



SURFACE VEHICLE STANDARD

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Refrigerant 12 Automotive Air-Conditioning Hose

RATIONALE

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1. Scope

This SAE Standard covers reinforced hose, or hose assemblies, intended for conducting liquid and gaseous dichlorodifluoromethane (refrigerant 12) in automotive air-conditioning systems. The hose shall be designed to minimize permeation of refrigerant 12 and contamination of the system and to be serviceable over a temperature range of -30 to 120°C (-22 to 248°F). Specific construction details are to be agreed upon between user and supplier.¹

NOTE—R12 refrigerant has been placed on a banned substance list due to its ozone depletion characteristics. SAE J51 specification will be phased out as new automotive A/C systems are using R134a. SAE J2064 is the Standard for refrigerant 134a hose. For refrigerant 134a use, refer to SAE J2064.

2. References

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J343 JUN87—Tests and Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies
SAE J2064—R134a Refrigerant Automotive Air-Conditioning Hose

2.1.2 ASTM PUBLICATION

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 380—Methods of Testing Rubber Hose

¹ Tests referenced in this specification are laboratory tests, utilized to establish a performance standard.

3. Manufacture

The following is a list of common constructions and standard sizes of R12 hose, but is not meant to exclude other sizes and constructions.

3.1 Size

Standard dimensions are given in Tables 1A and 1B.

**TABLE 1A—REFRIGERANT 12 AUTOMOTIVE AIR-CONDITIONING HOSE DIMENSIONS⁽¹⁾⁽²⁾⁽³⁾—
INSIDE DIAMETER**

Size mm	Size in	Type A1, A2, B1 Max mm	Type A1, A2, B1 Max in	Type A1, A2, BA Min mm	Type A1, A2, B1 Min in	Type C Max mm	Type C Max in	Type C Min mm	Type C Min in	Type B2, D ⁽⁴⁾ Max mm	Type B2, D ⁽⁴⁾ Max in	Type B2, D ⁽⁴⁾ Min mm	Type B2, D ⁽⁴⁾ Min in
4.8	3/16					5.1	0.202	4.6	0.182	5.4	0.214	4.8	0.188
6.4	1/4	7.0	0.275	6.2	0.245	6.7	0.265	6.1	0.240				
8	5/16	8.6	0.337	7.8	0.307	8.3	0.327	7.6	0.300	8.7	0.343	8.0	0.313
9.5	3/8					9.9	0.390	9.1	0.360				
10	13/32	11.1	0.436	10.2	0.401	10.7	0.423	9.9	0.389	11.1	0.437	10.3	0.406
13	1/2	13.6	0.535	12.4	0.490	13.2	0.520	12.2	0.480	13.7	0.539	12.7	0.500
16	5/8	16.8	0.660	15.6	0.615	16.5	0.650	15.2	0.600	16.9	0.667	15.9	0.625
22	7/8									23.3	0.917	22.2	0.825
29	1-1/8									29.8	1.172	28.6	1.125

- Fitting compatibility—fittings for thermoplastic hose may not necessarily be interchangeable. Therefore, it is recommended that fittings for hose be properly matched. Fittings and/or hose manufacturers' recommendations should be followed.
- Concentricity based on total indicator reading between inside bore of hose and outer surface of hose shall not exceed the following values:
 - Types A1, A2, B1, B2, and D:
 - Sizes 6.4 mm (1/4 in) and under 0.8 mm (0.030 in)
 - Sizes over 6.4 mm to 22 mm (1/4 to 7/8 in) 1.0 mm (0.040 in)
 - Sizes over 22 mm (7/8 in) 1.3 mm (0.050 in)
 - Type C
 - Sizes 6.4 mm (1/4 in) and under 0.5 mm (0.020 in)
 - Sizes over 6.4 mm to 13 mm (1/4 to 1/2 in) 0.6 mm (0.025 in)
 - Sizes over 13 mm (1/2 in) 0.8 mm (0.030 in)
- These are common hose sizes, but are not meant to exclude other sizes.
- Dimensions for 3/16 in size apply only to Type B2 hose.

TABLE 1B—REFRIGERANT 12 AUTOMOTIVE AIR-CONDITIONING HOSE DIMENSIONS⁽¹⁾⁽²⁾—OUTSIDE DIAMETER

Size mm	Size in	Type A1 Max mm	Type A1 Max in	Type A1 Min mm	Type A1 Min in	Type A2 Max mm	Type A2 Max in	Type A2 Min mm	Type A2 Min in	Type B1 Max mm	Type B1 Max in	Type B1 Min mm	Type B1 Min in	Type C ⁽²⁾ Max mm	Type C ⁽²⁾ Max in	Type B2, D ⁽³⁾ Max mm	Type B2, D ⁽³⁾ Max in	Type B2, D ⁽³⁾ Min mm	Type B2, D ⁽³⁾ Min in
4.8	3/16													8.3	0.328	13.7	0.539	12.7	0.500
6.4	1/4	15.1	0.594	13.5	0.532					16.5	0.648	15.3	0.602	11.4	0.450				
8	5/16	19.1	0.750	17.5	0.688	19.8	0.781	18.3	0.719	18.8	0.742	17.7	0.696	13.5	0.530	17.6	0.695	16.7	0.656
9.5	3/8													15.2	0.600				
10	13/32	23.0	0.906	21.4	0.844	23.8	0.937	22.2	0.875	21.2	0.835	20.0	0.789	16.1	0.635	20.0	0.789	18.9	0.743
13	1/2	25.4	1.000	23.8	0.937	26.2	1.031	24.6	0.969	23.8	0.937	22.2	0.875	18.8	0.740	24.0	0.945	22.8	0.899
16	5/8	28.5	1.124	27.8	1.062	29.4	1.156	27.8	1.094	27.0	1.062	25.4	1.080	23.4	0.920	28.0	1.101	26.8	1.055
22	7/8															32.2	1.266	30.6	1.203
29	1-1/8															38.9	1.531	37.3	1.469

- Fitting compatibility—fittings for thermoplastic hose may not necessarily be interchangeable. Therefore, it is recommended that fittings for hose be properly matched. Fittings and/or hose manufacturers' recommendations should be followed.
- Concentricity based on total indicator reading between inside bore of hose and outer surface of hose shall not exceed the following values:
 - Types A1, A2, B1, B2, and D:
 - Sizes 6.4 mm (1/4 in) and under 0.8 mm (0.030 in)
 - Sizes over 6.4 mm to 22 mm (1/4 to 7/8 in) 1.0 mm (0.040 in)
 - Sizes over 22 mm (7/8 in) 1.3 mm (0.050 in)
 - Type C
 - Sizes 6.4 mm (1/4 in) and under 0.5 mm (0.020 in)
 - Sizes over 6.4 mm to 13 mm (1/4 to 1/2 in) 0.6 mm (0.025 in)
 - Sizes over 13 mm (1/2 in) 0.8 mm (0.030 in)
- Dimensions for 3/16 in size apply only to Type B2 hose.

3.2 Type A1 and A2—Rubber, Textile Reinforced

The hose shall be built having a seamless oil-resistant synthetic rubber tube. The reinforcement shall consist of textile yarn, cord, or fabric adhered to the tube and cover. The outer cover shall be heat and ozone-resistant synthetic rubber. It is recommended that the cover be pinpricked.

NOTE—Commercial product normally offered for Type A1 hose has been a one braid reinforcement of textile yarn with a smaller OD than Type A2 hoses. Type A2 hose has been a two braid hose. Hose fittings for Type A1 and A2 hoses are not normally interchangeable.

3.3 Type B1 and B2—Rubber, Wire Reinforced

The hose shall be built having a seamless oil-resistant synthetic rubber tube. The reinforcement shall consist of steel wire adhered to the rubber tube. The cover shall consist of a heat-resistant textile yarn impregnated with a synthetic rubber cement.