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R 1401

GENERAL PURPOSE AGRICULTURAL RUBBER SPRAY HOSE

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BRIEF HISTORY

The ISO Recommendation R 1401, *General purpose agricultural rubber spray hose*, was drawn up by Technical Committee ISO/TC 45, *Rubber*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1401, which was circulated to all the ISO Member Bodies for enquiry in December 1967. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	Iran	Spain
Brazil	Ireland	Sweden
Czechoslovakia	Israel	Switzerland
Germany	Italy	U.A.R.
Greece	Japan	United Kingdom
Hungary	Netherlands	U.S.S.R.
India	Poland	Yugoslavia

The following Member Bodies opposed the approval of the Draft :

France
New Zealand
U.S.A.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

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GENERAL PURPOSE RUBBER AGRICULTURAL SPRAY HOSE

INTRODUCTION

This ISO Recommendation has been prepared to provide minimum acceptable requirements for the satisfactory performance of rubber agricultural spray hose for general purposes.

This type of hose is designed for the spraying of insecticides, fungicides, weeding and chemical liquid compounds for use in orchards, parks, forestry, vineyard maintenance and similar agricultural applications. The spraying of these compounds can be performed by two methods, i.e. by a hand pump or by a power driven pump, according to the required delivery and range of the jet, and the nature of the liquid to be sprayed. With the greater delivery values, the higher pressure built up when the nozzle is shut off also needs to be considered. For this reason two types of hose have been considered.

From the point of view of the quality of the hose lining, the nature of the liquid to be sprayed is very important. Two types of liquid have to be considered, i.e. with hydrocarbon base or water base, respectively with or without swelling action on the lining rubber. Consequently, two classes of hoses have been provided for :

(*a*) hydrocarbon fluid resistant lining;

(*b*) non-hydrocarbon fluid resistant lining.

1. SCOPE

This ISO Recommendation specifies the requirements for three types of general purpose agricultural rubber spray hose as follows :

Type A – Light duty : not hydrocarbon fluid resistant – designed for a working pressure of 1.0 MN/m^2 and a proof test pressure of 1.6 MN/m^2.

Type B – Light duty : hydrocarbon fluid resistant – designed for a working pressure of 1.0 MN/m^2 and a proof test pressure of 1.6 MN/m^2.

Type C – Heavy duty : hydrocarbon fluid resistant – designed for a working pressure of 6.3 MN/m^2 and a proof pressure of 12.5 MN/m^2.

NOTE. – A further ISO Recommendation will be introduced to cover other types of hose for more specialized purposes.

2. MATERIALS

The hose should be made with a rubber lining (in types B and C it should be resistant to hydrocarbon fluid), and have a reinforcement of natural or synthetic fibres and a rubber cover.

3. CONSTRUCTION

3.1 The lining and cover should be of uniform thickness, be reasonably concentric, and free from air holes, porosity and other defects.

3.2 The lining should be as smooth in the bore as is consistent with good manufacturing practice.

3.3 The cover of the moulded type hose should be smooth or fluted as required. The cover of mandrel built hose should have a smooth, fluted or cloth wrapped finish.

3.4 The hose should be uniformly vulcanized.

4. DIMENSIONS AND TOLERANCES

4.1 Bore

The bore of the hose should be in accordance with the nominal dimensions and tolerances shown in Table 1.

TABLE 1 – Nominal bore

Dimensions in millimetres

Nominal bore	Tolerance	Nominal bore	Tolerance
5	± 0.50	20	± 0.75
6.3	± 0.75	25	± 1.25
8	± 0.75	31.5	± 1.25
10	± 0.75	40	± 1.50
12.5	± 0.75	50	± 1.50
16	± 0.75		

NOTE. – If special cases call for extra sizes :

(*a*) for smaller or larger dimensions further numbers should be chosen from the R 10 series of preferred numbers with tolerances as given in ISO Recommendation R 1307, *Rubber hose – Bore sizes, test pressures and tolerances on length*;

(*b*) for intermediate dimensions, numbers should be chosen from the R 20 series of preferred numbers, with the tolerances as for the next larger bore size from the R 20 series.

5. PHYSICAL TESTS ON FINISHED HOSE

5.1 Tensile strength and elongation at break of rubber lining and cover

The rubber used for the lining and cover of the hose should, when tested in the manner described in ISO Recommendation R 37,* *Determination of tensile stress-strain properties of vulcanized rubbers*, give a tensile strength and elongation at break not less than the values given in Table 2.

TABLE 2 – **Tensile strength and elongation at break**

	Tensile strength MN/m^2	Elongation at break %
Lining	5.0	200
Cover	7.0	300

5.2 Accelerated ageing test

After ageing for 72 hours at a temperature of 70 °C as described in ISO Recommendation R 188, *Accelerated ageing or simulated service tests on vulcanized natural or synthetic rubbers*, the tensile strength and elongation at break should not vary by more than ± 25 % and + 10 % to −30 % respectively from the initial values.

5.3 Fluid resistance test

The lining of hose types B and C should not, when subjected to the test described in ISO Recommendation R 1817,** *Resistance to liquids of vulcanized natural and synthetic rubber*, change in volume by more than −5 % to + 30 %, after immersion for 48 hours in Liquid B at room temperature.

5.4 Hydrostatic test

The hose, when tested by the method described in ISO Recommendation R 1402, *Hydrostatic testing of rubber hose*, should meet the requirements of Table 3.

TABLE 3 – **Hydrostatic test requirements**

Type	Proof test pressure MN/m^2	Minimum bursting pressure MN/m^2
A	1.6	3.15
B	1.6	3.15
C	12.5	25.0

5.5 Adhesion test

Where suitable test pieces can be prepared (see clause 5.2 of ISO Recommendation R 36) test in accordance with ISO Recommendation R 36,*** *Determination of the adhesion strength of vulcanized rubbers to textile fabrics.*

5.6 Low temperature test

To be included when the test method has been agreed.

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* 2nd Edition – 1968.

** At present Draft ISO Recommendation.

*** 2nd Edition – 1969.

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