

# GENERAL HOSE INFORMATION

## The Thermoid® Brand Advantage!

HBD/Thermoid® produces durable, top-quality hose products with lots of value-added features. The CONCURE® continuous manufacturing process was invented, developed and patented by HBD Industries, Inc. 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. This process and our continuous product quality monitoring give us improved dimensional control and allow for closer tolerance control of the I.D. and O.D. of the hose from the tube extruder to the finished reel on all our Flex Strength® hose products. This attention to manufacturing saves our customers time and money. Here are just a few of the benefits you receive by selecting Flex Strength hose products:

- **Long Length Reels** — Over 90% of our reels contain one length of hose, absolutely 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.
- **Brighter Colors/Pin-Pricked Covers** — The CONCURE process provides for more vivid colors for increased visibility and easier identification. Usually present only on critical applications, 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, type, Made In USA. Optional branding information is available for private branding as well.

## HBD/Thermoid® Inc. – Leadership through Technology

HBD/Thermoid, Inc. has been and continues to be a leader in developing innovative hose product designs and manufacturing production techniques. This long-term commitment to hose manufacturing benefits all of our customers. 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. Outlined below are a few examples of the many hose products, design types and unique manufacturing techniques that assist customers with their daily hose product needs:

### Handbuilt

With over 100 years of design experience, **HBD/Thermoid, Inc.** is the leader in handcrafted hose. The line is built by an experienced design team, using a computer-aided system that has received worldwide product approvals. This hose line is not your everyday water hose; it's one that encompasses products like submarine, rotary and the patented Hy-Flex™ dock hose.

### Spiral

HBD/Thermoid's LX-200 production lines now produce a selection of Thermoid's most popular hoses in continuous lengths to 200 feet. The most notable example is the **Transporter®** line, which encompasses a wide variety of markets such as petroleum, material handling, chemical and food service.

### Thermocure

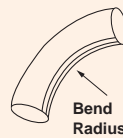
With this process, **HBD/Thermoid** has become a potent force in the PED, Fuel Oil Delivery and LP Gas markets with such product lines like the Hi-Vac™ and Superlite® vapor recovery hoses, the Cobra™ FOD hose and the Type 75 LP Gas hose, just to name a few. The Thermocure process gives these first class products, a showroom quality look.

## RMA 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 the length of exposure. The RMA (Rubber Manufacturers Association) has developed a classification of hose performance based on sample immersions in ASTM No. 3 oil (High Swell) at 212°F for 70 hours. Oil resistance classifications for rubber stocks are shown in the table below.

Hose Physical Properties After Exposure to Oil		
Classification	Volume Change Maximum	Tensile Strength Retained
<b>Class A</b> (High Oil Resistance)	+25%	80%
<b>Class B</b> (Medium-High Oil Resistance)	+65%	50%
<b>Class C</b> (Medium Oil Resistance)	+100%	40%

## 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.

Given *r* = 4.5 inches

$$\frac{90^\circ}{360^\circ} [2 \times 3.14 \times 4.5]$$

$$.25 \times 2 \times 3.14 \times 4.5 = 7" \text{ (inches)}$$

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.

\* Reprinted with permission from the Rubber Manufacturers Association (RMA) Hose Handbook, RMA/IP-2/2003.