



Care and Maintenance of Hose (Reprinted From RMA Hose Handbook)

Hose has a limited life and the user must be alert to signs of impending failure, particularly when the conditions of service include high working pressures and/or the conveyance or containment of hazardous materials. The periodic inspection and testing procedures described here provide a schedule of specific measures which constitute a minimum level of user action to detect signs indicating hose deterioration or loss of performance before conditions leading to malfunction or failure are reached.

SAFETY WARNING: Failure to follow properly the manufacturer's recommended procedures for the care, maintenance and storage of a particular hose might result in its failure to perform in the manner intended and might result in possible damage to property and serious bodily injury.

General instructions are also described for the proper storage of hose to minimize deterioration from exposure to elements or environments which are known to be deleterious to rubber products. Proper storage conditions can enhance and extend substantially the ultimate life of hose products.

General Care and Maintenance of Hose

Hose should not be subjected to any form of abuse in service. It should be handled with reasonable care. Hose should not be dragged over sharp or abrasive surfaces unless specifically designed for such service. Care should be taken to protect hose from severe end loads for which the hose or hose assembly were not designed. Hose should be used at or below its rated working pressure; any changes in pressure should be made gradually so as to not subject the hose to excessive surge pressures. Hose should not be kinked or be run over by equipment. In handling large size hose, dollies should be used whenever possible; slings or handling rigs, properly placed, should be used to support heavy hose used in oil suction and discharge service.

General Test and Inspection Procedures for Hose

An inspection and hydrostatic test should be made at periodic intervals to determine if a hose is suitable for continued service.

A visual inspection of the hose should be made for loose covers, kinks, bulges or soft spot which might indicate broken or displaced reinforcement. The couplings or fittings should be closely examined and, if there is any sign of movement of the hose from the couplings, the hose should be removed from service.

The periodic inspection should include a hydrostatic test for one minute at 150% of the recommended working pressure of the hose. An exception to this would be woven jacketed fire hose.* During the hydrostatic test, the hose should be straight, not coiled or in a kinked position.

Water is the usual test medium and, following the test, the hose may be flushed with alcohol to remove traces of moisture. A regular schedule for testing should be followed and inspection records maintained.

SAFETY WARNING: Before conducting any pressure tests on hose, provision must be made to ensure the safety of the personnel performing the tests and to prevent any possible damage to property. Only trained personnel using proper tools and procedures should conduct any pressure tests.

*Woven jacket fire hose should be tested in accordance with the service test provisions contained in the current edition of National Fire Protection Bulletin No.1962 -- Standard for the Care, Use and Service Testing of Fire Hose.

1. Air or any other compressible gas must never be used as the test media because of the explosive action of the hose should a failure occur. Such a failure might result in possible damage to property and serious bodily injury.

2. Air should be removed from the hose by bleeding it through an outlet valve while the hose is being filled with the test medium.

3. Hose to be pressure tested must be restrained by placing steel rods or straps close to each end and at approximate 10 foot (3 m) intervals along its length to keep the hose from "whipping" if failure occurs. The steel rods or straps are to be anchored firmly to the test structure but in such a manner that they do not contact the hose which must be free to move.

4. The outlet end of hose is to be bulwarked so that a blown-out fitting will be stopped.

5. Provisions must be made to protect testing personnel from the forces of the pressure media if a failure occurs.

6. Testing personnel must never stand in front of or in back of the ends of a hose being pressure tested.

7. When liquids such as gasoline, oil, solvent, or other hazardous fluids are used as the test fluid, precautions must be taken to protect against fire or other damage should a hose assembly fail and the test liquid be sprayed over the surrounding area.

The Rubber Manufacturers Association has published separately a series of Hose Technical information bulletins describing hoses designed for different applications which detail Maintenance, Testing and Inspection recommendations. Reference should be made to the current RMA Catalog of Publications to determine the availability of the latest edition. Bulletins published as of January 2003 include the following:

Publication No.

- IP 11—1—Steam Hose
- IP 11—2—Anhydrous Ammonia Hose
- IP 11—4—Oil Suction and Discharge Hose
- IP 11—5—Welding Hose
- IP 11—7—Chemical Hose
- IP 11—8—Fuel Dispensing Hose

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Hose Cleaning

There are many different methods used to clean hose assemblies. An apron, safety glasses or face shield, rubber boots and gloves should be worn to help protect the person doing the cleaning from potential injury. Some suggested methods for select hoses in this catalog are listed below. Which method to use and how often cleaning should be performed is based on the following:

- Type of hose
- Residual material in the hose
- Cleanliness requirements for the application
- Cleaning facilities available
- Consideration for disposal of the residual material and cleaning solutions(s)
- Requirements for special applications such as foods, pharmaceuticals, etc.

Solution Recommendations

1. Cleaning solutions should be chosen that will dissolve or remove the residual material without damaging the hose assembly.
2. A dilute solution of soap in water can often be sufficient. CAUTION – Some chemicals, such as concentrated acids or bases, can react with water releasing heat and byproducts, and possibly splatter.
3. Consult the MSDS of the material being cleaned to identify potential cleaning solutions.
4. After identifying potential cleaning solutions, check the Chemical Resistance Table in this catalog for compatibility with the hose tube and cover.
5. Non-compatibility of a cleaning solution can cause damage to the hose.

Flushing or Immersing in a Cleaning Bath

1. **Do not exceed the maximum working pressure or temperature for the hose.**
2. The cover of the hose should also be washed or wiped to remove any residual material.

Steam Cleaning

1. **Steam cleaning is not generally recommended.** High temperatures can accelerate aging of a hose and shorten service life.
2. **Do not exceed the maximum temperature rating of the hose.** Doing so can cause defects such as tube delamination (reducing tube to reinforcement adhesion), tube cracking or tube flow leaving thin spots.
3. **Never use superheated steam!** This will exaggerate the potential damages noted above. Only “open end” 50 psi steam should be used.
4. If the hose has blockage, remove it before introducing steam.
5. If the steam source has a wand attached, use caution inserting the wand so that physical damage to the hose is not caused. Sharp edges on the wand can cut the tube, and thin spots could occur where the hot wand contacts the tube.

Shuttle Method

1. **This is not a recommended cleaning method for hose assemblies.**
2. This method uses a shuttle to travel through the inside of the hose assembly to wipe residual material from the hose. The shuttle and residual material can come out of the hose at velocities that could cause injuries or damage.
3. There is also danger from a build up of pressure if the shuttle becomes lodged.
4. The shuttle can cause damage to the hose tube.

Recommended Cleaning of Chemical Hose

1. Drain the hose after each use.
2. Flush with water or other neutralizing cleaning solution.
3. Properly dispose of drained fluid and cleaning waste.
4. Between uses, store the hose in a clean, dry environment away from sunlight.
5. **Avoid cross contamination.** Dedicate a hose to handle a specific chemical.

Recommended Cleaning of Food Hose

1. Drain the hose after each use.
2. Flush with water or other cleaning solution.
3. Properly dispose of drained material and cleaning waste.
4. Between uses, store the hose in a clean, dry environment away from sunlight.
5. **Avoid cross contamination.** Dedicate a hose to handle a specific food material.



Storage

Rubber hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents and radioactive materials.

The appropriate method for storing hose depends to a great extent on its size (diameter and length), the quantity to be stored and the way in which it is packaged. Hose should not be piled or stacked to such an extent that the weight of the stack creates distortions on the length stored at the bottom.

Since hose products vary considerably in size, weight and length, it is not practical to establish definite recommendations on this point. Hose having a very light wall will not support as much load as could a hose having a heavier wall or hose having a wire reinforcement. Hose which is shipped in coils or bales should be stored so that the coils are in a horizontal plane.

Whenever feasible, rubber hose products should be stored in their original shipping containers, especially when such containers are wooden crates or cardboard cartons which provide some protection against the deteriorating effects of oils, solvents and corrosive liquids; shipping containers also afford some protection against ozone and sunlight.

Certain rodents and insects will damage rubber hose products and adequate protection from them should be provided.

Cotton jacketed hose should be protected against fungal growths if the hose is to be stored for prolonged periods in humid conditions in excess of 70%.

The ideal temperature for the storage of rubber products ranges for 50° to 70°F (10-21°C) with a maximum limit of 100°F (38°C). If stored below 32°F (0°C), some rubber products become stiff and would require warming before being placed in service. Rubber products should not be stored near sources of heat, such as radiators, base heaters, etc., nor should they be stored under conditions of high or low humidity.

To avoid the adverse effects of high ozone concentration, rubber hose products should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas of known high ozone concentration. Hose should not be stored in locations where the ozone level exceeds the National Institute of Occupational Safety and Health's upper limits of 0.10 ppm. Exposure to direct or reflected sunlight – even through windows – should also be avoided. Uncovered hose should not be stored under fluorescent or mercury lamps which generate light waves harmful to rubber.

Storage areas should be relatively cool and dark, and free of dampness and mildew. Items should be stored on a first-in, first-out basis, since even under the best of conditions, an unusually long shelf life could deteriorate certain rubber products.

Decimal and Millimeter Equivalents of Fractions

Inches		Decimals	Millimeters
Fractions			
1/64		.015625	.397
	1/32	.03125	.794
3/64		.046875	1.191
	1/16	.0625	1.588
5/64		.078125	1.984
	3/32	.09375	2.381
7/64		.109375	2.778
	1/8	.125	3.175
9/64		.140625	3.572
	5/32	.15625	3.969
11/64		.171875	4.366
	3/16	.1875	4.763
13/64		.203125	5.159
	7/32	.21875	5.556
15/64		.234375	5.953
	1/4	.250	6.350
17/64		.265625	6.747
	9/32	.28125	7.144
19/64		.296875	7.541
	5/16	.3125	7.938
21/64		.328125	8.334
	11/32	.34375	8.731
23/64		.359375	9.128
	3/8	.375	9.525
25/64		.390625	9.922
	13/32	.40625	10.319
27/64		.421875	10.716
	7/16	.4375	11.113
29/64		.453125	11.509
	15/32	.46875	11.906
31/64		.484375	12.303
	1/2	.500	12.700

Inches		Decimals	Millimeters
Fractions			
33/64		.515625	13.097
	17/32	.53125	13.494
35/64		.546875	13.891
	9/16	.5625	14.288
37/64		.578125	14.684
	19/32	.59375	15.081
39/64		.609375	15.478
	5/8	.625	15.875
41/64		.640625	16.272
	21/32	.65625	16.669
43/64		.671875	17.066
	11/16	.6875	17.463
45/64		.703125	17.859
	23/32	.71875	18.256
47/64		.734375	18.653
	3/4	.750	19.050
49/64		.765625	19.447
	25/32	.78125	19.844
51/64		.796875	20.241
	13/16	.8125	20.638
53/64		.828125	21.034
	27/32	.84375	21.431
55/64		.859375	21.828
	7/8	.875	22.225
57/64		.890625	22.622
	29/32	.90625	23.019
59/64		.921875	23.416
	15/16	.9375	23.813
61/64		.953125	24.209
	31/32	.96875	24.606
63/64		.984375	25.003
	1	1.000	25.400

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