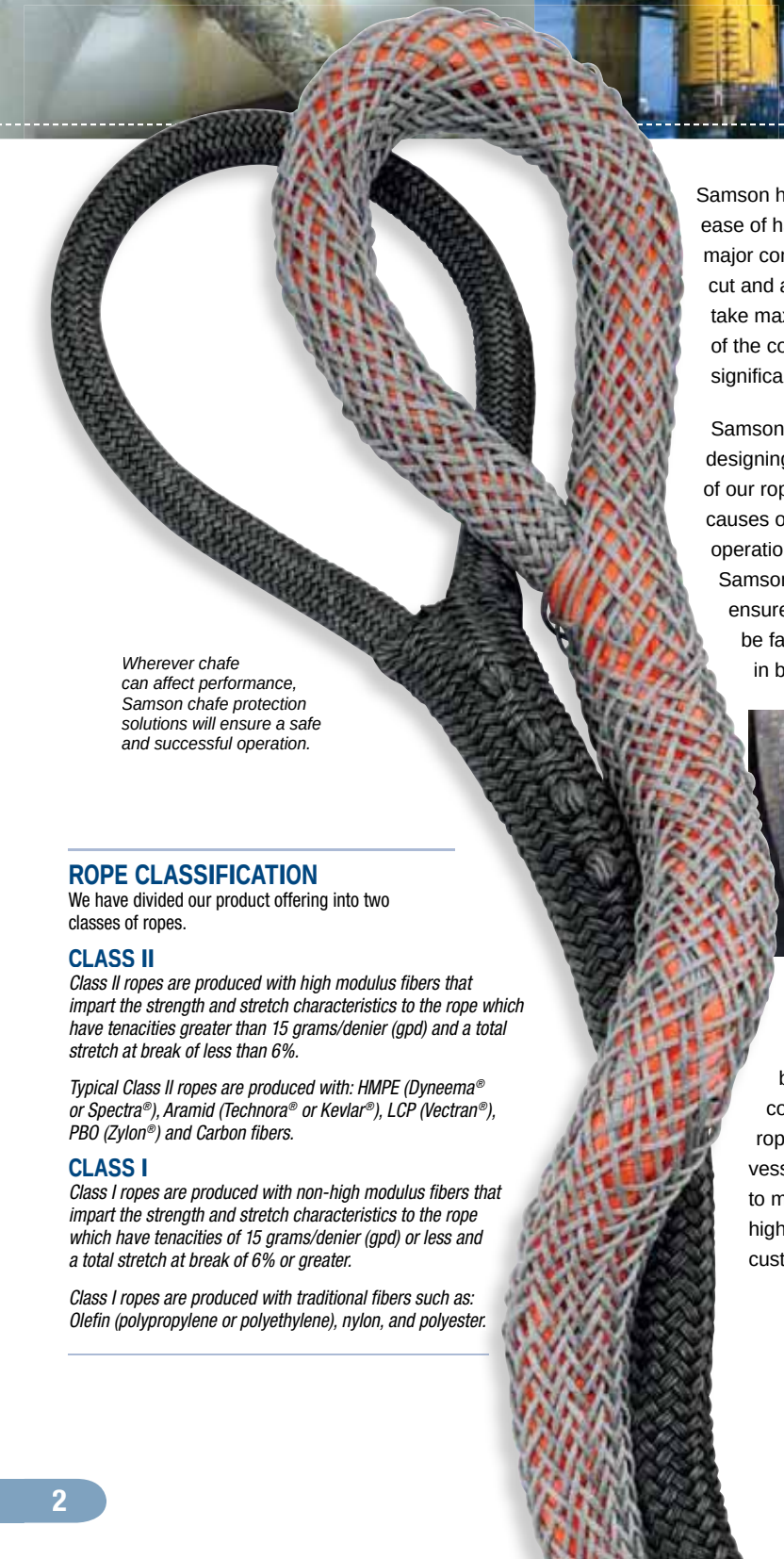
SAMSON®

THE STRONGEST NAME IN ROPE

Innovative Chafe Protection Solutions and Hardware for High-Performance Ropes

Innovative Chafe Protection for High-Performance Ropes

Samson has the most innovative chafe solutions to extend the life of your synthetic ropes



Wherever chafe can affect performance, Samson chafe protection solutions will ensure a safe and successful operation.

Samson high-performance synthetic ropes have been engineered to provide ease of handling, extreme strength, and long service life. Dyneema® fiber, a major component in many of Samson's high-performance ropes, is extremely cut and abrasion resistant. While properly designed and engineered ropes take maximum advantage of this resistance, in the real world environment of the commercial marine industry, protecting ropes from abrasion and cutting significantly increases service life.

Samson has committed substantial research and development resources to designing a line of chafe protection products that maximize the service life of our ropes. The result is a family of products perfectly suited to combat the causes of cutting and abrasion encountered in offshore, mooring, and tug operations. Because each application has its own characteristic requirements, Samson has developed a full range of options to protect your investment and ensure the longest service life for your working ropes. All chafe options can be factory-installed on your ropes prior to shipment, or they are available in bulk for field installation.

Samson chafe protection products are perfectly suited to combat the causes of cutting and abrasion encountered in offshore, mooring, and tug operations.

When replacing wire ropes with synthetics, it is important to prepare or repair the surfaces of deck equipment damaged or scored by abrasion. Chocks, fairleads, bollards, bitts or other hardware contacting the rope need to be smooth and free of rust to ensure your ropes' longest life. A Samson representative is available to visit your vessel to assess the hardware condition and advise on proper preparation to maximize the service life of your ropes. That's the Samson Advantage: high-performance, reliable products, innovative engineering, and the best customer service in the industry.

ROPE CLASSIFICATION

We have divided our product offering into two classes of ropes.

CLASS II

Class II ropes are produced with high modulus fibers that impart the strength and stretch characteristics to the rope which have tenacities greater than 15 grams/denier (gpd) and a total stretch at break of less than 6%.

Typical Class II ropes are produced with: HMPE (Dyneema® or Spectra®), Aramid (Technora® or Kevlar®), LCP (Vectran®), PBO (Zylon®) and Carbon fibers.

CLASS I

Class I ropes are produced with non-high modulus fibers that impart the strength and stretch characteristics to the rope which have tenacities of 15 grams/denier (gpd) or less and a total stretch at break of 6% or greater.

Class I ropes are produced with traditional fibers such as: Olefin (polypropylene or polyethylene), nylon, and polyester.

UNDERSTANDING ABRASION

There are two types of abrasion: internal abrasion caused by the relative movement of internal and external yarns, and external abrasion caused by contact with external surfaces. An unprotected rope moving over a rough surface, such as a poorly maintained chock can be subjected to both. Upon inspection, it's easy to see that the external strands are abraded by a rough surface: often, fibers can be left behind on the surface that caused the abrasion, and the surface of the rope readily shows abraded yarns.

The same rough surfaces can also cause internal abrasion due to the movement of the internal strands relative to each other. When the rope's surface strands pass over rough surfaces, they are slowed relative to the strands next to them, causing friction. Heat is created from friction—and heat is among the biggest enemies of synthetic ropes.

In the real world environment of the commercial marine industry, protecting ropes from abrasion and cutting significantly increases service life.

Fortunately, the effects of both types of abrasion are easily mitigated. Proper surfacing of hardware is easily addressed. Grinding and smoothing of surfaces prior to the installation of synthetic ropes is standard procedure, (guidelines for surface preparation suitable for synthetic ropes are available on the Samson website at ***SamsonRope.com***) and hardware specifically made for use with synthetic ropes is also available.

Because lines are often subjected to surfaces not under your control, like mooring bollards roughened and scored by wire ropes, proper chafe gear is essential. Table 1 illustrates two ropes: one with chafe protection and one without. Both ropes were exposed to identical working conditions but have different outcomes. The rope with chafe protection performed better proven by the higher percentage of average residual strength. This is because properly designed chafe gear acts as a sacrificial layer for external abrasion from rough surfaces, and also reduces internal abrasion by keeping relative fiber movement at the surface of the rope.

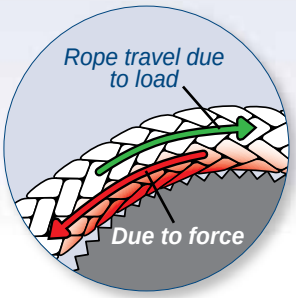
Samson has designed chafe gear specifically for high-performance ropes, providing a complete line of chafe products to protect working lines in daily use.

External abrasion without protection

External abrasion with protection

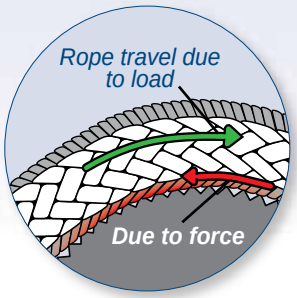
Internal abrasion without protection

Internal abrasion with protection



WITHOUT CHAFE GEAR (HMPE ON METAL)

Friction caused by poorly surfaced deck hardware causes both external abrasion to surface strands and abrasion to internal strands by creating relative movement between the fibers in the rope.



WITH CHAFE GEAR (HMPE ON HMPE)

External abrasion is primarily limited to the chafe gear itself, and the relative movement of internal and external fibers is greatly reduced or eliminated completely.

TABLE 1 Residual strength and safety factor for AmSteel®-Blue with and without chafe protection.

	WITH CHAFE PROTECTION	WITHOUT CHAFE PROTECTION
Number Of Jobs	630	704
Average Residual Strength *(% Published Min. Break Strength)*	61%.	41%
Remaining Safety Factor	3:1	2:1

Dynalene

Product Code: 975

Dynalene is a unique product that protects the strength member from abrasion, yet allows the rope to be easily inspected for both internal and external fiber wear. Braided from cut and abrasion resistant Dyneema® fiber, Dynalene is permanently spliced over the rope, and acts as a sacrificial cover protecting the rope from abrasion and wear in mooring and offshore applications.

Dynalene is fully repairable in the field, does not absorb water, and floats. It is easy to install anywhere on the rope.

FEATURES:

- > Lightweight
- > Floats
- > Easy inspection without removal
- > Excellent durability

DYNALENE SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
SMALL	7/8 – 1-1/4 in.	22 – 30 mm	2-3/4 – 3-3/4 in.	66 – 90 mm
MEDIUM	1-5/16 – 1-5/8 in.	32 – 40 mm	4 – 5 in.	96 – 120 mm
LARGE	1-3/4 – 3 in.	44 – 72 mm	5-1/2 – 9 in.	132 – 216 mm
EXTRA-LARGE	3-1/4 – 4 in.	80 – 96 mm	10 – 12 in.	240 – 288 mm

When installing over a splice area, add two sizes to your rope diameter and then select the appropriate Dynalene size.

Dynalene can be installed as a fixed or adjustable chafe solution.

Great choice for mooring and offshore applications. Field repairable, rope is easily inspected without removal.

WITH Dyneema®

DC Gard

Product Code: 706

DC Gard is a tightly braided cover construction of Dyneema® fiber that is spliced onto the strength member to protect it from wear and abrasion in specific areas. Designed for use in applications like tug operations, where frequent handling and use put a premium on rope protection and resistance to snagging. For vessels where frequent mooring operations are the norm, DC Gard provides maximum protection for working ropes. PATENT PENDING.

If operating in a regions where extreme heat is an issue, contact Customer Service for information about Samson's TC Gard made with Technora®.

FEATURES:

- > Light and flexible
- > Floats
- > Can be removed for rope inspection
- > Cut resistant
- > Superior durability

DC GARD SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE* INCHES	FITS ROPE CIRCUMFERENCE* MILLIMETERS
SIZE C	1 – 1-1/4 in.	24 – 30 mm	3 – 3-1/2 in.	72 – 84 mm
SIZE D	1-5/16 – 1-3/4 in.	32 – 44 mm	3-3/4 – 5-1/2 in.	90 – 132 mm
SIZE E	1-7/8 – 2-1/2 in.	46 – 60 mm	5-3/4 – 6-1/2 in.	138 – 156 mm
SIZE F	2-5/8 – 3-1/8 in.	64 – 76 mm	7 – 8-3/4 in.	168 – 210 mm
SIZE G	3-1/4 – 4-1/4 in.	80 – 104 mm	9 – 10-1/2 in.	216 – 256 mm
SIZE H	4-1/2 – 5-3/4 in.	110 – 140 mm	11 – 18 in.	264 – 432 mm
SIZE I	6 – 6-3/4 in.	144 – 170 mm	18 – 20-1/4 in.	432 – 486 mm
SIZE J	7 – 7-3/4 in.	178 – 196 mm	21 – 23-1/4 in.	533 – 587 mm
SIZE K	8 in.	203 mm	24 in.	605 mm

Contact Customer Service to calculate size for installing over splice. Also available to fit spliced areas of larger diameter ropes.

WITH Dyneema®

Can be removed for rope inspection, excellent choice for tug and mooring applications.

DC Gard provides maximum protection for working ropes.

Product Code: 706

DC Moor-Gard

With the same Dyneema® fiber cover construction as DC Gard, DC Moor-Gard is a tubular protectant from wear and abrasion. The ends can be coated in either orange or blue urethane. The standard length is 10 feet, with longer lengths available by request.

FEATURES:

- > Fixed or adjustable for easy positioning
- > Light and flexible
- > Floats
- > Easily removed for rope inspection
- > Cut resistant
- > Superior durability

DC MOOR-GARD SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
SIZE E	1 – 1-3/4 in.	24 – 44 mm	3 – 5-1/4 in.	72 – 132 mm
SIZE F	1-7/8 – 2-1/4 in.	46 – 56 mm	5-3/8 – 6-3/4 in.	138 – 168 mm
SIZE G	2-3/8 – 3-1/4 in.	58 – 80 mm	7-1/8 – 9-3/4 in.	174 – 240 mm

When installing over a splice area, add two sizes to your rope diameter and then select the appropriate DC Moor-Gard size.

WITH Dyneema®

Product Code: 975

Technolene

The construction of Technolene is similar to Dynalene, but the fiber composition is Technora®, an aramid fiber with very high heat resistance. Technolene should be specified where synthetic ropes are subject to both abrasion and high temperatures from reflected heat sources or friction.

FEATURES:

- > Excellent heat resistance for high heat applications/environments
- > Easy inspection without removal
- > Excellent durability and cut resistance

TECHNOLENE SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
SMALL	7/8 – 1-1/4 in.	22 – 30 mm	2-3/4 – 3-3/4 in.	66 – 90 mm
MEDIUM	1-5/16 – 1-5/8 in.	32 – 40 mm	4 – 5 in.	96 – 120 mm
LARGE	1-3/4 – 3 in.	44 – 72 mm	5-1/2 – 9 in.	132 – 216 mm
EXTRA-LARGE	3-1/4 – 4 in.	80 – 96 mm	10 – 12 in.	240 – 288 mm

When installing over a splice area, add two sizes to your rope diameter and then select the appropriate Technolene size.

technora® The Power of Aramid

Superior heat and abrasion resistance in high ambient heat applications.

Excellent protection that allows for easy inspection without removal.

Economical

Permanently sewn configuration or removable "hook and loop" configuration

DuraTech Product Code: 984

DuraTech is a webbed-nylon chafe sleeve. It is available in a permanently sewn configuration or removable "hook and loop" configuration. This chafe sleeve provides an economical, but resilient solution for protecting lines from localized abrasion. The sleeves can be moved and tethered in place. Prefabricated grommets are standard on all sleeves to assure proper installation. The standard length is 10 feet, with longer lengths available by request.

Hook and Loop DuraTech

SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	TO COVER SPLICE AREA (ROPE DIAMETER*) INCHES	TO COVER SPLICE AREA (ROPE DIAMETER*) MILLIMETERS
A	up – 3/4 in.	up to 18 mm	up to 1/2 in.	up to 12 mm
B	7/8 – 1 in.	19 – 24 mm	9/16 – 5/8 in.	14 – 16 mm
C	1-1/16 – 1-1/2 in.	26 – 36 mm	3/4 – 7/8 in.	18 – 22 mm
D	1-5/8 – 2 in.	40 – 48 mm	1 – 1-1/8 in.	24 – 28 mm
E	2-1/8 – 2-1/2 in.	52 – 60 mm	1-1/4 – 1-1/2 in.	30 – 36mm

Sewn DuraTech

SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	TO COVER SPLICE AREA (ROPE DIAMETER*) INCHES	TO COVER SPLICE AREA (ROPE DIAMETER*) MILLIMETERS
F	up to 5/8 in.	up to 16 mm	up to 3/8 in.	up to 9 mm
G	3/4 – 1 in.	18-24 mm	7/16 – 1/2 in.	11 – 12 mm
H	1-1/16 – 1-3/8 in.	26-34 mm	9/16 – 3/4 in.	14 – 18 mm
I	1-1/2 – 1-5/8 in.	36-40 mm	7/8 – 1 in.	22 – 24 mm
J	1-3/4 – 2 in.	44-48 mm	1-1/16 – 1-1/4 in.	26 – 30 mm
K	2-1/8 – 2-1/2 in.	52-60 mm	1-5/16 – 1-3/8 in.	32 – 34 mm
L	2-5/8 – 3 in.	64-72 mm	1-1/2 – 1-3/4 in.	36 – 44 mm

Duratech can be installed on rope as well as on eyes.

Great weight to durability ratio

Great abrasion resistance

Easy to install and remove for replacement or rope inspection

Won't absorb water—floats

Pro-Gard Eye Protector Product Code: 973

(Hook and Loop)

Pro-Gard is constructed of dual-woven fabric layers made with HMPE fiber. The finer inner layer allows the rope to adjust to load, while the thicker outer layer is coated to provide a high coefficient of friction to minimize movement on the contact surface. Lightweight Pro-Gard is easily installed in the field, won't absorb water, and floats. Available in 20", 30", 40", and 50" legs.

PRO-GARD SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
A	3/8 to 5/8 in.	9 – 16 mm	1-1/8 to 2 in.	27 – 48 mm
B	3/4 – 1 in.	18 – 24 mm	2-1/4 to 3 in.	54 – 72 mm
C	1-1/8 – 1-3/4 in.	28 – 44 mm	3-1/2 to 5-1/2 in.	84 – 132 mm
D	1-7/8 – 2-1/2 in.	46 – 60 mm	5-3/4 to 7-1/2 in.	138 – 180 mm
E	2-5/8 – 3-1/4 in.	64 – 80 mm	8 to 10 in.	192 – 240 mm

Pro-Gard Eye Protector is gusseted at the apex for a better fit.

Pro-Gard Rope Protector Product Code: 974

(Hook and Loop)

The hook and loop feature of this product allows this chafe protector to be easily applied over the rope. The standard length is 10 feet, but is available up to 21 feet in length.

Versatile: may be fixed or adjustable

Pro-Moor Product Code: 977

The Pro-Moor product has all of the features of the Pro-Gard product but since it is tubular, is generally installed on the product before it leaves the factory. The standard length is 2 meters.

PRO-MOOR SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
B	1-1/8 – 1-1/2 in.	28 – 36 mm	3-1/2 – 4-1/2 in.	84 –108 mm
C	1-5/8 – 2 in.	40 – 48 mm	5 – 6 in.	120 –144 mm
D	2-1/8 – 2-1/2 in.	52 – 60 mm	6-1/2 – 7-1/2 in.	156 –180 mm
E	2-5/8 – 3 in.	64 – 72 mm	8 – 9 in.	192 –216 mm

Economical

Durable

Able to adjust or fix to rope

IFH Chafe-Gard Product Code: 999601

IFH (Inverted Fire Hose) Chafe-Gard protects your mooring lines from chock wear. Composed of a tubular braided polyester structure externally coated with a highly wear-resistant rubberized compound. The polyester lining allows mooring lines to adjust under tension while the rubberized exterior's high coefficient of friction minimizes the rope's movement on the chock. Grommets at each end allow attachment of control lines. The standard length is 8 feet.

IFH SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
A	1-1/8 – 2 in.	28 – 48 mm	3-1/2 – 6 in.	84 –144 mm
B	2-1/8 – 3 in.	52 – 72 mm	6-1/2 – 9 in.	156 –216 mm

An inexpensive, durable choice that can be installed as a fixed or adjustable chafe solution.

Durable

Economical

Cordura® Chafe Protector Product Code: R6

Cordura Chafe Protector is a woven product that is produced in a tube format. Cordura is 100% industrial nylon with twice the abrasion resistance of normal nylon and three times the abrasion resistance of polyester. This product is commonly added to the eyes of working lines and can be installed on the rope as well. Available in any length.

Cordura SIZE	FITS ROPE DIAMETER* INCHES	FITS ROPE DIAMETER* MILLIMETERS	FITS ROPE CIRCUMFERENCE INCHES	FITS ROPE CIRCUMFERENCE MILLIMETERS
2 in.	3/4 – 1 in.	18 – 28 mm	2-1/4 – 3-1/2 in.	54 – 84 mm
3 in.	1 – 1-1/2 in.	30 – 36 mm	3 – 4-1/2 in.	90 – 108 mm
4 in.	1-5/8 – 2-1/8 in.	40 – 52 mm	5 – 6-1/2 in.	120 – 156 mm
5 in.	2-1/4 – 2-5/8 in.	56 – 64 mm	7 – 8 in.	168 – 192 mm
6 in.	2-3/4 – 3-1/4 in.	72 – 80 mm	9 – 10 in.	216 – 240 mm
8 in.	3-5/16 – 4 in.	82 – 98 mm	10 – 12 in.	240 – 288 mm
10 in.	4-1/8 – 4-5/8 in.	100 – 114 mm	12-1/2 – 14 in.	294 – 336 mm

Chafe Protector can be installed on rope as well as on eyes.

Rope Hardware

Thimbles are designed to protect the rope's eye from cuts and kinking. Samson can supply thimbles in plastic, galvanized steel, bronze, stainless steel or painted steel. The application will determine the appropriate thimble to be specified.

Since thimbles are not designed for load carrying purposes, they are not load rated either by their manufacturers or by Samson. Certification of thimbles is not standard practice, and Samson does not provide ratings for thimbles used in our rope systems.

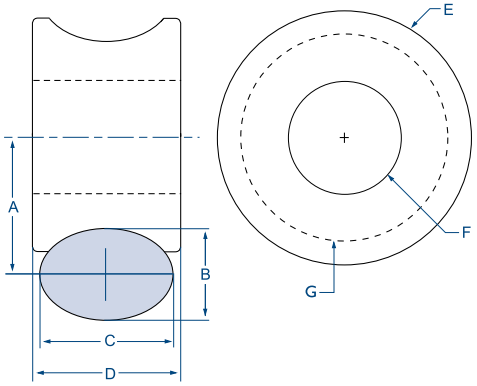
Orkot® Thimble

Product Code: 963

The Orkot® Thimble is a means of attaching synthetic ropes to wire ropes via a shackle. Products made from Orkot® Marine composite materials have exceptional wear resistance and virtually no swell in water, which provides dimensional stability. They offer tolerance to edge loading and misalignment even with the heaviest loads, and are particularly suited to freeze fitting without the danger of shattering. Orkot® TLM Marine is the standard grade of material incorporating a woven-fabric reinforcement and solid lubricants within a thermosetting resin matrix. The material can be used in conjunction with water and grease lubrication, and can be run dry for limited periods.

ROPE Size Range DIAMETER INCHES	ROPE Size Range DIAMETER MILLIMETERS	ROPE Size Maximum CIRCUMFERENCE INCHES	ROPE Size Maximum CIRCUMFERENCE MILLIMETERS	ORKOT BUSHINGS Stock #	SHACKLE Size INCHES	SHACKLE Pin Diamter INCHES	SHACKLE Jaw Winch INCHES	Working Load Limit* TONS
7/8 in.	22 mm	2-3/4 in.	66 mm	SSB–6	**7/8** in.	1 in.	1.4 in.	**6.5** tons
1 in.	24 mm	3 in.	72 mm	SSB–8	**1** in.	1-1/8 in.	1.7 in.	**8.5** tons
1-1/8 in.	28 mm	3-1/2 in.	84 mm	SSB–9	**1-1/8** in.	1-1/4 in.	1.8 in.	**9.5** tons
1-1/4 in.	30 mm	3-3/4 in.	90 mm	SSB–12	**1-1/4** in.	1-3/8 in.	2.0 in.	**12.0** tons
1-3/8 in.	34 mm	4-1/4 in.	104 mm	SSB–13	**1-3/8** in.	1-1/2 in.	2.3 in.	**13.5** tons
1-1/2 in.	36 mm	4-1/2 in.	108 mm	SSB–17	**1-1/2** in.	1-5/8 in.	2.4 in.	**17.0** tons
1-3/4 in.	44 mm	5-1/2 in.	132 mm	SSB–25	**1-3/4** in.	2 in.	2.9 in.	**25.0** tons
2 in.	48 mm	6 in.	144 mm	SSB–35	**2** in.	2-1/4 in.	3.3 in.	**35.0** tons
2-1/2 in.	60 mm	7-1/2 in.	180 mm	SSB–55	**2-1/2** in.	2-3/4 in.	4.1 in.	**55.0** tons
3 in.	72 mm	9 in.	216 mm	SSB–85	**3** in.	3-1/4 in.	5.0 in.	**85.0** tons

*Working Load Limit: The working load limit included the combination of all applied loads, static and dynamic, based on normal service.
The WLL does not represent the loss of strength in the bushing or rope due to creep and other mechanical, chemical and environmental factors.



ORKOT BUSHING STOCK #	A INCHES	B INCHES	C INCHES	D INCHES	E INCHES	F INCHES	G INCHES
SSB-6	1.38 in.	0.88 in.	1.19 in.	1.32 in.	2.31 in.	1.0150 in.	1.88 in.
SSB-8	1.56 in.	1.00 in.	1.44 in.	1.56 in.	2.53 in.	1.1625 in.	2.12 in.
SSB-9	1.75 in.	1.13 in.	1.56 in.	1.69 in.	2.94 in.	1.2650 in.	2.37 in.
SSB-12	1.94 in.	1.25 in.	1.66 in.	1.84 in.	3.25 in.	1.4000 in.	2.63 in.
SSB-13	2.13 in.	1.38 in.	1.88 in.	2.06 in.	3.56 in.	1.5250 in.	2.88 in.
SSB-17	2.31 in.	1.50 in.	2.00 in.	2.19 in.	3.88 in.	1.6500 in.	3.12 in.
SSB-25	2.75 in.	1.75 in.	2.38 in.	2.63 in.	4.63 in.	2.0630 in.	3.75 in.
SSB-35	3.13 in.	2.00 in.	2.75 in.	3.00 in.	5.25 in.	2.3130 in.	4.26 in.
SSB-55	3.88 in.	2.50 in.	3.63 in.	3.88 in.	6.50 in.	2.8130 in.	5.26 in.
SSB-85	4.63 in.	3.00 in.	4.50 in.	4.75 in.	7.75 in.	3.3130 in.	6.26 in.

Nylite Assemblies

SPOOLS, SHIELDS, AND SHACKLE ASSEMBLY

Easily installed into or removed from a premade soft eye. Nylite spool is only 1/7th the weight of steel. Connectors will not deform or rupture from repeated loadings. The shackle takes advantage of the high-strength Nylite connector and synthetic rope.

WORKING DETAILS

- Working loads listed are in tons (2,000 lb).
- Working loads, as given, are based on pin-bore relationship provided by use of the Nylite Shackle. When using a nonstandard pin, the working load as given DOES NOT APPLY.
- The HP aluminum spool is available for use with high-performance Class II ropes in sizes -1 through -5.
- Aluminum spools are not recommended for continuous use in submerged marine environments.
- All working load values are based on a 4:1 safety factor.
- Assembly ratings are based on the use of designated spools and shackles. Spools used in conjunction with other hardware are not rated by Samson.

NYLITE SHIELDS Product Code: 969

Nylite shields are designed for use with specific rope, spool, and shackle sizes. See chart below for information.

NYLITE SPOOLS

Product Code: 969

HP Aluminum Spool *(sizes -1 to -5)*

Nylite Spool *(sizes -1 to -9)*

NYLITE SHACKLES

Product Code: 961

The working load limit (WLL) is stamped on each shackle.

For use with Nylite sizes -6 to -9

For use with Nylite sizes -1 to -5

CLASS I ASSEMBLY *Nylite Assembly with Nylon Spool*

Shackle Type	Size	Shield Color	Fits Rope Diameter MIN.	Fits Rope Diameter MAX	Fits Rope Circumference MIN.	Fits Rope Circumference MAX	Samson Minimum Eye Size INCHES	Product Code	Assembly Working Load TONS	Weight Each POUNDS	Fits Rope Diameter MIN.	Fits Rope Diameter MAX	Fits Rope Circumference MIN.	Fits Rope Circumference MAX	Samson Minimum Eye Size MM	Working Load TONS	Weight Each KG
Zinc Plated	-1	Blue	3/8 in.	1/2 in.	1-1/8 in.	1-1/2 in.	2-3/16 in.	964-0320	1.1 tons	0.5 lb	10 mm	13 mm	29 mm	38 mm	56 mm	1.1 tons	0.2 kg
Zinc Plated	-2	Red	9/16 in.	5/8 in.	1-3/4 in.	2 in.	2-3/4 in.	964-0400	1.6 tons	1.0 lb	14 mm	16 mm	44 mm	51 mm	70 mm	1.6 tons	0.5 kg
Zinc Plated	-3	Green	3/4 in.	13/16 in.	2-1/4 in.	2-1/2 in.	3-3/4 in.	964-0520	2.5 tons	1.6 lb	19 mm	21 mm	57 mm	64 mm	95 mm	2.5 tons	0.7 kg
Zinc Plated	-4	Orange	7/8 in.	1-1/16 in.	2-3/4 in.	3-1/4 in.	4-7/8 in.	964-0680	4.5 tons	3.8 lb	22 mm	27 mm	70 mm	83 mm	124 mm	4.5 tons	1.7 kg
Zinc Plated	-5	Black	1-1/8 in.	1-5/16 in.	3-1/2 in.	4 in.	6-1/8 in.	964-0840	7.5 tons	6.2 lb	29 mm	33 mm	89 mm	102 mm	156 mm	7.5 tons	2.8 kg
Galvanized	-6	Yellow	1-1/2 in.	1-3/4 in.	4-1/2 in.	5-1/2 in.	7-5/8 in.	964-1120	12.5 tons	19 lb	38 mm	44 mm	114 mm	140 mm	194 mm	12.5 tons	8.6 kg
Galvanized	-7	Black	2 in.	2-1/4 in.	6 in.	7 in.	9-3/4 in.	964-1440	20.0 tons	24 lb	51 mm	57 mm	152 mm	178 mm	248 mm	20.0 tons	10.9 kg
Galvanized	-8	Black	2-1/2 in.	2-5/8 in.	7-1/2 in.	8 in.	11-1/4 in.	964-1680	25.0 tons	38 lb	64 mm	67 mm	191 mm	203 mm	286 mm	25.0 tons	17.2 kg
Galvanized	-9	Black	2-3/4 in.	3 1/4 in.	8-1/2 in.	10 in.	14 in.	964-2080	35.0 tons	64 lb	70 mm	83 mm	216 mm	254 mm	356 mm	35.0 tons	29.0 kg

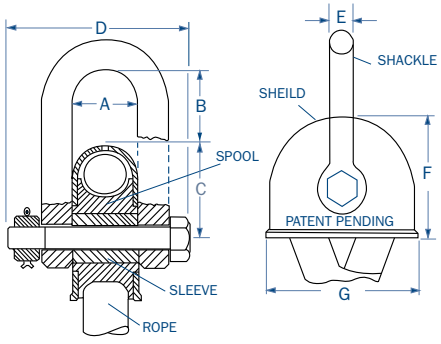
CLASS II ASSEMBLY *Nylite Assembly with HP Aluminum Spool*

Shackle Type	Size	Shield Color	Fits Rope Diameter MIN.	Fits Rope Diameter MAX	Fits Rope Circumference MIN.	Fits Rope Circumference MAX	Samson Minimum Eye Size INCHES	Product Code	Assembly Working Load TONS	Weight Each POUNDS	Fits Rope Diameter MIN.	Fits Rope Diameter MAX	Fits Rope Circumference MIN.	Fits Rope Circumference MAX	Samson Minimum Eye Size MM	Working Load TONS	Weight Each KG
Zinc Plated	-1	Blue	3/8 in.	1/2 in.	1-1/8 in.	1-1/2 in.	2-3/16 in.	964-0321	2.7 tons	0.53 lb	10 mm	13 mm	29 mm	38 mm	56 mm	2.7 tons	1.2 kg
Zinc Plated	-2	Red	9/16 in.	5/8 in.	1-3/4 in.	2 in.	2-3/4 in.	964-0401	4.8 tons	1.06 lb	14 mm	16 mm	44 mm	51 mm	70 mm	4.8 tons	2.3 kg
Zinc Plated	-3	Green	3/4 in.	13/16 in.	2-1/4 in.	2-1/2 in.	3-3/4 in.	964-0521	5.8 tons	1.75 lb	19 mm	21 mm	57 mm	64 mm	95 mm	5.8 tons	3.9 kg
Zinc Plated	-4	Orange	7/8 in.	1-1/16 in.	2-3/4 in.	3-1/4 in.	4-7/8 in.	964-0681	11.5 tons	4.11 lb	22 mm	27 mm	70 mm	83 mm	124 mm	11.5 tons	9.1 kg
Zinc Plated	-5	Black	1-1/8 in.	1-5/16 in.	3-1/2 in.	4 in.	6-1/8 in.	964-0841	14.0 tons	6.78 lb	29 mm	33 mm	89 mm	102 mm	156 mm	14.0 tons	14.9 kg

NEW -1 through -5 shackles are electrolytic zinc coated per ASTM B633-07 SC2 Type II specifications. Sizes -6 through -9 shackles are hot-dip galvanized per ASTM A123 specifications.

Size	Spool Inside Dia.	Spool Outside Dia.	Pin* Diameter	A	B	C	D	E	F	G
-1	**.46** in.	1.50 in.	.44 in.	.88 in.	1.08 in.	1.11 in.	2.41 in.	.38 in.	1.99 in.	2.34 in.
-2	**.58** in.	1.75 in.	.56 in.	1.13 in.	1.21 in.	1.38 in.	3.11 in.	.50 in.	2.38 in.	2.88 in.
-3	**.64** in.	2.25 in.	.63 in.	1.38 in.	1.61 in.	1.77 in.	3.54 in.	.56 in.	3.02 in.	3.70 in.
-4	**.89** in.	3.00 in.	.88 in.	1.75 in.	1.90 in.	2.29 in.	4.70 in.	.75 in.	3.79 in.	4.71 in.
-5	**1.02** in.	3.75 in.	1.00 in.	2.13 in.	2.15 in.	2.85 in.	5.55 in.	.88 in.	4.85 in.	5.95 in.
-6	**1.54** in.	5.00 in.	1.50 in.	2.63 in.	3.14 in.	3.80 in.	7.75 in.	1.37 in.	6.30 in.	7.85 in.
-7	**1.75** in.	6.25 in.	1.63 in.	3.25 in.	3.75 in.	4.80 in.	8.90 in.	1.50 in.	7.93 in.	9.89 in.
-8	**2.00** in.	7.25 in.	1.75 in.	3.75 in.	4.13 in.	5.61 in.	10.13 in.	1.75 in.	9.24 in.	11.47 in.
-9	**2.25** in.	9.00 in.	2.00 in.	4.63 in.	5.06 in.	6.95 in.	12.15 in.	2.00 in.	11.45 in.	14.28 in.

**Sizes -1 to -5 are supplied with jam nuts and cotter pins. Larger sizes have cotter pins and standard nuts.*



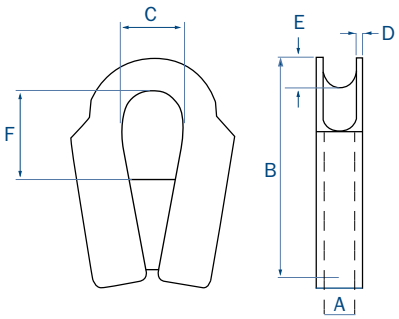
Blue Line Thimble

Product Code: 930

The Blue Line Thimble is compatible with Samson's high-performance, high-modulus synthetic fiber rope products such as AmSteel®-Blue, Force-8, and DPX™-75. The tubular gusseted design creates a high-strength thimble that protects the rope and maintains the proper bending radius when connected to mating hardware.

Stainless Steel

Painted/Powder Coated



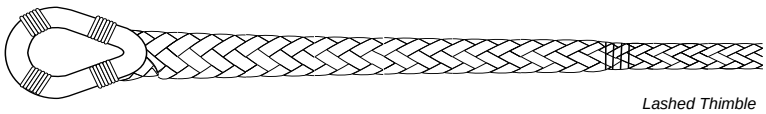
Size Range Diameter INCHES	Size Range Circumference INCHES	Thimble Weight POUNDS	A INCHES	B INCHES	C INCHES	D INCHES	E INCHES	F INCHES	Size Range Diameter MILLIMETERS	Size Range Circumference MILLIMETERS	Thimble Weight KILOGRAMS	A mm	B mm	C mm	D mm	E mm	F mm
3/8 – 7/16 in.	**1-1/8 – 1-1/4** in.	0.8 lb	0.5 in.	3.3 in.	0.9 in.	0.2 in.	0.3 in.	0.9 in.	**9 – 11** mm	**27 – 33** mm	0.4 kg	12 mm	84 mm	23 mm	4.0 mm	8 mm	24 mm
1/2* in.	**1-1/2** in.	1.1 lb	0.6 in.	3.7 in.	1.1 in.	0.2 in.	0.4 in.	1.2 in.	**12** mm	**36** mm	0.5 kg	15 mm	95 mm	27 mm	5.0 mm	10 mm	31 mm
9/16 in.	**1-3/4** in.	1.2 lb	0.7 in.	3.9 in.	1.1 in.	0.2 in.	0.4 in.	1.5 in.	**14** mm	**42** mm	0.6 kg	17 mm	100 mm	27 mm	5.0 mm	10 mm	38 mm
5/8* in.	**2** in.	1.4 lb	0.8 in.	4.4 in.	1.3 in.	0.2 in.	0.5 in.	1.8 in.	**16** mm	**48** mm	0.7 kg	19 mm	112 mm	32 mm	5.0 mm	12 mm	46 mm
3/4 in.	**2-1/4** in.	2.0 lb	0.9 in.	4.9 in.	1.4 in.	0.2 in.	0.6 in.	1.9 in.	**18** mm	**54** mm	0.9 kg	22 mm	125 mm	35 mm	5.0 mm	15 mm	47 mm
13/16 – 7/8* in.	**2-1/2 – 2-3/4** in.	2.8 lb	1.0 in.	5.9 in.	1.8 in.	0.3 in.	0.6 in.	2.4 in.	**20 – 22** mm	**60 – 66** mm	1.3 kg	25 mm	150 mm	45 mm	6.3 mm	16 mm	61 mm
1 in.	**3** in.	3.6 lb	1.1 in.	6.2 in.	1.8 in.	0.3 in.	0.6 in.	2.2 in.	**24** mm	**72** mm	1.6 kg	28 mm	157 mm	45 mm	7.0 mm	16 mm	56 mm
1-1/16* in.	**3-1/4** in.	4.5 lb	1.2 in.	6.7 in.	1.9 in.	0.3 in.	0.7 in.	2.7 in.	**26** mm	**78** mm	2.0 kg	30 mm	170 mm	47 mm	7.0 mm	18 mm	68 mm
1-1/8 – 1-5/16 in.	**3-1/2 – 4** in.	5.8 lb	1.4 in.	7.5 in.	2.4 in.	0.3 in.	0.9 in.	2.9 in.	**28 – 32** mm	**84 – 96** mm	2.6 kg	35 mm	190 mm	60 mm	7.0 mm	22 mm	73 mm
1-3/8 – 1-1/2* in.	**4-1/8 – 4-1/2** in.	7.5 lb	1.8 in.	9.0 in.	2.8 in.	0.3 in.	1.1 in.	3.7 in.	**34 – 36** mm	**102 – 108** mm	3.4 kg	45 mm	228 mm	70 mm	7.0 mm	27 mm	94 mm
1-5/8 – 1-11/16 in.	**5 – 5-1/4** in.	10.3 lb	2.0 in.	10.0 in.	3.0 in.	0.3 in.	1.2 in.	3.8 in.	**40 – 42** mm	**120 – 126** mm	4.7 kg	50 mm	255 mm	75 mm	7.0 mm	31 mm	97 mm
1-3/4 – 2* in.	**5-1/2 – 6** in.	10.8 lb	2.2 in.	10.6 in.	3.2 in.	0.3 in.	1.4 in.	3.9 in.	**44 – 48** mm	**132 – 144** mm	4.9 kg	55 mm	268 mm	80 mm	7.5 mm	35 mm	99 mm

**These sizes also available in stainless steel*

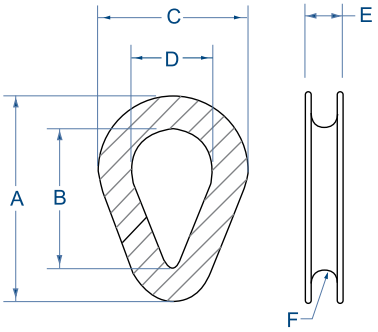
Heavy Duty Hawser Thimble

Product Code: 933

The cast-steel Heavy Duty Hawser Thimble is designed for use with wire rope or high-performance synthetic fiber ropes such as AmSteel®-Blue, Force-8, and DPX™-75.The galvanized thimble provides smooth and even grooves, maximum strength in critical areas, and the proper bending radius for the rope. When used with synthetic ropes, the thimble eye should be lashed at approximately 2, 4, 8, and 10 o'clock on the thimble circumference to secure it to the rope when not in service.



Lashed Thimble



Size Range Diameter INCHES	Size Range Circumference INCHES	Thimble Weight POUNDS	A INCHES	B INCHES	C INCHES	D INCHES	E INCHES	F INCHES	Size Range Diameter MILLIMETERS	Size Range Circumference MILLIMETERS
5/8 – 3/4 in.	**2 – 2-1/4** in.	3.5 lb	6.9	4.5	5.0	3.0	1.2	0.4	**16 – 18** mm	**48 – 54** mm
7/8 – 1 in.	**2-3/4 – 3** in.	6.0 lb	8.6	5.8	6.3	3.8	1.4	0.5	**22 – 24** mm	**66 – 72** mm
1-1/8 – 1-1/4 in.	**3-1/2 – 3-3/4** in.	9.5 lb	10.1	6.8	7.3	4.3	1.7	0.7	**28 – 30** mm	**84 – 90** mm
1-3/8 – 1-1/2 in.	**4-1/8 – 4-1/2** in.	18.5 lb	12.1	8.0	8.8	5.0	2.2	0.9	**34 – 36** mm	**96 – 102** mm
1-5/8 – 1-3/4 in.	**5 – 5-1/2** in.	24.0 lb	12.8	8.0	9.3	5.0	2.4	0.9	**40 – 44** mm	**120 – 132** mm
1-7/8 – 2 in.	**5-3/4 – 6** in.	33.5 lb	14.8	9.5	10.8	6.0	2.7	1.1	**46 – 48** mm	**138 – 144** mm
2-1/8 – 2-1/4 in.	**6-1/2 – 7** in.	53.5 lb	17.1	11.0	12.5	7.0	3.1	1.2	**52 – 56** mm	**156 – 168** mm
2-3/8 – 2-1/2 in.	**7-1/8 – 7-1/2** in.	81.5 lb	19.3	12.8	14.3	8.3	3.9	1.4	**58 – 60** mm	**174 – 180** mm
2-3/4 – 3 in.	**8-1/2 – 9** in.	136.5 lb	24.5	15.0	17.0	9.4	4.9	1.6	**68 – 72** mm	**204 – 216** mm

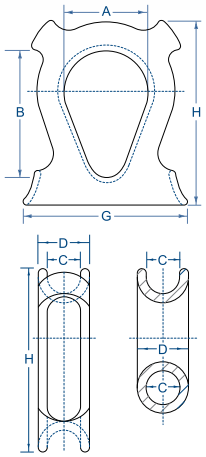
Bronze Thimble

Product Code: 920

Bronze Rope Thimbles are made from a high strength, noncorrosive, nonsparking nickle-aluminum bronze alloy, ideal for marine applications. This rope thimble was developed primarily for use with nylon, manila, polypropylene, and polyvinyl chloride ropes. Four rings or "keepers" secure the rope from jumping out of the thimble. Seventeen sizes are available in rope-diameter sizes from 3/8" to 4-3/4".

Rope Diameter INCHES	Rope Circumference INCHES	A	B	C	D	G	H	T	Shackle Size INCHES	Estimated Weight POUNDS
3/8 – 7/16 in.	**1-1/8 – 1-1/4** in.	7/8 in.	1-1/2 in.	9/16 in.	3/4 in.	2-1/16 in.	2-7/16 in.	3/32 in.	3/8 in.	.2 lb
1/2 – 9/16 in.	**1-1/2 – 1-3/4** in.	1 in.	1-5/8 in.	11/16 in.	29/32 in.	2-3/8 in.	2-13/16 in.	7/64 in.	3/8 in.	.4 lb
5/8 – 3/4 in.	**2 – 2-1/4** in.	1-1/8 in.	2 in.	7/8 in.	1-1/8 in.	3-1/8 in.	3-1/2 in.	1/8 in.	1/2 in.	.6 lb
3/16 – 15/16 in.	**2-1/2 – 2-3/4** in.	1-1/4 in.	2-5/16 in.	1-1/16 in.	1-3/8 in.	3-3/4 in.	4-3/16 in.	5/32 in.	5/8 in.	.9 lb
1 in.	**3** in.	1-5/8 in.	2-3/4 in.	1-3/16 in.	1-9/16 in.	4-1/4 in.	4-11/16 in.	3/16 in.	3/4 in.	1.6 lb
1-1/8 – 1-1/4 in.	**3-1/2 – 3-3/4** in.	1-7/8 in.	3-1/16 in.	1-7/16 in.	1-27/32 in.	5-1/16 in.	5-3/16 in.	13/64 in.	7/8 in.	2.1 lb
1-5/16 in.	**4** in.	2-1/8 in.	3-5/8 in.	1-1/2 in.	1-15/16 in.	5-1/2 in.	5-13/16 in.	7/32 in.	7/8 in.	2.6 lb
1-1/2 in.	**4-1/2** in.	2-3/8 in.	4-1/16 in.	1-11/16 in.	2-5/32 in.	6-1/4 in.	6-1/2 in.	15/64 in.	1 in.	3.7 lb
1-5/8 in.	**5** in.	2-5/8 in.	4-1/2 in.	1-13/16 in.	2-5/16 in.	6-3/4 in.	7-1/16 in.	1/4 in.	1-1/8 in.	4.8 lb
1-3/4 in.	**5-1/2** in.	2-7/8 in.	4-15/16 in.	2 in.	2-17/32 in.	7-3/8 in.	7-3/4 in.	17/64 in.	1-1/4 in.	6.8 lb
2 in.	**6** in.	3-1/8 in.	5-3/8 in.	2-1/4 in.	2-13/16 in.	8-3/8 in.	8-5/8 in.	9/32 in.	1-1/4 in.	7.7 lb
2-1/8 in.	**6-1/2** in.	3-1/2 in.	5-13/16 in.	2-3/8 in.	2-31/32 in.	9 in.	9-1/8 in.	19/64 in.	1-3/8 in.	9.5 lb
2-1/4 in.	**7** in.	3-7/8 in.	6-1/4 in.	2-/12 in.	3-1/8 in.	9-3/8 in.	9-5/8 in.	5/16 in.	1-1/2 in.	11.0 lb
2-5/8 in.	**8** in.	4-3/8 in.	7 in.	2-7/8 in.	3-5/8 in.	10-5/8 in.	10-3/4 in.	3/8 in.	1-5/8 in.	16.5 lb
3 in.	**9** in.	4-7/8 in.	8 in.	3-1/4 in.	4-1/8 in.	11-3/4 in.	12-1/8 in.	7/16 in.	2 in.	25.0 lb
3-1/4 in.	**10** in.	5-3/8 in.	9-1/4 in.	3-1/2 in.	4-1/2 in.	13-1/8 in.	13-7/8 in.	1/2 in.	2 in.	38.0 lb
3-3/4 in.	**12** in.	8 in.	10 in.	4 in.	5-3/8 in.	14-5/8 in.	15-1/2 in.	11/16 in.	-	60.0 lb
4-3/4 in.	**15 – 16** in.	9 in.	12-1/2 in.	6-3/8 in.	8-3/8 in.	22-7/8 in.	21-1/2 in.	1 in.	-	225 lb

Dimensions are approximate — within standard foundry practice.



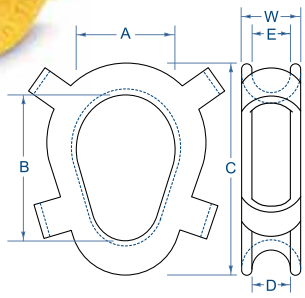
Galvanized Painted Thimble

Product Code: 929

The Galvanized Painted Thimble provides a new dimension in "lightweight" heavy-duty rope thimbles with this improved design for use in the marine towing industry. Light enough for easy handling, but with the maximum high strength at critical points. The generous inside dimensions allow these thimbles to fit any large towing shackle, or any large regular shackle.

Rope Diameter INCHES	Rope Circumferences INCHES	A	B	C	D	E	W	Estimated Weight POUNDS
1-1/8 – 1-1/4 in.	**3 – 3-3/4** in.	2 in.	3-1/2 in.	5-3/8 in.	1-9/16 in.	1-7/16 in.	1-15/16 in.	2.5 lb
1-5/16 – 1-5/8 in.	**4 & 5** in.	3-3/8 in.	5-1/8 in.	7-7/8 in.	1-13/16 in.	1-3/4 in.	2-1/4 in.	5.5 lb
2 & 2-1/4 in.	**6 & 7** in.	3-1/8 in.	6 in.	9-1/4 in.	2-3/4 in.	2-3/4 in.	3-3/8 in.	11.0 lb
2-5/8 in.	**8** in.	4-1/4 in.	6-1/2 in.	11 in.	3-1/8 in.	3 in.	3-3/4 in.	20.5 lb
3 in.	**9** in.	4-3/4 in.	7-5/8 in.	12 in.	3-1/2 in.	3-1/4 in.	4 in.	26.0 lb
3-1/4 in.	**10** in.	5 in.	8-1/2 in.	13-1/2 in.	3-7/8 in.	3-1/2 in.	4-1/4 in.	35.5 lb
3-5/8 – 4 in.	**11 – 12** in.	6 in.	9-1/2 in.	15-1/2 in.	5-3/8 in.	4-1/2 in.	5-1/2 in.	48.0 lb
4-1/4 – 4-5/8 in.	**13 – 14** in.	6-1/8 in.	10 in.	17 in.	5-3/4 in.	5-1/4 in.	6 in.	56.5 lb
5 – 5-1/4 in.	**15 – 16** in.	6-7/16 in.	11 in.	18-1/2 in.	6-1/2 in.	5-3/4 in.	6-5/8 in.	64.0 lb
5-5/8 – 6 in.	**17 – 18** in.	10 in.	11-7/8 in.	24 in.	6-1/2 in.	6-1/8 in.	7 in.	80.0 lb
6-1/4 – 6-5/8 in.	**19 – 20** in.	12 in.	16-1/4 in.	27 in.	8 in.	7-3/4 in.	9 in.	270 lb
7 – 7-1/4 in.	**21 – 22** in.	13-7/8 in.	19-3/4 in.	33-3/4 in.	9-1/4 in.	8-1/2 in.	10-1/4 in.	378 lb

**Note: Can be made of stainless steel or aluminum bronze. Dimensions are approximate—in accordance with standard foundry practices.*
**Note: "D" Dimension is larger than "E" Dimension to allow for the larger after splicing diameter of the rope.*



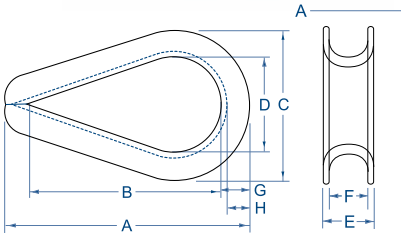
Galvanized HD Wire Thimble

Product Code: 924

The Wire Thimble protects against wear and deformation of the rope eye. Designed with the proper bending radius to maintain rope strength and provide longer service life. This thimble meets the performance requirements of Federal Specifications FF-T-276b Type III (except for those provisions required of the contractor.)

Rope Diameter INCHES	Rope Circumference INCHES	A	B	C	D	E	F	G	H	Weight Per 100 POUNDS
1/4 in.	**3/4** in.	2.2 in.	1.6 in.	1.5 in.	.9 in.	.4 in.	.3 in.	.1 in.	.3 in.	6.5 lb
5/16 in.	**1** in.	2.5 in.	1.9 in.	1.8 in.	1.1 in.	.5 in.	.3 in.	.1 in.	.3 in.	11.8 lb
3/8 in.	**1-1/8** in.	2.9 in.	2.1 in.	2.1 in.	1.1 in.	.6 in.	.4 in.	.1 in.	.4 in.	21.6 lb
7/16 in.	**1-1/4** in.	3.3 in.	2.4 in.	2.4 in.	1.3 in.	.7 in.	.5 in.	.1 in.	.5 in.	34.7 lb
1/2 – 9/16 in.	**1-1/2 – 1-3/4** in.	3.6 in.	2.8 in.	2.8 in.	1.5 in.	.9 in.	.6 in.	.2 in.	.5 in.	51.0 lb
5/8 in.	**2** in.	4.3 in.	3.3 in.	3.1 in.	1.8 in.	1.0 in.	.7 in.	.2 in.	.5 in.	75.7 lb
3/4 in.	**1-1/4** in.	5.0 in.	3.8 in.	3.8 in.	2.0 in.	1.2 in.	.8 in.	.2 in.	.7 in.	158.1 lb
7/8 in.	**2-3/4** in.	5.5 in.	4.3 in.	4.3 in.	2.3 in.	1.4 in.	.9 in.	.2 in.	.8 in.	177.8 lb
1 in.	**3** in.	6.1 in.	4.5 in.	4.8 in.	2.5 in.	1.6 in.	1.1 in.	.3 in.	.9 in.	313.9 lb
1-1/8 – 1-1/4 in.	**3-1/2 – 3-3/4** in.	7.0 in.	5.1 in.	5.9 in.	2.9 in.	1.9 in.	1.3 in.	.3 in.	1.3 in.	400 lb
1-1/4 – 1-3/8 in.	**3-3/4 – 4-1/8** in.	9.9 in.	6.5 in.	6.8 in.	3.5 in.	2.3 in.	1.4 in.	.4 in.	1.3 in.	811 lb
1-3/8 – 1-1/2 in.	**4-1/8 – 4-1/2** in.	9.0 in.	6.3 in.	7.1 in.	3.5 in.	2.6 in.	1.6 in.	.5 in.	1.3 in.	1294 lb
1-5/8 in.	**5** in.	11.3 in.	8.0 in.	8.1 in.	4.0 in.	3.0 in.	1.7 in.	.5 in.	1.4 in.	1700 lb
1-3/4 in.	**5-1/2** in.	12.2 in.	9.0 in.	8.5 in.	4.5 in.	3.5 in.	1.8 in.	.5 in.	1.5 in.	1775 lb
1-7/8 – 2 in.	**5-3/2 – 6** in.	15.1 in.	12.0 in.	10.4 in.	6.0 in.	3.4 in.	2.1 in.	.5 in.	1.7 in.	2775 lb
2-1/4 in.	**7** in.	17.5 in.	14.0 in.	11.9 in.	7.0 in.	3.9 in.	2.4 in.	.6 in.	1.8 in.	3950 lb

** SS-414 sizes available in stainless steel type 304.*



STARLIGHT MARINE SERVICES CASE STUDY

Samson high-performance chafe gear provides protection in the harshest of rope working conditions

Starlight Marine Services, a member of Harley Marine Services' family of companies, operates a fleet of state-of-the-art tugs in the San Francisco Harbor. Starlight vessels are fitted with the latest in deck gear, electronics, and navigation equipment to meet federal and state regulatory standards. All five of the ASD tractor tugs are also fitted with state-of-the-art towing systems: AmSteel®-Blue or Saturn-12, and Dynalene chafe gear.

The chafe gear is applied to the first 20 feet of headline, where the towline receives the most damage from abrasion. This is where the line wraps around a chock and over a bitt onboard the ship. "At times the tug operator has no idea and no control over what odd configuration of steel is inside the ships rail or what the line might be led around when it's out of sight," says Captain Jordan May, of Starlight Marine Services. "Having the added protection of Samson Dynalene allows me to concentrate on the rest of the operation and not worry about cutting the headline when backing full or going indirect and applying a tremendous workload to the line at different angles."

When asked how Dynalene has performed, Captain May replied with enthusiasm: "Shockingly well! In fact, better than most of us onboard the tractors imagined it could. Since we began using the Samson chafe gear on our ship-assist headlines, I would estimate that the number of lines parting behind the eye from cutting and shocking has dropped 30 to 40%."

And when compared with other similar products, May says that "While we have tried other brands, they generally reconfirm why Samson has been the leader in strength and wear over the years. Reliability and consistency are hard to find, but Samson has always achieved both. This is critical to the safety of the tug and its environment when you are working with such high-dynamic loads on the water."

Starlight also knows that working with Samson is about more than the towing system. Along with every purchase comes The Samson Advantage: our commitment to providing the best products and service possible.

"We couldn't be happier with the support and interaction we have received from the Samson team, whether it is flying to Alaska to look at a tug's bullnose and winch, or meeting us at a tradeshow in Holland to discuss ideas." That's The Samson Advantage. That's peace of mind.

For more information on Samson's complete line of high-performance ropes specifically designed for extreme applications, visit our website, ***SamsonRope.com,*** *or contact our customer service department.*

"Our members have been using Samson for as long as Samson has produced cordage," says Capt. Jordan May, Co-Director of the Master of Towing Vessels Association.

The Master of Towing Vessels Association is comprised of 191 tug captains from around the U.S., operating every type of vessel from western rivers pushboats to the latest tractor tugs on the West Coast.

"Having the added protection of Samson Dynalene allows me to concentrate on the rest of the operation and not worry about cutting the headline when backing full or going indirect and applying a tremendous workload to the line at different angles."

"Reliability and consistency are hard to find, but Samson has always achieved both. This is critical to the safety of the tug and its environment when you are working with such high-dynamic loads on the water."

CHAFE GEAR SELECTOR

Chafe Criteria

The chafe gear selector is designed to help you determine which product is suitable for your application based on whether you need sliding or fixed chafe protection, the construction of the rope, and the level of abrasion to which the rope will be exposed. Please confirm your selection with a Samson technical sales engineer or customer service representative.

PRODUCT NAME	SLIDING	FIXED	LIGHT ABRASION		MEDIUM ABRASION		HEAVY ABRASION	
			NON-JACKETED	JACKETED	NON-JACKETED	JACKETED	NON-JACKETED	JACKETED
Dynalene		X	X		X		X	
DC Gard		X	X		X		X	
DC Moor-Gard	X		X	X	X	X	X	X
Technolene		X	X		X		X	
DuraTech	X		X	X	X	X	X	
Pro-Gard Eye Protector	X		X	X	X	X		
Pro-Gard	X		X	X	X	X		
Pro-Moor	X		X	X	X	X		
IFH Chafe Guard	X		X	X	X	X		
Cordura® Chafe Protector	X		X	X	X	X		

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