, are required for type tests.

6.1.2 For Purchase - arranged between purchaser and vendor. It is recommended that at least one length from each delivery, or from each 10,000 feet when deliveries are greater than 10,000 feet, be tested.

6.2 Diameter

6.2.1 Apparatus - The diameter shall be measured using a tapered plug gauge having a taper of 3/8 inch per foot, marked to indicate variations of 1/64 inch in diameter.

6.2.2 Method - Cut off and discard at least 6 inches from the uncoupled sample length. Insert the tapered plug gauge in the freshly cut end until a close fit is obtained without forcing. The diameter of the gauge at the end of the sample shall be reported as the actual internal diameter of the hose.

6.3 Length - The length of hose shall be measured on a smooth level surface, with kinks, folds and bends removed, but with no tension applied. In cases of dispute the length shall be measured with the hose under an internal hydrostatic pressure of 10 psi.

6.4 Leaching - Three 10-foot lengths of hose with couplings attached shall be placed in a tank so that water at approximately 15°C can be run both through and over them for 168 hours.

6.5 Cold Flexing - Each of the three 10-foot lengths of hose, which have been leached (par. 6.4) and then dried at room temperature, shall be tightly coiled and placed in a cold box at $-18 \pm 2^\circ\text{C}$ for 24 hours, removed, uncoiled rapidly and immediately recoiled in the reverse direction.

6.6 Soil Burial - Each of the three 10-foot lengths of hose, leached (par. 6.4) and cold flexed (par. 6.5), shall be subjected to burial as follows: Portions to a total length of 4 feet $\pm$ 6 inches of each 10-foot length shall be filled with soil, or flushed with a slurry of soil and water, and buried in the form of at least two loops for 14 days. Conditions of burial shall be in accordance with Method 28.3 of CGSB 4-GP-2.

6.7 Elongation, Twist and Pressure Test - Each 10-foot length of hose, which has been subjected to leaching (par. 6.4), cold flexing (par. 6.5) and soil burial (par. 6.6) and conditioned to equilibrium at 65 ± 2 per cent relative humidity at $70 \pm 2^\circ\text{F}$ ($21.1 \pm 1.1^\circ\text{C}$) shall be connected to a pump capable of developing a steady pressure of 600 psi. After air is bled off, the pressure shall be raised at a rate of 100 psi per minute, pausing 1 minute at 10 psi and 300 psi to allow measurement of the lengths in a straight line between coupling shoulders, and to note the direction of the twist, until 600 psi is reached or the hose fails. If the hose withstands a pressure of 600 psi, this pressure shall be maintained for 5 minutes $\pm$ 10 seconds and the test piece examined for leaks. The pressure shall then be increased to failure. Three 10-foot lengths shall be tested and the following reported:

1. For each length, the pressure at which wet patches or leaks occur if 600 psi or below.
2. For each length, the pressure at burst or at which leakage exceeds pump capacity.
3. The average increase in length of the three lengths expressed as a percentage of the length at 10 psi.

6.8 Heat Resistance - A block of steel 12 x 3 x 3 inches shall be heated to $260 \pm 5^\circ\text{C}$ throughout, and placed crossways on a portion of a length of hose that has been subject to leaching (par. 6.4), cold flexing (par. 6.5), soil burial (par. 6.6) and the pressure test (par. 6.7). The hose shall be at a pressure of 50 ± 10 psi with a flow of 1 gallon per minute. After 2 minutes ± 10 seconds the block shall be removed, the flow stopped and the pressure raised, at 100 psi per minute, to 300 psi and held for 5 minutes. Three specimens, one from each of the lengths tested in par. 6.7, shall be tested; none shall fail at 300 psi.

6.9 Examination for Bonding of Lining - Hose that has been subjected to leaching, cold flexing, soil burial, the pressure test and the heat resistance test shall be cut into lengths of at least 6 inches, and examined visually for bonding of the lining while being flexed manually. Twelve ends taken equally from all the original lengths shall be examined. Not more than one defect shall be permitted where a single separation showing on the two ends resulting from one cut is defined as one defect. Pieces cut from the hose in the area where the hot block was placed shall be discarded.

6.10 Accelerated Aging of Lining - Specimens of natural rubber lining taken from the specimen supplied without couplings shall be oven aged in accordance with ASTM Method D573 at $80 \pm 1^\circ\text{C}$ for 96 hours, and tested for tensile strength and elongation by ASTM Method D412 using die C.

7. NOTES

7.1 CGSB 4-GP-2 may be obtained from the CGSB Secretary.

7.2 B89-1954 may be obtained from the Canadian Standards Association, 235 Montreal Road, Ottawa 2, Canada.

7.3 ASTM test methods may be obtained from the American Society for Testing Materials, 1916 Race Street Philadelphia 3, Pa., U.S.A.

7.4 The aging test for the liner specified in par. 4.9.1 is specifically applicable to natural rubber linings of adequate thickness. Acceptance of other linings is conditional on the presentation of acceptable evidence that their service life is at least equal to the standard defined, for natural rubber of thickness adequate for testing, by par. 4.8.1.

Correspondence regarding this specification should be addressed to the Secretary, Canadian Government Specifications Board, National Research Council, Ottawa 2, Canada.