Thermoid®

Made in U.S.A.

AUTOMOTIVE AFTERMARKET HOSE CATALOG

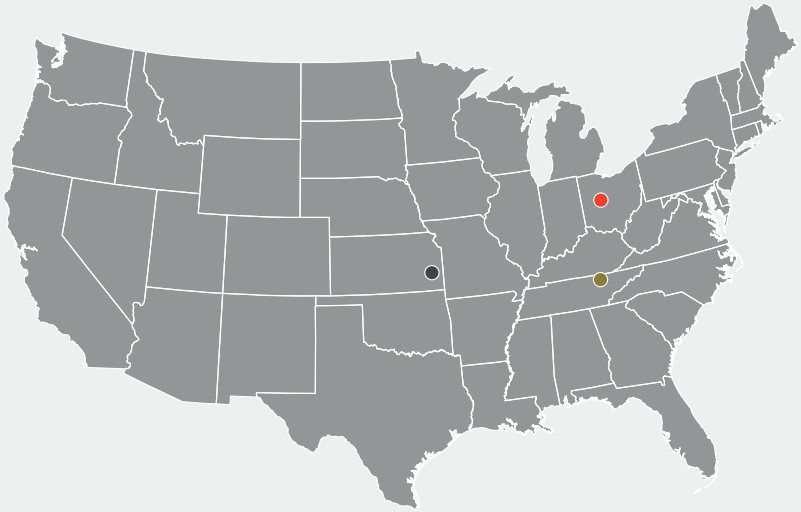
ABOUT THERMOID

Thermoid has manufactured quality rubber products since 1883, delivering innovative solutions for the most challenging environments. Thermoid serves many diverse industries and markets and works with customers to source both standard and custom-designed products, ranging from multipurpose industrial hoses to conveyor belting. End users, OEMs and industrial distributors worldwide choose Thermoid products for their reliability, quality construction, durability and exceptional performance.

MANUFACTURING EXCELLENCE & SAFETY

Thermoid products are made in environmentally safe manufacturing facilities that operate under the guidance of ISO 9001 Quality Systems. A strong commitment to maintaining and improving the quality of product performance and customer service is inherent within our management policy and extends to every member of the company.

Thermoid provides innovative rubber products across a variety of markets. Our vision is to build lasting customer relationships and solutions to customers' most challenging problems. Thermoid products are manufactured in the U.S. at three facilities.



Bellefontaine, OH
Hoses

Chanute, KS
Ducting

Oneida, TN
Hoses, Lightweight Conveyor Belting

Made in U.S.A.

INDEX

GENERAL HOSE INFORMATION

Thermoid is a leader in developing innovative hose product designs and manufacturing production techniques. Our production expertise provides customers with hose products that they can rely on to stand up to the roughest types of industrial and/or working environments.

THERMOID® BRAND ADVANTAGE

Thermoid uses two manufacturing processes Concure® and Thermocure to produce durable, top-quality hose products with value-added features.

Concure®

The Concure® continuous manufacturing process was invented, developed and patented by Thermoid and helps us produce the finest hose products possible. Our Concure process assures dimensional stability from end to end, provides a contamination-free and smooth hose tube in long, unbroken lengths. Benefits from Flex Strength® hose products include:

Long Length Reels: More than 80% of our reels contain one length of hose, no three-piece reels, giving you a 15-20% savings due to less scrap.

Product Flexibility/Kink Resistance: Our spiral hose construction offers improved hose flexibility, easy handling on the job and provides increased resistance to kinking.

Uncontaminated Tube: Flex Strength hose is cured with an air mandrel assuring a clean, smooth tube. No dirt or other contaminants to clog nozzles or damage air tools.

Pin-Pricked Covers: Most Flex Strength hose products have a pin-pricked cover.

Wider Working Pressure Range/More Hose Grades: Flex Strength hose is available with pressure ratings from 150 to 300 psi working pressure, assuring you have the right hose for the job. Our wide variety of products allows you to find the correct hose for every application.

Convenience Branding: Our industrial hose products are branded with size, working pressure and type. Private branding is available.

Thermocure

Thermoid uses Thermocure, its patented manufacturing process, to provide consistent I.D. and O.D., to make the hose easier to couple, and to help its smooth cover provide added durability when dragging over rough surfaces. With this process, Thermoid has become a potent force in the Fuel Oil Delivery and LP Gas markets with the Thermoid FOD hose and the Type 75 LP Gas hose. The Thermocure process gives these first-class products, a showroom quality look.

S.T.A.M.P.E.D.

The acronym "STAMPED" helps with the proper selection of hose to reduce the chance of a failure from a misapplication. Serious damage and/or injury may occur if a hose or fitting is used in an application other than what it is designed for. This information can help increase the useful life of the hose and greatly reduce the chance of a problem.

S SIZE: I.D., O.D. and length.

T TEMPERATURE of the material conveyed and environmental.

A APPLICATION, the conditions of use.

M MATERIAL being conveyed, type and concentration.

P PRESSURE to which the assembly will be exposed.

E ENDS: style, type, orientation, attachment methods, etc.

D DELIVERY: testing, quality, packaging, and delivery requirements.

TECHNICAL INFORMATION

ARPM OIL RESISTANCE DATA

The effects of oil on rubber depend on a number of factors that include the type of rubber compound, the composition of the oil, the temperature and time of exposure. Rubber compounds can be classified as to their degree of oil resistance based on their physical properties after exposure to a standard test fluid. In this ARPM classification, the rubber samples are immersed in IRM 903 oil at 100°C (212°F) for 70 hours (see ASTM Method D 471 for a detailed description of the oil and the testing procedure). As a guide to the user of hose in contact with oil, the oil resistance classes and a corresponding description are listed in the table to the right.

Physical Properties after Exposure to Oil		
Oil Resistance Class	Maximum Volume Change	Tensile Strength Retained
Class A (High oil resistance)	+25%	80%
Class B (Medium oil resistance)	+65%	50%
Class C (Limited oil resistance)	+100%	40%

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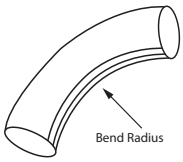
HOSE RESISTANCE CHARACTERISTICS REFERENCE

Thermoid has developed a quick reference system for identifying hose resistance characteristics within certain environmental conditions and physical properties. The chart below lists a number of specific conditions, each of which has been assigned a specific symbol to represent it. These symbols will be displayed for each hose product in this catalog to identify the various long-term, environmental resistance levels of that product.

For complete information on hose resistance characteristics and service performance in specific applications and/or environments, please consult your area Thermoid sales representative and review the product specification information and Chemical Resistance Tables listed on our website at www.thermoid.com.

Environmental/ Physical Property	Symbol	Environmental/ Physical Property	Symbol	Environmental/ Physical Property	Symbol
Abrasion		Heat		Ozone	
Aging		Kinking		Weathering	
Coolant		Oil			

Minimum Hose Bend Radius Data (MBR)



The Bend Radius is the radius of the bent section of a hose measured to the innermost surface of the curved portion. It is important because the minimum bend radius is the maximum amount a hose can be bent without being kinked or damaged.

General formula to determine bend length:

$$\frac{\text{Angle of Bend}}{360^\circ} \times 2\pi r = \text{minimum length of hose to make bend}$$

r = given bend radius of hose

Example: to make a 90° bend with a hose with a 2" I.D.

$$\text{Given } r = 4.5 \text{ inches} \quad \frac{90^\circ}{360^\circ} \quad [\,2 \times 3.14 \times 4.5\,]$$

$.25 \times 2 \times 3.14 \times 4.5 = 7''$ (inches)

7 inches is the minimum length the hose can be bent without damaging it. Remember that the bend should take place over the entire minimum length and not a portion of it. In addition, the formula does not mean that 7 inches will be long enough to meet application needs. It only means that if the 90° bend takes place in less than 7 inches, the hose could be damaged.

⚠ WARNING

BASIC SAFETY CONSIDERATIONS & WARNINGS

The user is responsible for ensuring that the correct hose and couplings are selected to meet the requirements of the application and that all safety precautions are followed. Failure to exercise proper safety precautions may result in serious bodily injury, death, property damage or other loss **from hazardous chemicals, elevated temperature materials, explosive or flammable materials, sparking or static electricity, contamination of material conveyed, impelled couplings, whipping hose, and high pressure or high velocity discharge of materials**.

Users should review information provided by Thermoid in its product catalogs and on the Thermoid website **(www.thermoid.com)** and contact a Thermoid marketing or technical representative if further information is needed.

1. All hose has a limited life for a given application and is subject to fail without warning: This is true even if the proper hose has been selected for the application; it is used within rated pressures, temperatures and environmental conditions; and it is properly inspected and maintained. This is because the elastomers and reinforcement used to construct the hose will break down over time and with use. This process is accelerated if the hose is used in severe applications or is subject to abuse. The user should conduct testing and other analysis to determine the service life of the hose assembly in a given application. Keep in mind, however, that even with extensive testing and analysis, it is not always possible to accurately determine the service life of a hose due to the number of variables involved in any given application. Regularly inspect and replace hose assemblies.

2. Critical Applications: Careful consideration is required when using hose instead of hard piping in any application where failure could cause bodily injury, property damage or other loss. If hose is used, the user is responsible for determining the service life and implementing adequate safety measures including:

- **Regular Inspections and Replacement.** Hose assemblies used in such applications should be inspected at frequent intervals based on the seriousness of the risk. These inspections should include: tube and cover examinations for hardening, brittleness, abrasions, kinks, twisting, crushed areas, cracks, cuts, leaking, blisters, peeling or soft cover, braid exposure and other evidence of damage or deterioration; seepage, leaking, slipped or damaged couplings; and proof testing. Damaged or suspect hose and fittings should be immediately replaced. Hose assemblies should also be replaced at regular intervals, well in advance of the expected service life of the hose.
- **Personal Protective Equipment and Other Safeguards.** Always use proper protective equipment (for example, gloves, eye protection, protective suits, hardhats, etc.) that will protect the user in the event of hose failure or other accident. Systems should be designed, hose lines should be routed and safeguards put in place so that if a failure does occur, damage and injury persons or property will be avoided.
- **Operator Training.** All operators must be thoroughly trained in the proper care and use of hoses, the hazards of any material conveyed, and accidental release response measures.

3. External Abuse: Kinking, bending, high end pull, crushing, abrasion, exceeding the recommended minimum bend radius, exceeding the rated working pressure, exposure to chemicals, exposure to temperature extremes, and other abuse or damage will reduce the service life and performance of the hose. This may be the case even though the hose may appear to be undamaged from exterior appearance. Hoses should not be stretched, run over by equipment, or used to hoist, carry or pull objects. Hoses should not be bent beyond recommended minimum bend radius. This could result in kinks which could increase pressure and cause damage that could reduce pressure resistance. Larger or more heavily loaded hoses may require additional support to reduce stretching, kinking and external abuse.

4. System Pressures: Never use hose at pressures that exceed its working pressure ratings. A system (or device or application) can have varied pressures caused by source, operator action or mechanical components. It is the responsibility of the user to accurately determine the maximum system pressure and to eliminate any system pressures that exceed the lowest rated working pressure of any of the system components. Steady state pressure can be measured readily by gauges. Surge and hammer effect pressures are often momentary and may require the use of electronic pressure sensing devices to detect and measure. A "hammer effect" is a pressure spike that results from a sudden blockage or stoppage of the system. Hammer effects can damage or even cause catastrophic failure of the hose or system.

Note: The burst value is **NOT** the maximum working pressure for a hose. Burst values are used as one factor in the establishment of a reasonable and safe maximum working pressure. **MAXIMUM WORKING PRESSURE IS ONE OF THE ESSENTIAL OPERATING CHARACTERISTICS THAT A HOSE USER MUST KNOW AND RESPECT TO ASSURE SAFE SERVICE AND OPTIMUM LIFE.** Do not exceed maximum rated working pressure even if the burst value is higher.

5. Suction Applications: Not all hose is suitable for suction applications as vacuum pressures may cause the hose to collapse. Be sure to select a hose that is rated for suction or vacuum applications.

6. Temperatures: Never use hose at temperatures that exceed or are below its ratings. **High temperatures can degrade a hose very quickly**, resulting in shortened service life. For example, radiant heat from hot manifolds, heat shields and molten materials can bake rubber hose making it brittle. Low temperatures cause the hose to crack or break. The allowable temperature ranges are shown on the product catalog pages. These are for **internal product temperatures** and assume external or ambient temperatures are within the same temperature ranges. If external temperatures are higher or lower than these ranges, contact your Thermoid Customer Service Representative for alternative recommendations. **Fluid and environmental temperatures that are high or low, but within the working temperature range, will still shorten hose life.**

7. Misapplication: Thermoid designs and supplies a variety of hoses. The user is responsible for selecting the correct hose for the application and ensuring that the hose cover, tube, reinforcement and fittings are compatible with the material conveyed and the conditions to which the hose assembly will be exposed. If a hose is incorrectly selected for an application and/or misapplied, the hose will likely fail regardless of the care and/or maintenance provided.

- **Chemical Compatibility Chart.** Consult the Thermoid Chemical Resistance Chart for information on the suitability of various tube and cover compounds for use conveying or when exposed to various chemicals and substances.
- **Temperature Compatibility.** Consult the hose product pages for information on the temperature ranges for various hose types.
- **Other.** Other compatibility factors discussed below and elsewhere, may affect hose life and performance. Certain conveyed materials or substances – for example abrasive, high velocity, concentrated, unstable or extreme temperature materials – may present unique compatibility issues. Exposure to environmental conditions such as extreme temperatures, sunlight, ozone, UV radiation, atomic radiation, oil, moisture, salt water and other chemicals must also be considered.

8. Internal Abrasion: Applications involving abrasive or high velocity media can result in premature degradation of the tube and reduced service life, particularly where the hose makes one or more bends.

9. Flexing and Vibration: Flexing, twisting, vibration or other movement of the hose may shorten service life.

10. Modifications to the Hose: Repairing the hose, improperly coupling or re-coupling of the hose, or use of inappropriate fittings and other modifications to the hose will shorten service life and possibly cause immediate failure.

11. Improper Installation: Installing hose assemblies in a manner where the hose is subjected to a torqued condition (twisted lay line); will reduce the life of the hose significantly.

12. Permeation: The molecular structure of rubber hose is permeable, allowing small amounts of the internally conveyed media to migrate through the tube and into and through the cover of the hose. This is a particular concern when hazardous or explosive gases are being conveyed. Likewise, external gases, moisture or liquids, if not abated, may penetrate the cover of the hose and progress into the tube. When permeation is present (in either direction), special precautions may be needed.

⚠ WARNING

CHEMICAL HOSE WARNING

Do not use chemical hose at pressures or temperatures above those recommended by Thermoid. All operators must be thoroughly trained in the care and use of these hoses, and must, at all times, wear protective clothing and other appropriate safety equipment. A hose or system failure could cause the release of corrosive, flammable or poisonous material. Never allow chemicals to drip on the exterior of the hose or allow the hose to lie in a pool of chemicals since the hose cover may not have the same chemical resistance as the inner tube. **If kinking or crushing occurs, immediately subject the assembly to a Hydrostatic Pressure Test and Examination. If the Hydrostatic Test is not an option, immediately replace the assembly. If the reduction of the I.D. is greater than 20%, replace the assembly.**

Extreme care must be taken when flushing out a chemical hose with water or removing clogs. Some chemicals, such as concentrated acids may react with the water. Spattering may occur which could result in serious injury to the eyes or other areas of the body. When flushing the hose, care must be taken so that all chemicals or flushing fluids are disposed of according to EPA recommended guidelines.

⚠ WARNING

STATIC ELECTRICITY WARNING

Serious bodily injury, death, property damage or other loss can result from the use of hose in hazardous or explosive atmospheres due to the buildup of static electricity from the movement of conveyed materials through the hose as well as movement or vibration of the hose against the other surfaces. Hose, as well as the entire system or application, used in such atmospheres must be properly grounded or bonded.

Static electricity, as a source of ignition for flammable vapors, gases and dusts, is a hazard common to a wide variety of industries. A static spark can occur when an electrical charge accumulates on the surfaces of two materials that have been brought together and then separated (between two solids, between a solid and a liquid, or between two immiscible liquids, i.e., incapable of mixing). One surface becomes charged positively and the other surface becomes charged negatively. If the materials are not bonded or grounded, they will eventually accumulate a sufficient electrical charge capable of producing a static spark that could ignite flammable vapors, gases and dusts. Some common processes capable of producing a static ignition are as follows:

- The flow of liquids (for example, petroleum or mixtures of petroleum and water as well as any flammable fluids) through hose, pipes or fine filters.
- The settling of a solid or an immiscible liquid through a liquid (e.g. rust or water through petroleum).
- The ejection of particles or droplets from a nozzle (e.g. water washing operations or the initial stages of filling a tank with oil).
- The vigorous rubbing together and subsequent separation of certain synthetic polymers (e.g. the sliding of a Polypropylene rope through PVC gloved hands).

Preventing and/or dissipating static electricity as an ignition source can be accomplished through bonding, grounding or possibly selecting a different non-static conducting material. Bonding is the process of connecting two or more conductive objects together by means of a conductor. Grounding, or earthing, is the process of connecting one or more conductive objects to the ground.**

Certain Thermoid hose incorporates a static wire, which if properly coupled can be used to ground the hose assembly. Other parts of the application or equipment may have to be grounded as well. Hose that does not contain a ground wire will nevertheless have to be grounded if used in an explosive or hazardous atmosphere. In all applications, it is the user's responsibility to ensure the hose assembly and equipment it is used on, is properly grounded to earth.

*** Excerpts from Process Safety Handling Hazardous Chemicals, 1/97: Standards & Guidelines – Occupational Safety and Health Administration.*

CARE, MAINTENANCE & STORAGE

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 is reached.

⚠ WARNING

Failure to properly follow 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 or death.

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. Hose should be stored to facilitate first-in and first-out usage based on the hose date of manufacture.

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 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 (Please also refer to Hose Test Methods later in this document).

A visual inspection of the hose should be made for loose covers, kinks, bulges, or soft spots 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. 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.

1. ***Air or any other compressible gas must never be used as the test media because of the explosive action of the gas 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. ***If 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 are sprayed over the surrounding area.***

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 lengths 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.

The ideal temperature for the storage of rubber products ranges from 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 limit 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.

Hose Test Methods

⚠ WARNING

Testing can be dangerous and should be done only by trained personnel using proper tools and procedures. Failure to follow such procedures might result in damage to property and/or serious bodily injury or death.

The Association for Rubber Product Manufacturers (ARPM) recognizes, accepts and recommends the testing methods of the American Society for Testing and Materials (ASTM) (Please also refer to General Test and Inspection Procedures for Hose above).

Unless otherwise specified, all hose tests are to be conducted in accordance with ASTM Method No. D-380 (latest version). Where an ASTM D-380 test is not available, another test method should be selected and described in detail.

The ARPM participates with ASTM under the auspices of the American National Standards Institute (ANSI) in Technical Committee 45 (TC45) of The International Organization for Standardization (ISO) in developing both hose product and hose test method standards. Many of the hose test method standards published by ISO duplicate or closely parallel those shown in ASTM D-380. Many are unique and, in those cases, the ARPM may be able to provide the necessary test standard references which may be purchased from the American National Standards Institute (ANSI).

Hydrostatic Pressure Tests

Hydrostatic pressure tests are classified as follows:

1. DESTRUCTIVE TYPE
   a. Burst test
   b. Hold test
2. NON-DESTRUCTIVE TYPE
   a. Proof pressure test
   b. Change in length test (elongation or contraction)
   c. Change in outside diameter or circumference test
   d. Warp test
   e. Rise test
   f. Twist test
   g. Kink test
   h. Volumetric expansion test

Destructive Tests

Destructive tests are conducted on short specimens of hose or hose assembly, as specified in ASTM D380 or the applicable product standard. As the name implies, the hose is destroyed in the performance of the test and should be disposed of afterwards.

a. Burst pressure is recorded as the pressure at which actual failure of the hose or hose assembly occurs by rupture, leakage or other malfunction.
b. A hold test, as defined in ASTM D380, when required, is a means of determining whether weakness will develop under a given pressure for a specified period of time.

Non-Destructive Tests

Non-destructive tests are conducted on a full length of a hose or hose assembly. These tests are for the purpose of eliminating hose with defects which cannot be seen by visual examination or in order to determine certain characteristics of the hose while it is under internal pressure.

a. A proof pressure test is normally applied to hose for a specified period of time. On new hose, the proof pressure is usually 50% of the minimum specified burst pressure, except for woven jacket fire hose, where the proof pressure is twice the service test pressure marked on the hose (67% of specified minimum burst). Hydrostatic tests performed on fire hose in service should be no higher than the service test pressure referred to above. The regulation of these pressures is extremely important so that no deteriorating stresses will be applied, thus weakening a normal hose.
b. With some type of hose, it is useful to know how a hose will act under pressure. All change in length tests, except when performed on wire braid or wire spiraled hydraulic hose, are made with original length measurements taken under a pressure of 0.07 MPa (10 psi). The specified pressure is applied and immediate measurement of the characteristics desired are taken and recorded.

   Percent length change (elongation or contraction) is the difference between the length at 0.07 MPa (10 psi), except hydraulic hose, and that at the specified pressure times 100 divided by the length at 0.07 MPa (10 psi). Elongation occurs if the length of the hose under the specified pressure is greater than at a pressure of 0.07 MPa (10 psi). Contraction occurs if the length at the specified pressure is less than at 0.07 MPa (10 psi). In testing hydraulic hose, the maximum working pressure is applied to a hose at least 600 mm (24 inches) in length for 30 seconds and then released. Reference marks are applied on the hose 500 mm (20 inches) apart (original length). The hose is then repressurized to the maximum working pressure for 30 seconds and the reference marks are measured (final length). The percentage change in length is the difference between the final and original lengths, divided by the original length, times 100.

   % Length Change Formula:

$$\textbf{\% Length Change} = \left(\frac{L_p - L_0}{L_0} \right) \textbf{ x 100}$$

   Where:
   L_0 = Original measured length at 0.07 MPa (10 psi)
   L_p = Pressurized measured length at the specific pressure

c. Percent change in outside diameter (OD) or circumference is the difference between the outside diameter or circumference at 0.07 MPa (10 psi) and that obtained under the specified pressure, times 100, divided by the outside diameter or circumference at 0.07 MPa (10 psi). Expansion occurs if the measurement at the specified pressure is greater than at 0.07 MPa (10 psi). Contraction occurs if the measurement at the specified pressure is less than at 0.07 MPa (10 psi).

   % OD Change Formula:

$$\textbf{\% OD Change} = \left(\frac{\Phi_p - \Phi_0}{\Phi_0} \right) \textbf{ x 100}$$

   Where:
   Φ_0 = Original measured OD (outside diameter) at 0.07 MPa (10 psi)
   Φ_p = Pressurized measured OD (outside diameter) at specified pressure

d. Warp is the maximum deviation from a straight line drawn from fitting to fitting. First, a measurement is taken at 0.07 MPa (10 psi) and then again at the specified pressure. The difference between the two is the warp and is reported to the nearest 5 mm (0.25 inch). Normally this is a feature measured on woven jacket fire hose only.
e. Rise is a measure of the height a hose rises from the surface of the test table while under pressure. The difference between the rise at 0.07 MPa (10 psi) and at the specified pressure is reported to the nearest 5 mm (0.25 inch). Normally, this is a feature measured on woven jacket fire hose only.
f. Twist is a rotation of the free end of the hose while under pressure. A first reading is taken at 0.07 MPa (10 psi) and a second reading at the specified pressure. The difference, in degrees between the 0.07 MPa (10 psi) base and that at the specified pressure is the twist. Twist is reported as right twist (to tighten couplings) or left twist. Standing at the pressure inlet and looking toward the free end of the hose a clockwise turning is right twist and counterclockwise is left twist.
g. Kink test applies to woven jacket fire hose only and is a measure of the ability of hose to withstand a momentary pressure while the hose is bent back sharply on itself at a point approximately 460 mm (18 inches) from one end. Test is made at pressures ranging from 62% of the specified pressure on sizes 76 mm (3 inches) and 89 mm (3.5 inches) to 87% on sizes under 76 mm (3 inches).
h. Volumetric expansion test is applicable only to specific types of hose, such as hydraulic or power steering hose, and is a measure of its volumetric expansion under ranges of internal pressure.

It should be noted that design ratios are dependent on more than the minimum burst. The hose technologist must anticipate natural decay in strength of reinforcing materials, and the accelerated decay induced by the anticipated environments in which the hose will be used and the dynamic situations that a hose might likely encounter in service.

Including all considerations, the following recommended design ratios are given for newly manufactured hose:

a. Water Hose up to 150 psi WP: 3:1
b. Hose for all other liquids, solid materials suspended in liquids or air, and water hose over 150 psi WP: 4:1
c. Hose for compressed air and other gases: 4:1
d. Hose for liquid media that immediately changes into gas under standard atmospheric conditions: 5:1
e. Steam Hose: 10:1

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HOSE SELECTION GUIDE

General

A number of hose specifications have been developed for general application in various industrial, agricultural, automotive or other services. These specifications are based on generally successful performance of the hose in the field as reported by consumers, manufacturers and governmental agencies. The ARPM has published a number of hose specifications which are recommended for use.

Often, additional or new requirements may be imposed on hose because of the severity of service conditions, a change in service conditions, a change in the materials handled or in the method of handling, or the development of new uses or procedures. Hose specifications must then be prepared based on the expected service conditions.

Thermoid does not warrant the suitability or fitness of its hose for any specific application or particular purpose, and the user is responsible for selecting a hose with specifications to meet the service conditions under which it is to be used. Before deciding on size, type, and quality of hose, the user should gather and analyze complete information on the actual service conditions and requirements.

Service Considerations for Hose in Critical Applications

Hose is often used in locations and/or to convey materials where property damage or human injury could occur if the hose and/or associate fittings failed while in service.

⚠ WARNING

The user must ensure that the service conditions are known to the user and to the hose supplier. The improper use of hose or the use of a hose for service applications for which it was not designed may result in serious consequences, including, but not limited to, damage to property and/or serious bodily injury or death.

Information Needed

Hose Dimensions

f. I.D.
g. O.D.
h. Length (state whether overall length or length excluding couplings)
i. Tolerance limitations (if normal ARPM tolerances cannot be used)

Types of Service

a. Material to be conveyed through hose
   1. Chemical name
   2. Concentration
   3. Temperature extremes (low and high)
   4. Solids, description and size
b. Working pressure (including surge)
c. Suction or vacuum requirements
d. Velocity
e. Flow Rate

Operating Conditions

f. Continuous and intermittent service
g. Indoor and outdoor use
h. Movement and geometry of use
i. Flexibility – Minimum bend radius
j. External conditions
   1. Abrasion
   2. Oil (Specify type)
   3. Solvents (Specify type)
   4. Acid (Specify type and concentration)
   5. Temperature Range
      Normal
      Highest
      Lowest
   6. Ozone

Uncoupled Hose

a. Bulk or cut to length
b. Ends
   1. Straight or enlarged
   2. Capped or raw (uncapped)
   3. Soft ends or wire to end

Coupled Hose, Fittings

a. Factory applied
b. Field applied
c. Type of Fitting
   1. Type of thread
   2. Male or female
   3. Reusable/field attachable
   4. Non-reusable
d. Material for Fittings
   1. ANSI (or SAE or ASTM) metal composition specifications

Hose with Built-in Fittings

a. Ends
   1. Threaded (type of thread)
   2. Grooved
   3. Beveled for welding
   4. Integral flange
b. Flanges
   1. Type (threaded, slip-on, welding neck, lap joint)
   2. Pressure rating
   3. Drilling

c. Materials and Dimensions
   1. ANSI (or SAE or ASTM) composition and specifications
   2. Treatment for specific services

Hose Now in Use

a. Type of hose
b. Service life being obtained and description of failure
c. Service life desired

Special Requirements or Properties

a. Electrical and static conductive
b. Flame resistant
c. Sub-zero exposure
d. Non-contaminating to material

Organizations Having Regulations or Specifications for Hose

U.S. Government Agencies

DOD	Department of Defense
DOT	Department of Transportation
FDA	Food and Drug Administration
MSHA	Mine Safety and Health Administration
NHTSA	National Highway Traffic Safety Administration
OSHA	Occupational Safety and Health Administration
PHA	Public Health Administration
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture

Canadian Agencies and Organizations

CGA	Canadian Gas Association
CGSB	Canadian Government Specifications Board
RAC	Rubber Association of Canada

Other Organizations

ABS	American Bureau of Shipping
ANSI	American National Standards Institute
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
BIA	Boating Industry Association
BSI	British Standards Institute
CGA	Compressed Gas Association
DIN	Deutches Institut for Normung – German Standards
DNV	Det Norske Veritas
EN	European Norms
FM	Factory Mutual Research
FPS	Fluid Power Society
ISO	International Organization for Standardization
JIC	Joint Industrial Council (defunct)
JIS	Japanese Industrial Standards
NAHAD	National Association of Hose and Accessories Distributors
NFPA	National Fire Protection Association
	National Fluid Power Association
ARPM	Association for Rubber Product Manufacturers
SAE	Society of Automotive Engineers
TFI	The Fertilizer Institute
UL	Underwriters Laboratories

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Commonly Used Rubber Compounds

ASTM Designation D1418	Common Name	Composition
CM	CPE	Chloronated Polyethylene
CR	Neoprene**	Chloroprene
CSM	Hypalon	Chloro-sulfonyl-polyethylene
ECO	Hydrin	Ethylene oxide and Chloromethyl oxirane
EPDM	Ethylene Propoylene Rubber	Ethylene-propylene-diene-terpolymer
FKM	Fluoroelastomer Viton	Hexafluoropropylene vinylidene fluoride
IIR	Butyl	Isobutylene-isoprene
IR	Polyisoprene	Isoprene, synthetic
NBR	Buna N, Nitrile	Nitrile-butadiene
NR	Natural Rubber	Isoprene, natural
SBR	SBR	Styrene-butadiene
XNBR	Carboxylated Nitrile Rubber	Carboxylated Acrylonitrile Butadiene Rubber

FUEL LINE SAE 30R6

Fuel Line hose is designed for conveying gasoline, E-85, diesel and biodiesel (B-20) fuels in vehicles. It withstands oil, abrasion and ozone and exceeds the burst requirements of the SAE 30R6 specification.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion Heat Oil Ozone

BRANDING: Size SAE30R6 KX Date Made In USA

COVER COLOR: Black

CONSTRUCTION

TUBE: Nitrile

COVER: Nitrile Blend

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +212°F, -40°C +100°C

SPECIFICATIONS: SAE 30R6

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Master Pack Quantity	Approx. Ship Count Wt. (lbs)
00700024048	24048	3/16	25	Spool/Master	6	14.0
00700014032	14032	3/16	50	Carton	1	4.0
00700024049	24049	3/16	250*	Reel	1	21.0
00700024060	24060	1/4	25	Spool/Master	6	18.0
00700014232	14232	1/4	50	Carton	1	5.0
00700024068	24068	1/4	250*	Reel	1	25.0
00700024078	24078	5/16	25	Spool/Master	6	20.0
00700014248	14248	5/16	50	Carton	1	6.0
00700024084	24084	5/16	250*	Reel	1	30.0
00700024088	24088	3/8	25	Spool/Master	6	23.0
00700014254	14254	3/8	50	Carton	1	6.8
00700024100	24100	3/8	250*	Reel	1	32.5
00700024106	24106	7/16	25	Spool/Master	6	27.2

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

PREMIUM FUEL LINE SAE 30R7

Fuel Line hose is designed for conveying gasoline, E-85, diesel and biodiesel (B-20) fuels in vehicles. This premium hose handles higher temperatures, withstands oil, abrasion and ozone.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion Heat Oil Ozone

BRANDING: Size I.D. SAE30R7 KX (UPC) Made in USA Date

COVER COLOR: Black

CONSTRUCTION

TUBE: Nitrile

COVER: Nitrile Blend

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +257°F, -40°C to +125°C (+302°F, 150°C Intermittent)

SPECIFICATIONS: Similar to SAE 30R7

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Master Pack Quantity	Approx. Ship Count Wt. (lbs)
00700025048	25048	3/16	25	Spool/Master	6	14.0
00700015032	15032	3/16	50	Carton	1	4.0
00700025049	25049	3/16	250*	Reel	1	21.0
00700025099	25099	3/16	700*	Reel	1	60.0
00700025060	25060	1/4	25	Spool/Master	6	18.0
00700015232	15232	1/4	50	Carton	1	5.0
00700025068	25068	1/4	250*	Reel	1	25.0
00700025199	25199	1/4	700*	Reel	1	74.0
00700025078	25078	5/16	25	Spool/Master	6	20.0
00700015248	15248	5/16	50	Carton	1	6.0
00700025084	25084	5/16	250*	Reel	1	30.0
00700025299	25299	5/16	700*	Reel	1	88.0
00700025088	25088	3/8	25	Spool/Master	6	23.0
00700015254	15254	3/8	50	Carton	1	6.8
00700025100	25100	3/8	250*	Reel	1	32.5
00700025399	25399	3/8	700*	Reel	1	95.0
00700025106	25106	7/16	25	Spool/Master	6	27.2
00700025107	25107	1/2	25	Carton	1	5.3

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

AUTOMOTIVE BLACK HEATER - OEM

This hose is a replacement original equipment hose on most cars and light trucks for higher under hood temperatures. Black Heater hose feature kink-resistant EPDM tube and covers that are designed to resist cracking and weather checking and to withstand the abuse of corrosive additives, ozone and abrasion. The multi-spiral polyester in this hose is reinforced to maintain flexibility even in extreme temperatures.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Coolant, Heat

Kinking, Ozone, Weathering

BRANDING: Thermoid (Size) I.D. OEM Heater Hose (UPC) Made in USA (Date)

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +257°F, -40°C +125°C

SPECIFICATIONS: Similar to SAE 20R3 Class D2, SAE J2387

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700001825	1825	½	50	1 per Carton	10.0
00700001826	1826	⅝	50	1 per Carton	12.0
00701826250	1826250	⅝	250*	1 per Reel	60.0
00700001827	1827	¾	50	1 per Carton	13.0
00700001828	1828	1	50	1 per Carton	20.0

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

AUTOMOTIVE BLACK HEATER – STANDARD

This standard grade hose is a replacement for hose on most cars and light trucks. Black Heater hose feature kink-resistant EPDM tube and covers that are designed to resist cracking and weather checking and to withstand the abuse of corrosive additives, ozone and abrasion. The multi-spiral polyester in this hose is reinforced to maintain flexibility even in extreme temperatures.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Coolant, Heat, Kinking, Ozone, Weathering

BRANDING: Thermoid (size) Heater Hose Made In USA

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +212°F , -40°C +100°C

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700001725	1725	½	50	1 per Carton	9.0
00700001726	1726	⅝	50	1 per Carton	11.0
00700001727	1727	¾	50	1 per Carton	12.0
00700001728	1728	1	50	1 per Carton	18.0

AUTOMOTIVE SUPER-SIL HEATER

Designed for heavy-duty applications, this hose features a special silicone compound that meets SAE standard 20R3 for class A hose. It is designed to be highly resistant to the deteriorating effects of oil, ozone, coolants and coolant additives. The nylon reinforcement enables this hose to be extremely flexible while resisting temperatures up to +347F° (+175°C).

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Coolant · Heat · Oil · Ozone

BRANDING: Thermoid Size Super-Sil Silicone Heater Hose Made In USA

COVER COLOR: Blue

CONSTRUCTION

TUBE: Silicone

COVER: Silicone

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -65°F to +347°F, -54°C +175°C

SPECIFICATIONS: SAE 20R3 HT Class A

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700201425	201425	¼	25	1 per Carton	2.3
00700201450	201450	¼	50	1 per Carton	4.5
00702014250	2014250	¼	250	1 per Reel	30.0
00700203825	203825	⅜	25	1 per Carton	3.7
00700203850	203850	⅜	50	1 per Carton	7.4
00702038250	2038250	⅜	250	1 per Reel	44.0
00700201225	201225	½	25	1 per Carton	4.5
00700201250	201250	½	50	1 per Carton	9.0
00702012250	2012250	½	250	1 per Reel	52.0
00700205825	205825	⅝	25	1 per Carton	5.4
00700205850	205850	⅝	50	1 per Carton	10.8
00702058250	2058250	⅝	250	1 per Reel	61.0
00700203425	203425	¾	25	1 per Carton	6.3
00700203450	203450	¾	50	1 per Carton	12.6
00702034250	2034250	¾	250	1 per Reel	70.0
00700201025	201025	1	25	1 per Carton	8.7
00700201050	201050	1	50	1 per Carton	17.4
00702010100	2010100	1	100	1 per Carton	94.0

RED HEATER - PREMIUM

This premium hose is a replacement for original equipment hose on most cars and light trucks for higher under hood temperatures. This hose was designed to withstand the abuse of corrosive solutions and additives and resists weathering to help extend the service life.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Coolant Heat Oil Ozone

BRANDING: Thermoid (Size) I.D. Premium Heater Hose (UPC) Made in USA Date

COVER COLOR: Red

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +257°F, -40°C +125°C

SPECIFICATIONS: Similar to SAE 20R3 Class D2, SAE J2387

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700001835	1835	½	50	1 per Carton	11.0
00700001836	1836	⅝	50	1 per Carton	13.0
00700001837	1837	¾	50	1 per Carton	14.0

RED HEATER - PREMIUM THERMAL

This premium thermal hose contains a blue insulating layer that helps to minimize heat loss and contains a 4-spiral polyester reinforcement for extra strength. This hose is a replacement for original equipment hose on most cars and light trucks for higher under hood temperatures. It is designed to withstand the abuse of corrosive solutions and additives and resists weathering to help extend the service life.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion Coolant Ozone

BRANDING: Thermoid (Size) I.D.
Premium Thermal Heater Hose (UPC)
Made in USA Date

COVER COLOR: Red

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 4-Spiral Polyester

TEMPERATURE RANGE: -40°F to +257°F, -40°C +125°C

SPECIFICATIONS: Similar to SAE 20R3 Class D2, SAE J2387

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700006350	6350	½	50	1 per Carton	11.0
00700005908	5908	⅝	50	1 per Carton	14.0
00700005910	5910	¾	50	1 per Carton	17.0
00700005916	5916	1	50	1 per Carton	25.0

HEAVY-DUTY IMPACT TOOL AIR

Designed for tough service station and shop applications, this kink resistant hose is flexible in a wide range of temperatures. The cover is resistant to abrasion, weathering and ozone. This hose is rated at 250 psi working pressure and available coupled with brass fittings.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Heat, Kinking, Ozone, Weathering

BRANDING: Thermoid ½" HD Impact Tool Air Hose (UPC) Made In USA

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 4-Spiral Polyester

TEMPERATURE RANGE: -40°F to +212°F, -40°C +100°C

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Working Pressure	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700041250	412-50	½	250	50	1 per Carton	14.0

MxM COUPLED ½" NPT

IMPACT TOOL AIR

Designed for tough service station and shop applications, this kink resistant hose is flexible in a wide range of temperatures. The cover is resistant to abrasion, weathering and ozone. This hose is rated at 250 psi working pressure and available coupled with brass fittings.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Heat, Kinking, Ozone, Weathering

BRANDING: Thermoid ⅜" Impact Tool Air Hose (UPC) Made In USA

COVER COLOR: Red

CONSTRUCTION

TUBE: EPDM, Medium Oil Resistant

COVER: EPDM

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +212°F, -40°C to +100°C

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Working Pressure	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700053825	538-25	⅜	250	25	1 per Carton	6.0
00700053850	538-50	⅜	250	50	1 per Carton	10.0
00700043825 *Point of purchase add disk.	438-25	⅜	250	25	1 per Carton	6.0
00700043850 *Point of purchase add disk.	438-50	⅜	250	50	1 per Carton	10.0
00700438300	438-R3	⅜	250	300**	1 per Reel	55.0

**Disk option*

***Maximum 2 piece spool or reel. No piece less than 50 feet.*
MxM COUPLED ¼" NPT

SERVICE STATION AIR

Designed for tough service station and shop applications, this kink resistant hose is flexible in a wide range of temperatures. The cover is resistant to abrasion, weathering and ozone. This hose is rated at 250 psi working pressure and available coupled with brass fittings.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Heat, Kinking, Ozone, Weathering

BRANDING: Thermoid ¼" Service Station Air Hose (UPC) Made In USA

COVER COLOR: Red

CONSTRUCTION

TUBE: EPDM

COVER: EPDM

REINFORCEMENT: 2-Spiral Polyester

TEMPERATURE RANGE: -40°F to +212°F, -40°C +100°C

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Working Pressure	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700052225	522-25	¼	250	25	1 per Carton	5.0
00700052250	522-50	¼	250	50	1 per Carton	8.8
00700042225 *Point of purchase add disk.	422-25	¼	250	25	1 per Carton	5.0

**Disk option*

MxM COUPLED ¼" NPT

AUTOMOTIVE AIR BRAKE

Air Brake hose is engineered to convey air in truck and trailer brake systems and is designed for truck and trailer manufacturers, aftermarket packagers and wholesalers. This hose is certified to meet D.O.T. FMVSS 106 and meets SAE standard J1402A requirements. This kink resistant hose features an EPDM tube and cover with 4-spiral polyester reinforcement.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion Kinking

BRANDING: KX Air Brake Size A SAE J1402 Made in USA DOT KX Size (mm)A Date and time stamp

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM, RMA - Class C

COVER: EPDM, RMA - Class C

REINFORCEMENT: 4-Spiral Polyester

TEMPERATURE RANGE: -40°F to +200°F, -40°C to+93°C

SPECIFICATIONS: SAE J1402A/D.O.T. FMVSS 106

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00482106498	N26-R	⅜	250*	1 per Reel	57.0
00482106499	26286	⅜	500*	1 per Reel	114.0
00482108451	N27-5	½	50	1 per Carton	11.0
00482108498	N27-R	½	250*	1 per Reel	65.0
00482108500	N27-R5	½	500*	1 per Reel	130.0

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

DRIVEWAY SIGNAL CALL TUBING

This EPDM rubber tubing is designed for service station signal bell service. It resists abrasion, weathering, ozone, heat and cold while remaining flexible, resisting collapsing and cracking.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion Heat Ozone Weathering

BRANDING: None

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM

TEMPERATURE RANGE: -40°F to +250°F, -40°C +121°C

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700520100	520-100	⅜	100	1 per Carton	13.0

POWER STEERING RETURN

This hose designed for return side only, is built to help resist power steering fluid. This hose is made with polyester reinforcement for high burst strength. Its Nitrile Blend cover provides moderate oil resistance and weather, ozone and abrasion resistance to help extend its service life.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Abrasion, Heat, Oil, Ozone, Weathering

BRANDING: Size I.D. Made In USA

COVER COLOR: Black

CONSTRUCTION

TUBE: Nitrile

COVER: Nitrile Blend

REINFORCEMENT: Polyester

TEMPERATURE RANGE: -30°F to +257°F, -34°C to +121°C

SPECIFICATIONS: Similar to SAE J189

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700003820	3820	⅜	25	1 per Carton	4.0

TRANSMISSION OIL COOLER

This hose is designed for circulating transmission fluid at high temperatures. Featuring a polyester reinforcement for high burst protection this hose withstands fluid temperatures up to 257° F and is resistant to fuel, ozone, oil heat and aging.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Aging Heat Oil Ozone

BRANDING: Thermoid Transmission Oil Cooler (Size) Made in USA (Date)

COVER COLOR: Black

CONSTRUCTION

TUBE: Nitrile

COVER: Nitrile Blend

REINFORCEMENT: Polyester

TEMPERATURE RANGE: -30°F to +257°F, -34°C +125°C

SPECIFICATIONS: Similar to SAE J1532

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Approx. Ship Count Wt. (lbs)
00700032998	32998	5/16	25	1 per Carton	4.0
00700032999	32999	5/16	250*	1 per Reel	23.0
00700031616	31616	3/8	25	1 per Carton	4.5
00700031617	31617	3/8	250*	1 per Reel	25.0

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

WINDSHIELD WIPER & VACUUM TUBING

This low-pressure EPDM tubing is designed for windshield washers, vacuum and emissions systems for power accessories. This hose is heat, weathering and ozone resistant and maintains its flexibility even at low temperatures.

⚠ WARNING
Do not use this product as a steam hose.

Representative image photo see BRANDING below for product stamp.

RESISTANCE

Heat Ozone Weathering

BRANDING: None

COVER COLOR: Black

CONSTRUCTION

TUBE: EPDM

TEMPERATURE RANGE: -40°F to +257°F, -40°C to +125°C

SPECIFICATIONS: Similar to SAE J1037

Thermoid Product Code	Automotive Product Number	Inside Diameter (in)	Length (ft)	Standard Pack Quantity	Master Pack Quantity	Approx. Ship Count Wt. (lbs)
00700333850	333850	3/32	50	Spool/Master	6	7.0
00700333950	333950	7/64	50	Spool/Master	6	12.0
00703339250	3339250	7/64	250*	Reel	1	6.1
00700334050	334050	5/32	50	Spool/Master	6	18.0
00703340250	3340250	5/32	250*	Reel	1	13.6
00700334150	334150	7/32	50	Spool/Master	6	24.0
00703341250	3341250	7/32	250*	Reel	1	10.6
00700334250	334250	9/32	50	Spool/Master	6	26.0
00703342250	3342250	9/32	250*	Reel	1	19.6

**Maximum 2 piece spool or reel. No piece less than 50 feet.*

WARNINGS/CAUTION

⚠ WARNING

In any application there may be an inherent risk of bodily injury or property damage and user is responsible for proper use and implementation of adequate safety precautions. It is the responsibility of the buyer to advise user of proper instructions for safe use and/or precautions, proper coupling procedure and to warn user of consequences of failure to heed such instruction. Should a hose assembly fail during use with pressure, injurious and/or damaging chemicals, elevated temperature materials, explosives, or flammable materials, then serious bodily injury, death or destruction of property could result from impelled couplings, whipping hose, high pressure or high velocity discharge, chemical contact, high temperature materials, explosion, or fire.

In known high risk areas, it is recommended that hose inspections be performed at frequent intervals related to risk factor. Hose with obvious damage should be scrapped or tested before placing in use. These inspections should include tube condition, cover condition, leaking or slipped couplings, and proof test.

We have attempted to list some of the standard references below. This is a limited list, for specific details see standard itself.

1. Federal Coast Guard Regulation on Dock Hose—Federal Register 12-21-72,Vol. 37, No. 346, Part II, Section 154.500, 155.800, 156.170.
2. NFPA 196 Standard for Fire Hose.
3. NFPA 198 Care and Maintenance of Fire Hose.
4. NFPA 407 Care and Maintenance of Aircraft Refueling.
5. ARPM—Storage, Care, Maintenance.
   - General
   - OS&D
   - LPG
   - Aircraft Ground Refueling
   - Motor Vehicle
   - Anhydrous Ammonia
   - Welding Hose
   - Steam
6. ARPM—Industry Hose Specs.
   - Hydraulic Hose
   - ARPM-CGA Welding
   - ARPM-ANSI Anhydrous Ammonia
   - ARPM-LPG
   - OS&D
   - 300, 400, 600# Fire Hose
7. ASTM-296 Fire Hose Spec.

⚠ WARNING

Rubber products contain a variety of chemicals and substances. Accelerators, such as mercaptobenzothiazole and thiuram, are chemicals contained in most rubber products that are used to speed the vulcanization process. Certain individuals may develop contact dermatitis and other allergic reactions as the result of exposure to mercaptobenzothiazole, thiuram and perhaps other chemicals contained in rubber products. Such reactions may develop and become more severe as the individual is sensitized with repeated exposure over time. If you develop any reactions from exposure to rubber products, avoid further contact with such products and consult with a physician experienced in treating such allergies.

CAUTION: Product descriptions and specifications for products become dated. All product literature and information is subject to change, including the specifications outlined in this publication.For questions concerning any technical and/or product application information on the products contained in this catalog, please contact Thermoid's Customer Service Department at 800/543-8070 or log onto www.thermoid.com.

TERMS & CONDITIONS OF SALE

Visit our website for our current Terms and Conditions of Sale: https://www.thermoid.com/terms-conditions-of-sale

COMMERCIAL POLICY

ORDER POLICIES

Freight

- Orders $4,000 or greater, Prepaid, FOB Origin (Continental USA)
- Orders less than $4,000, Collect, FOB Origin
- Blanket Orders:
  - Each release required to meet $4,000 to qualify for PrePaid Freight
- Minimum Order is $500.00

MINIMUM REQUIREMENTS FOR NON-STOCK PRODUCTS

- Non-Stock includes private brand, customized packaging, size, style, color or any item not identified as a stock item in our product catalog.
- All Non-Stock orders are subject to prior approval.
- Minimum Order Requirement – 15,000 ft.
- Thermoid reserves the right to ship ±10% on all non-stock products.
- All branding modifications must be approved.

PRIVATE BRANDING

A one-time branding charge of $250.00 will be applied to the initial order.

CUT LENGTH REQUIREMENTS

- Minimum Order Requirement – 15,000 ft.
- Product Manager approval required for any exception.
- Thermoid reserves the right to ship ±10% on all cut length orders.

CIA ORDERS

Payment must be received 15 days from the date PO is received or it will be cancelled.

CREDIT CARDS

We do not currently accept credit card payments.

WARRANTY

Seller warrants its products shall be free from defects in material and workmanship under normal use and service for a period of 12 months from date of shipment. On equipment and materials furnished by Seller but manufactured by others, Buyer shall accept in lieu of any liability or warranty on the part of the Seller, the benefits of the warranties are obtained by Seller from such manufacturers or vendors.

RESTOCK REQUESTS

- Valid only for current stock products shipped within the past 12 months.
- Product must be in resalable condition.
- A 25% restock fee will apply to all returned product
- Customer pays freight on returned product.
- Prior Product Manager approval required.

RETURN POLICY

Failure by Buyer to object to or reject products or materials delivered hereunder, in writing within 30 days from the date of shipment of the products or materials, shall constitute an acceptance and waiver by Buyer of all claims hereunder on account of alleged errors, shortages, defective workmanship or material, breach of warranty or otherwise, discoverable upon inspection by Buyer.

In the event of a quality issue, customers shall contact Territory Sales Manager or Customer Service to initiate the complaint process. Once evaluated, if the complaint results in an RMA (Return of Material Authorization), the customer has 30 days to return the product. If the product is not returned in 30 days, the RMA will be cancelled.

HOSE LENGTHS

Some hose types have a tendency to shrink or shorten during shipment or storage. This is especially true of very flexible hoses that have a helical wire embedded in the carcass. Consequently, the actual length should be determined by measuring under hydrostatic pressure of 0.07 MPa (10 psi). When these hoses are subjected to working pressure, they generally will return to their original manufactured length.

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Flex Strength® Bellefontaine Plant

Standard Packaging	Feet Per Reel			
	¼″ - 1″ I.D.	1¼″ I.D.	1½″ I.D.	2″ I.D.
Maximum feet per reel*	700'	550'	400'	250'
Maximum pieces per reel	2	2	2	2
Minimum length**	50′	50′	50′	50′

***Exception:** 1″ Dari Preen reels are 600′ max
**A large percentage of our hose is packaged on one-piece reels. However, in those few instances where a two-piece reel is necessary, you will be billed in multiples of 50 feet.
(If one length is 390 ft., you will be billed for 350 ft.)

- Our modern Concure® process prohibits the manufacture of three or more lengths per reel. As such, we cannot offer a discount for this type of special packaging—remnants or seconds.
- Examples below:

Length 1	**390 ft**	Length 1	**235 ft**	Length 1	**240 ft**	Length 1	**220 ft**
Length 2	**350 ft**	Length 2	**350 ft**	Length 2	**200 ft**	Length 2	**50 ft**
Billed	**700 ft**	Billed	**550 ft**	Billed	**400 ft**	Billed	**250 ft**

Thermocure Oneida Plant

Standard Packaging	Feet Per Reel			
	¼″ - ¾″**	1″	1¼″	1⅜″ and 1½″
Maximum feet per reel	500	500	400	250
Maximum pieces per reel	2	2	2	2
Minimum length	50′	50′	50′	50′

Note: While we strive to achieve the longest lengths possible, two-piece reels are common.
In those instances where a multiple length reel is necessary, no length will be shorter than 50 feet.
**Product available in one-piece reels with 15% surcharge.

For special items contact your Thermoid representative for minimum requirements

WARNING/SAFETY

WARNING

This catalog is intended to provide general guidance and to assist in making the proper hose selection for an application. While the information in this catalog is believed to be accurate, it is based on specific laboratory tests performed under controlled conditions, calculations and assumptions, and not actual field conditions or applications. As such, it does not represent a guarantee with respect to characteristics or performance of the product in any given application or use. Thermoid hose products are intended for selection and use by trained and skilled purchasers and users. The purchaser or user is obligated to determine the suitability of hose for the specific application or use, and to ascertain that intellectual property rights of third parties are not violated.

Thermoid MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, EXCEPT AS IS EXPRESSLY SET IN ITS TERMS AND CONDITIONS OF SALE. Thermoid SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. See our terms and conditions of sale for further details.

This catalog contains important information regarding the Thermoid hose products, including information on the following topics:

- Welding Hose
- Chemical Hose and Chemical Resistance Chart
- Steam Hose
- Use of Hose in Explosive Atmospheres (Static Electricity)

Please read and understand these and other available guidance before selecting or recommending a hose for your application. Information in this catalog is subject to revision without notice. For the most current product information visit our website at www.thermoid.com or contact your Thermoid Customer Service Representative.

SAFETY

Hose has a indeterminate and limited life, and is subject to fail without warning. Careful consideration is required when using hose instead of hard piping in any application where failure could cause bodily injury, death, property damage or other loss. If hose is used, the user is responsible for determining the service life and implementing adequate safety measures including:

- **Regular Inspections and Replacement.** Hose assemblies used in such applications should be inspected at frequent intervals based on application and seriousness of the risk. These inspections should include: tube and cover examinations for hardening, brittleness, abrasions, kinks, twisting, crushed areas, cracks, cuts, leaking, blisters, peeling or soft cover, braid exposure and other evidence of damage or deterioration; seepage, leaking, slipped or damaged couplings; and proof testing. Damaged or suspect hose and fittings should be immediately replaced. Hose assemblies should also be replaced at regular intervals, well in advance of the expected service life of the hose.
- **Personal Protective Equipment and Other Safeguards.** Always use proper protective equipment (for example, gloves, eye protection, protective suits, hardhats, etc.) that will protect the user in the event of hose failure or other accident. Systems should be designed so that if a failure does occur, damage and injury to persons or property will be avoided or minimized.
- **Operator Training.** All operators must be thoroughly trained in the proper care and use of hoses, the hazards of any material conveyed, and accidental release response measures. Failure to exercise proper safety precautions could result in serious bodily injury, death, property damage or other loss from hazardous chemicals, elevated temperature materials, explosive or flammable materials, sparking or static electricity, contamination of material conveyed, impelled couplings, whipping hose, and high pressure or high velocity discharge of materials.

For further information, please refer to the "General Hose Information" section near the beginning of this catalog, that details various areas, including: ARPM Oil Resistance Data, Minimum Hose Radius, Basic Safety Considerations & Warnings, Steam/Chemical and Static Electricity Warnings, Hose Care, Maintenance and Storage, Hose Test Methods, Hose Coupling Selection Guide as well as other specific product guidance information pages found throughout this catalog. You may also contact a Thermoid marketing or technical representative for assistance.

Made in U.S.A.

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