SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1942 | REV. JUN93

Issued 1989-03-24
Revised 1993-06-28

Submitted for recognition as an American National Standard

Superseding J1942 MAY92

HOSE AND HOSE ASSEMBLIES FOR MARINE APPLICATIONS

1. *Scope*—SAE J1942, developed through the cooperative efforts of the U.S. Coast Guard and SAE, became effective August 28, 1991[1], as the official document for nonmetallic flexible hose assemblies for marine use.

This SAE Standard covers specific requirements for several styles of hose and/or hose assemblies in systems on board commercial vessels inspected and certificated by the U.S. Coast Guard. It is intended that this document establish hose constructions and performance levels that are essential to safe operations in the marine environment. Refer to SAE J1273 for selection, installation, and maintenance of hose and hose assemblies.

(R) A Hose Assemblies Listing of the products which can be used for the applications described in Table 1 is available from SAE as SAE J1942/1.

2. *References*

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

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

SAE J343—Test and Procedures for SAE 100 R Series Hydraulic Hose and Hose Assemblies
SAE J517—Hydraulic Hose
SAE J1273—Selection, Installation, and Maintenance of Hose and Hose Assemblies
SAE J1475—Hydraulic Hose Fittings for Marine Applications
SAE J1942/1—SAE Marine Hose Assemblies List

2.1.2 ASTM PUBLICATIONS—Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 1141-52—Specification for Substitute Ocean Water

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[1] Ref: Federal Register/Vol. 56, No. 145/Monday, July 29, 1991/Rules and Regulations

Printed in U.S.A.
90-1202B EG

2.1.3 MSHA PUBLICATIONS

MSHA 30 CFR 18.65—Conservation of Power and Water Resources—Subchapter B—Regulations Under the Federal Power Act

3. ***Hose Application/Construction***—Hose construction and performance shall conform to Table 1.

TABLE 1—HOSE APPLICATION/CONSTRUCTION

Code	Application	Maximum Service Pressure	Hose Reinforcement/ Construction	Requirements	Notes
HF	All Services	[1] [3]	Plies or braids of steel wire with or without textile [2]	Sections 6, 7, 8, 9, 10, 11 (SAE J517 may be substituted for Section 9)	Acceptable for Codes H, VW NVW, and F applications [3]
H	Fluid Power (Hydraulic Systems)	[1]	Plies or braids of steel wire or textile [2]	Sections 6, 7 9, 10, 11 (SAE J517 may be substituted for Section 9)	Acceptable for Codes H, VW, and NVW applications
F	Lube Oil and Fuel Systems	[1]	Plies or braids of steel wire with or without textile [2]	Sections 6, 7, 8, 9 (impulse per 9E not required) 10, 11	Acceptable for Codes F, VW, and NVW applications
VW	Vital and Nonvital Fresh and Salt Water	[1]	Plies or braids of steel wire or textile [2]	Sections 6, 7, 10, 11	Acceptable for Codes VW and NVW applications
NVW	Nonvital Water and Pneumatic	0.34 MPa	Optional	Sections 6, 7, 10, 11	Acceptable for Code NVW application only

[1] As rated by SAE J517 or as rated by manufacturer.
[2] Wire helix construction may be used on suction and return lines in conjunction with a textile reinforcement.
[3] Maximum service pressure for lube oil and fuel systems applications (Code F) may be less than maximum service pressure for other systems applications, e.g., Code H. Refer to manufacturer's catalog and Hose Assemblies List, SAE J1942/1.

4. ***Fittings***—Fittings shall conform to SAE J1475 where applicable; only hose and fitting combinations that have been tested and passed the requirements of this document as hose assemblies are acceptable. Push-on fittings, quick disconnect couplings, and fittings with a single worm-gear clamp or a single band around the hose, are unacceptable.

5. ***Qualification Tests***—For qualification to this document, hose and/or assemblies made therefrom shall conform to the tests and requirements specified in Table 1 for each hose application.

Testing shall conform to SAE J343 except as noted.

(R) Manufacturers may have their hose assemblies listed in SAE J1942/1 by submitting a statement to SAE certifying that all the applicable requirements in SAE J1942 are met for their specific hose assemblies. The certification shall also include such information as the make and model of the hose assembly, maximum allowable working pressure for the particular application(s), whether a fire sleeve is required, etc., in order that the hose assembly will be accurately listed in SAE J1942/1.

6. ***Immersion-Burst Test***—One 450 mm assembly, uncapped, shall be completely immersed in a nonpressurized, closed container filled with synthetic sea water conforming to ASTM D 1141-52 for 48 h ± 1 h at 70 °C ± 1 °C. The assembly shall then be removed and held for 48 h ± 1 h in air at room temperature 21 °C ± 2.5 °C. Following this aging, the assembly shall be subjected to the burst test specified in SAE J343.

   Burst shall not occur at a pressure less than four times the rated operating pressure. Within 1/2 h following the burst test, the hose shall be cut apart and the reinforcement examined for signs of corrosion and/or deterioration. The wire of wire-reinforced hose shall not show red rust.

7. ***Flame Resistance***—The hose cover shall pass the MSHA (Mine Safety Health Administration) flame resistance requirements of 30 CFR 18.65. In lieu of testing the hose cover, it may be protected by a fire sleeve of suitable material that conforms to the flame resistance criteria of 30 CFR 18.65.

8. ***2-1/2 Min Fire Test***—For hose 51 mm inside diameter and smaller, three assemblies are to be consecutively tested for fire resistance. For hoses larger than 51 mm inside diameter, one hose assembly shall be tested. Free hose length measured between the fittings shall be 400 to 600 mm. At least one end fitting shall be positioned to be engulfed in the flame. The hose shall be positioned 230 mm above the top edge of an open pan the size of 215 x 355 x 13 mm. Sufficient heptane shall be added to the pan to provide for a 2-1/2 min burn.

   Thermocouples shall be mounted so as to sense the flame temperature in the same plane and elevation as the hose assembly. The assembly shall be pressurized with water to the maximum operating pressure and maintained during the burning portion of the test. Following ignition of the heptane, timing shall begin and the temperature shall be monitored. The temperature shall reach a minimum of 650 °C but shall not exceed 730 °C. (If 650 °C is not reached, the test must be repeated with a new sample. If 730 °C is exceeded, results may be discarded and the test repeated.)

   At the end of 2-1/2 min of fire exposure, the flame shall be extinguished and pressure relieved. Water from a 915 mm shall flow through the assembly. Failure to achieve free flow shall constitute failure. With free flow established, the assembly shall be pressurized to the maximum operating pressure for 30 s. Leakage during the fire exposure or subsequent pressure test shall constitute failure. Reference Figures 1 and 2 for fire test set-up and test chamber. (NOTE—Hose assemblies may use protective fire sleeves.)

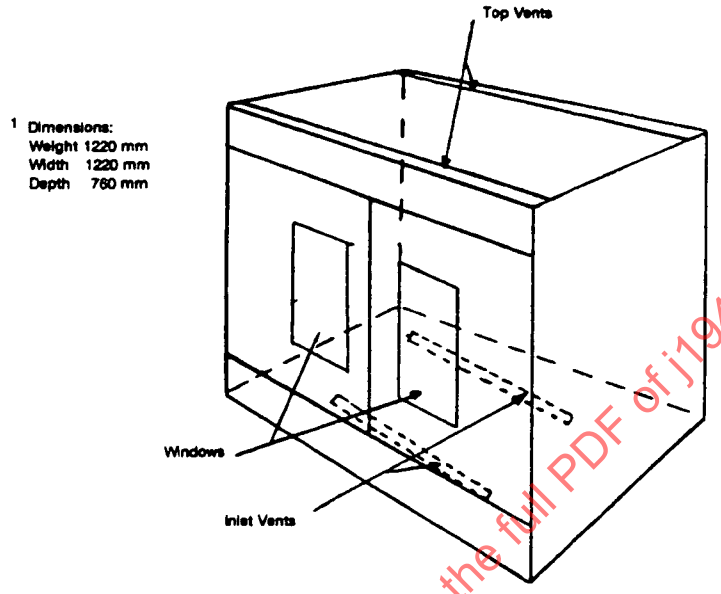
9. ***Non-SAE J517 Hose/Hose Assemblies***—Products not conforming to SAE J517 shall meet the following:

   a. Proof test per SAE J343, no leakage allowed.
   b. Change in length per SAE J343, not to exceed +2 and -4% (does not apply to wire helix type hose).
   c. Burst test per SAE J343, minimum burst shall be at least four times the rated operating pressure.
   d. Cold bend test per SAE J343, no cracking or leakage allowed. Testing to be done at the manufacturer's minimum recommended temperature.
   e. Impulse test per SAE J343. Conduct test at 125% of operating pressure for 200 000 cycles at a fluid temperature of 100 °C. No leakage or other malfunction is allowed. (Impulse not required on wire helix type hose.)

10. ***Inspection Tests***—The tests required in Table 1 shall be repeated at least every 3 years except for the 2-1/2 min fire test (Section 8) which does not need to be rerun unless there is a change in the construction or material of the listed hose.

All test results shall be maintained on file, for review, for a period of 6 years; except that test results of the 2-1/2 min fire test shall be maintained for at least 5 years after termination of hose production.

Test reports may be requested for inspection, at any time, by the U.S. Coast Guard.



[1] Dimensions may vary slightly provided that all other test parameters in Section 8 are met.

FIGURE 1—FIRE TEST CABINET

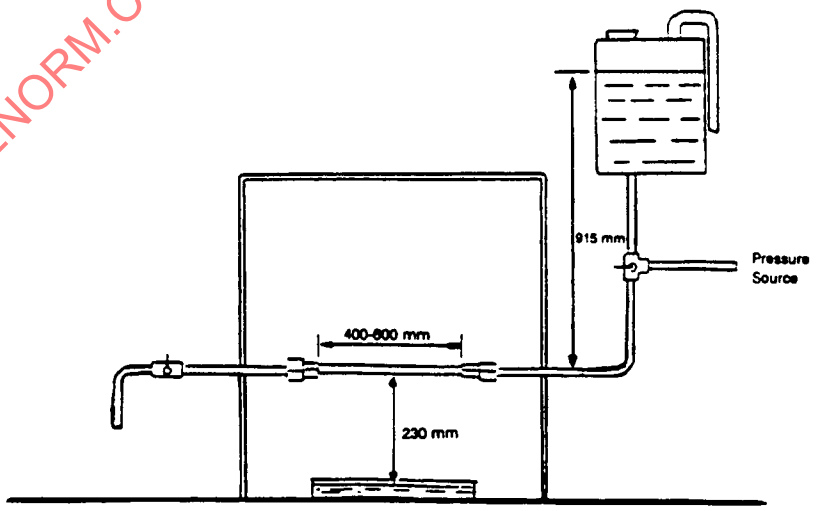


FIGURE 2—TEST SET-UP