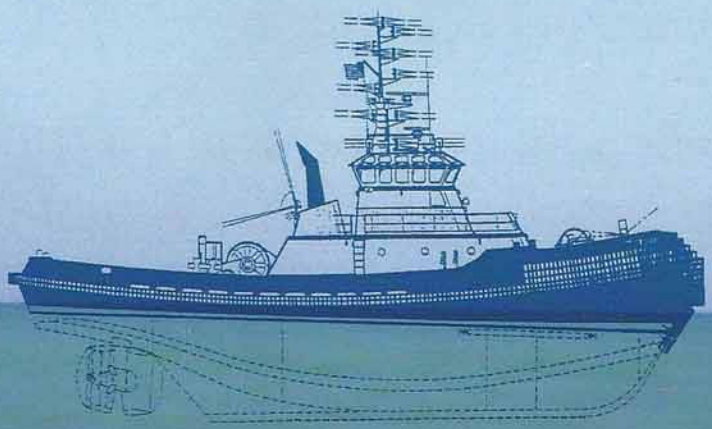
VIKING
MARINE SOUTH

- When Push Comes to Shove Have a Viking on Your Side -



Toll Free: 1-855-862-7463 (VMARINE)
Fax: 1-561-243-4318
E-mail: vikingfender1@yahoo.com

Viking Marine South
2559 Webb Avenue, Suite 5
Delray Beach, FL 33444

Workmanship

Viking's Laminated Mat-Style Fenders are constructed using a 1 1/2" round bar skeletal frame. Nylon reinforced synthetic rubber, sculpted to specific size, is then installed by hand, one at a time onto the skeletal frame.

Hydraulic pressure in excess of ten (10) tons is used to press the treads tight against one another. Ends are then fitted with plate or steel angle.

Weldness steel rings are installed among the treads at strategic points throughout the fender, which are then used to secure the fender to the boat's hull.

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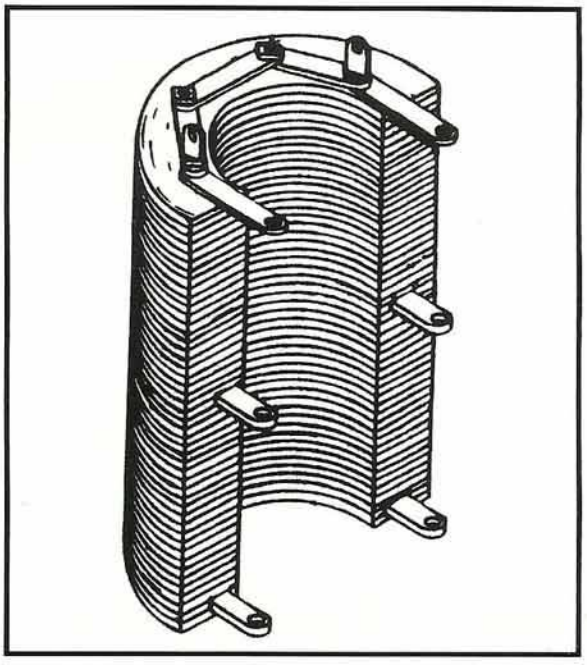
VIKING MARINE SOUTH

Bow Fenders

Bow Fenders are generally considered the most important fender on a tug boat. Viking offers a variety of fenders for the bow, such as the Laminated Bow Mat-Style (described on inside front cover), Laminated Turk's Head, Laminated D-Shape, and Molded and Extruded Rubber Fenders.

- *The Turk's Head is ideal for model bow or tugs with a sharp bow because the laminations run horizontally, preventing the sharp bow from working between the laminations.*
- *The Laminated D-Shape is often chosen because it enables fendering systems to be changed-out in one (1) foot segments, as they are designed to be stacked up one on top of another.*
- *Like the Laminated D-Shape, Molded and Extruded Rubber (available in either D-Shape or Rectangular), is also installed in segments and stacked on top of each other.*

Viking Marine South custom measures and manufactures these bow fenders to fit properly, realizing that lines must work over them without fouling. All of our fenders have their particular advantages. To ensure the best selection to meet your specific needs, please feel free to consult with us before placing your order. Our recommendations for type and size of bow fender will take into account the many facets of each particular situation.



Sidewall Bow Fender

The Sidewall can be used vertically on model bow tugs, plus push knee tugs. They can also be mounted horizontally to cover half-round steel rub rails.

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Bow Fenders

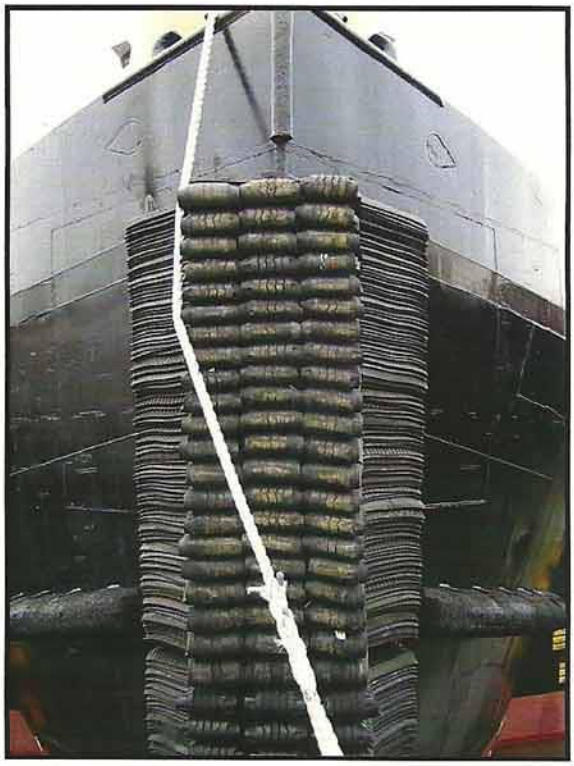
Single-Layer Custom Bow Fender

Our custom-fitted single-layer bow fender is 11" thick and is constructed from durable nylon-reinforced synthetic rubber. This rubber is extremely resistant to ripping and tearing. The rubber laminates are compressed using hydraulic pressure in excess of ten (10) tons.

Double Thick Laminated Bow Fender

Our custom-fitted double-layer bow fender is 22" thick and is constructed from durable nylon-reinforced synthetic rubber. The inner and outer layers are constructed simultaneously. Connections are made using steel plates throughout the entire fender length which are inseparable after constuction.

Bow Fenders



Turk's Head Bow Fender

Is adjustable to fit most model bow tugs and can also be used as a lower bow fender on larger tugs.

D-Shaped Laminated Bow Fender

A very popular choice for bow fendering, very durable, easy to install with built-in mounting brackets. This is an inexpensive solution to your fendering problems.

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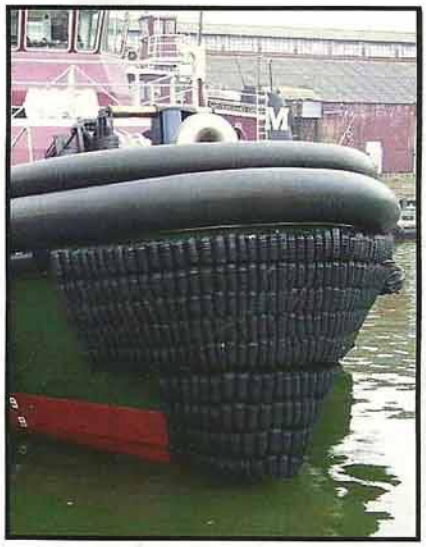

VIKING ENHANCED SOFTLOOP FENDER

When Push Comes to Shove, Have A Viking On Your Side.

- The Softest, Most Forgiving Ship Assist Fender On the Market
- Designed For Greater Energy Absorption And Gripping Ability
- Ideal For Tractor Tugs Bow, Stern And Side Fenders
- Side Hip Fenders For Tug And Barge Units
- Pier Cell Fenders

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Made in USA

Quality Recycled Materials

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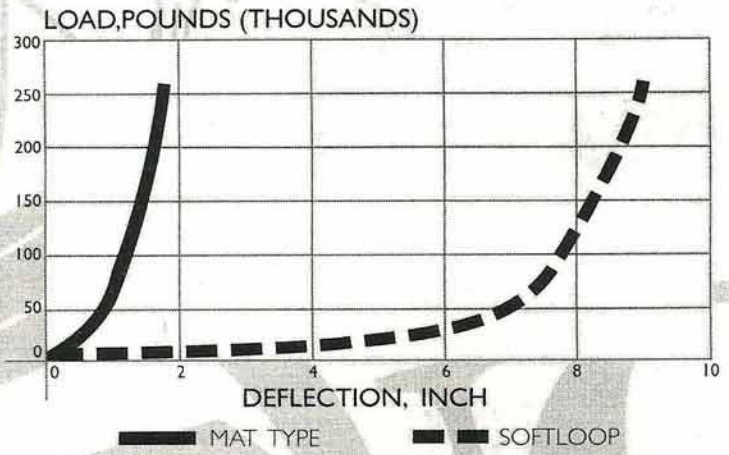
LOAD DEFLECTION/ ENERGY ABSORPTION

Viking Softloop Style Fender vs. Mat Type Fender

Manufacturing Specifications

- Resilient rubber material of fenders shall be manufactured from fabric reinforced truck tires cut to specific size and compressed onto steel supporting rods.
- The finish options for exposed metal parts are black enamel or hot-dipped galvanized.
- For load deflection/energy absorption of the Viking Softloop Fender, see the chart at right.
- Fabric-reinforced rubber sections shall comply with IRHD ASTM D1415 values of 60+-5.

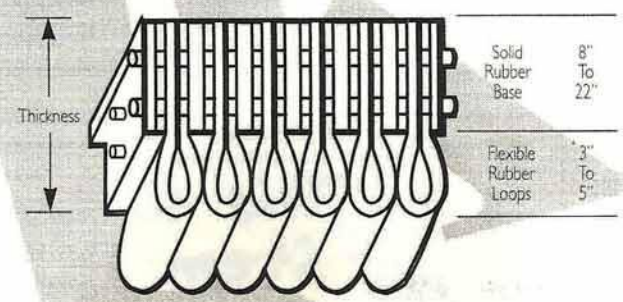
NOTE: MOST OF OUR STANDARD VIKING LAMINATED FENDERS CAN BE PRODUCED WITH THE VIKING SOFT LOOP CHARACTERISTICS.



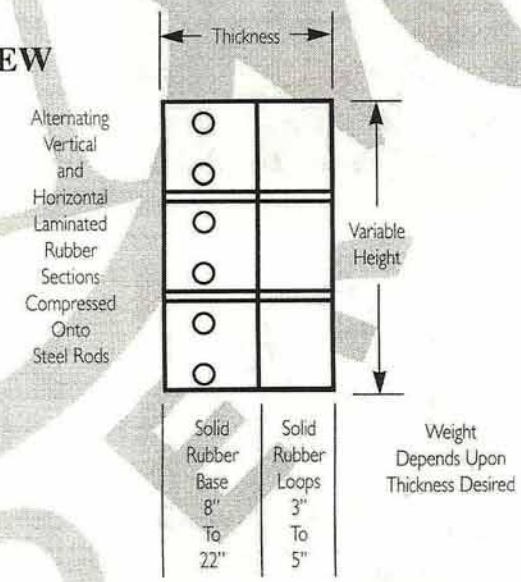
A **VIKING LAMINATED LOOP FENDER**, 2 foot square by 19 inches thick, and a **VIKING LAMINATED MAT FENDER**, 2 foot square by 11 inches thick were submitted for a compression tests. A compressive load was applied to the face of the fender and the deflection recorded. At various intervals the load was removed and the permanent set recorded after a 1/2 hour period of relaxation.

Design Specifications

TOP PLAN VIEW



SIDE VIEW



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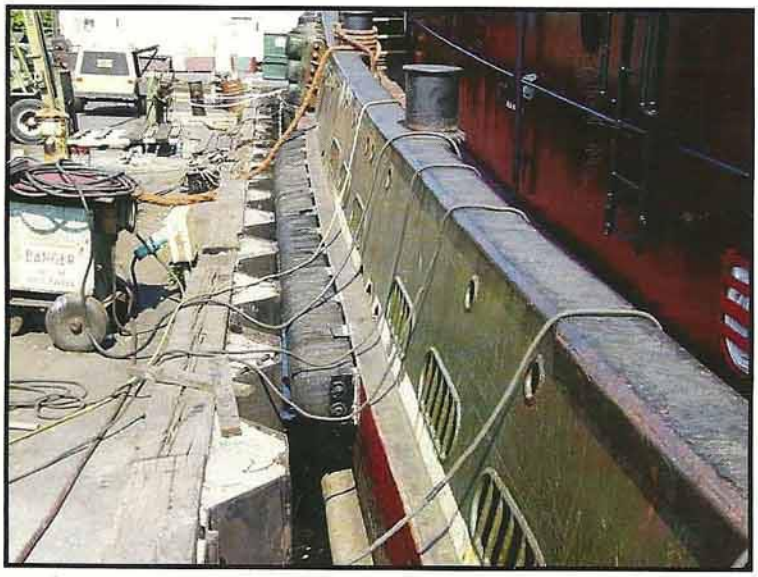
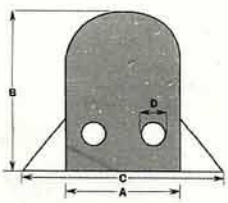
Side Fenders



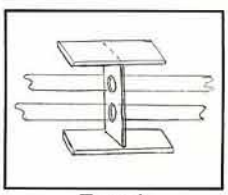
Laminated D-Shape

Allows you to leave the engineering to us. Mounting plates are manufactured into fenders to eliminate the need for chains, shackles, clips, bolts, hole alignment and drilling. SAVES TIME! You simply position and weld the fender. Securing plates can be customized to fit over or between guardrails.

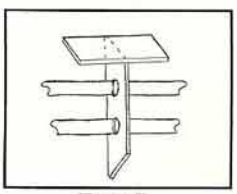


D-Shape Laminated

A	B	C	D
10"	14"	17 1/2"	1 1/2"
10"	12"	17 1/2"	1 1/2"
8"	10"	14 1/2"	1"
6"	8"	11 1/2"	1"


Type A

Optional Mounting Brackets


Type B

Type "B" Block Fenders

Here is a close-up view of the Type "B" Block Fender. The steel angle helps distribute the load evenly along the 1 ½" steel retaining rod. This fender is 24" thick, which allows the tug to work under the rake of the ship without making contact with the wheelhouse of the tug.

Side Fenders

Laminated Sidewall Side Fenders

This fender covers the steel rub rails, and has connecting rings built in every 24" - top and bottom. It is connected to the hull using Sea Gull or U-Clips.

Stern Fenders

Viking offers a variety of stern fenders for both bulwark and waist areas.

Tug owners often wish their fender was longer so the wire wouldn't catch it. Our recommendation for harbor and river tugboats is to fender completely around the stern and far enough up the sides so wires and hawsers can't foul on the forward end of a fender.

In designing stern fenders, Viking ensures that all hardware and rubber do not protrude above the rail where contact could be made with the wire and/or hawser. Viking Sidewall Stern Fenders offer a uniform conical surface that allows wire and lines to slide over it smoothly.

We also locate seams where the wire or hawser has the least chance of fetching up in them.

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Stern Fenders

Sidewall Stern Fender

This fender covers an unusually large rub rail, and has connecting rings built in every 24" - top and bottom. It is connected to the hull using Sea Gull or U-Clips.

Custom Single-Layer Stern Fender

The angular cut of the rubber laminates allow the tow wire to work freely over the fender.

Laminated D-Shaped Stern Fender

Versatility of the D-Shaped fender allows it to be used to wrap the stern. This is a double 12" D-Shape stern fender with mounting clips on 2' centers.

Stern Fenders

D-Shape Custom Corner Fendering

The corners of a crew boat are areas of high impact. Viking "D" fendering helps protect against damage by absorbing and evenly distributing the force of energy.

Softloop Laminated Stern Fender

Viking Enhanced Softloop fender offers the greatest degree of protection. Ideal applications include, tractor tugs, great energy absorption and gripping ability.

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Notch Fenders

Viking Fender has special expertise in Notch Fendering. In this category, the term "Fendering System" is most appropriate because the Bow Fenders work in perfect harmony with the Side Fenders when a tugboat fits properly in a barge. Proper Notch Fendering allows the tug to stay in notch in a more severe sea-way than a sloppy fit would permit, thereby helping the tug to maintain better control.

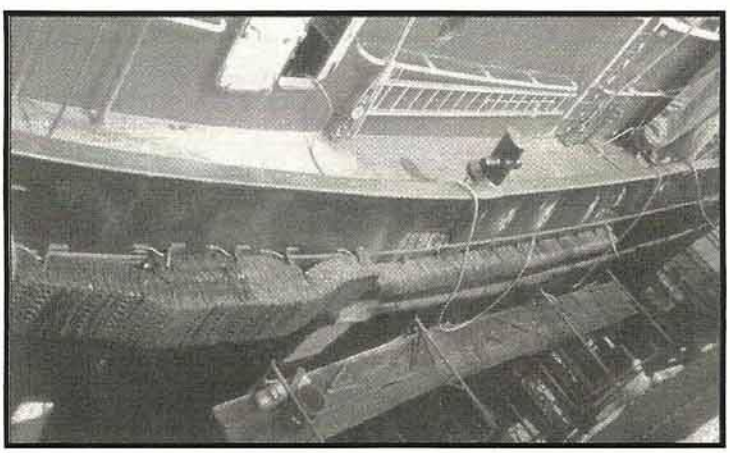
A proper fit doesn't happen by accident, however. Measurements must be taken simultaneously at three (3) different locations because of the dynamic action of the floating objects.

Laminated Notch Side Pads

These fenders are specially designed to fill the space between the tug and the barge Notch. Various thicknesses are available. Viking will take accurate measurements and design a solution to your Notch Fendering needs FREE OF CHARGE.

Laminated Double-Thick Hull Expansion Fender

The outside layer of this fender is longer than the inside layer. This forms a wedge shape, allowing the tug to slip freely into the Notch.



Barge Fenders - Softlite®

Softlite® ionomer foam fenders represent a significant advance over existing materials and designs. The material is a unique polyolefin produced as a resin by EXXON under the name IOTEK® and DUPONT branded. SURLYN®. Because of ionomer's incredible strength, durability and flexibility, bowling pins and golf balls have skins made of this material. Softlite® fenders are made from spirally welded sheets of closed-cell ionomer foam, giving maximum buoyancy with minimal weight and water absorption. Ionomer foam fenders have been supplied to the U.S. Coast Guard, Navy and Army Corps of Engineers for over 15 years. Call Viking Marine South today to see how this fender can work for your company.

Softlite Foam Fenders

Shown here on deployment ramps are fenders measuring 4' x 8'. They are extremely light in weight, yet absorb a tremendous amount of energy and will not deflate.

Softlite Foam Fender shown in this picture with protective cover

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Pilot Solution - Softlite®

Viking Marine South has been solving fender problems for over 17 years, and in those years we have seen it all. Pilot Boats have always been particularly difficult. A few reasons are: type of hull contruction, and concerns of added weight of many rubber fender systems, icing and method of fastening, to name just a few.

Finally, VIKING MARINE SOUTH has solved this problem!!! VIKING SOFTLITE FOAM FENDERING is now available. The use of this remarkable product known as SURLYN or IOTEK is now produced in a foam, soft resilient and extremely strong, not to mention extremely light, hence the name SOFTLITE.

This fender can be bonded to all hull materials, using another remarkable product, casting urethane adhesive. Pioneering this new bonding method of fender attachment has set VIKING apart from other companies.

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Pier Fenders - Softlite®

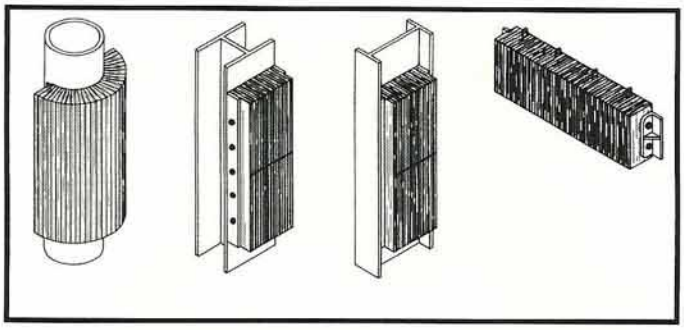
Viking offers laminated rubber, molded rubber, and Softlite® foam fenders for use on piers.

Softloop Laminated Pier Fendering

Modular Fender sections are welded to steel pier support pilings.

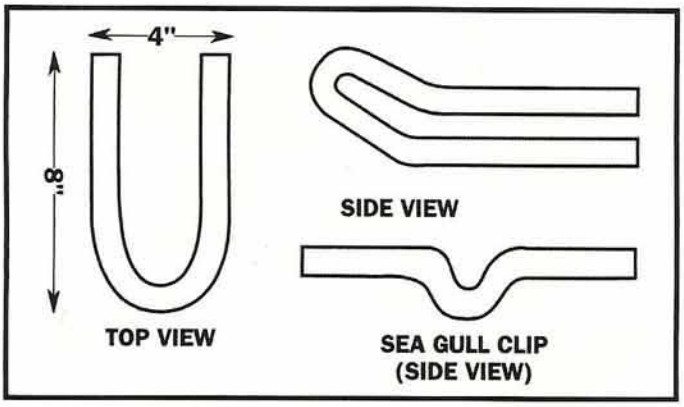
Off Shore Platform Fender Systems

Modular Fender sections are welded to steel pier support pilings.



U-Clips & Sea Gull Clips

Manufactured from 1" round bar steel, U-Clips and Sea Gull Clips are shaped and then welded to the hull to secure the fender. They provide a very strong, long-lasting connection. U-Clips and Sea Gull Clips are used to secure fenders to the hull when limited height space is available.



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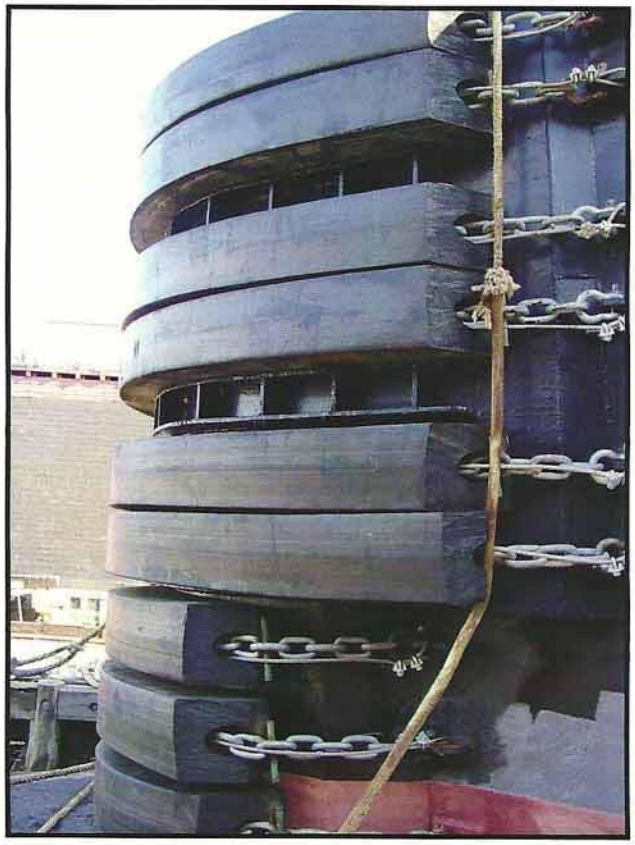
Molded Rubber

There are many service factors that must be considered when determining what type and size for a fender is best for a given application. These include:

- *Type and size of the vessels it will handle*
- *Berthing velocity of the vessels it will handle*
- *Method of berthing*
- *Sea currents and wave actions involved*

Molded Rubber Fenders

These fenders are popular for use on the bow, as well as side and stern. They can be custom molded to fit any hull configuration.



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Since launching in 2002, the ship docking tug, Gramma Lee T., of Moran Towing, New York, has docked close to 5,000 ships using the original set of Viking Marine Enhanced Softoop Fenders. The fenders show normal wear and tear, and the original one-and-a -half inch steel bars are still intact. Moran Towing has no plans to replace these yet.

*Gramma Lee T. built in 2002 by Washburn & Doughty

That's nine years of protection for the Gramma Lee T.

Are you getting the quality you expect from your fenders?

If not, contact Viking Marine.

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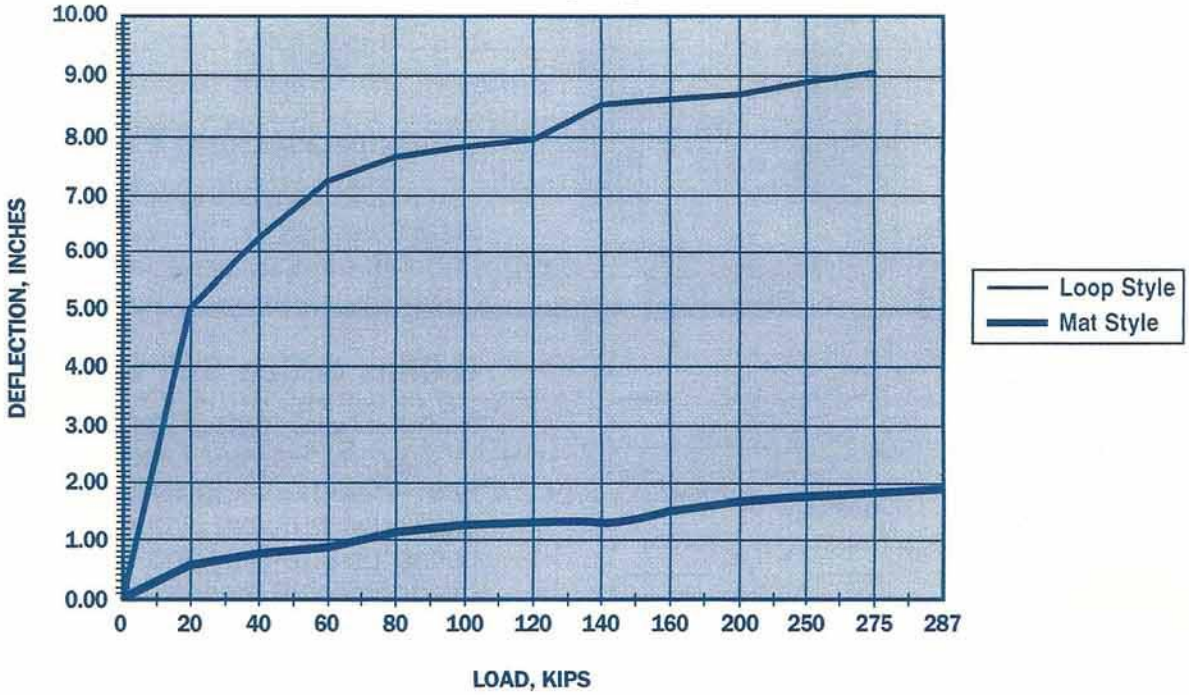
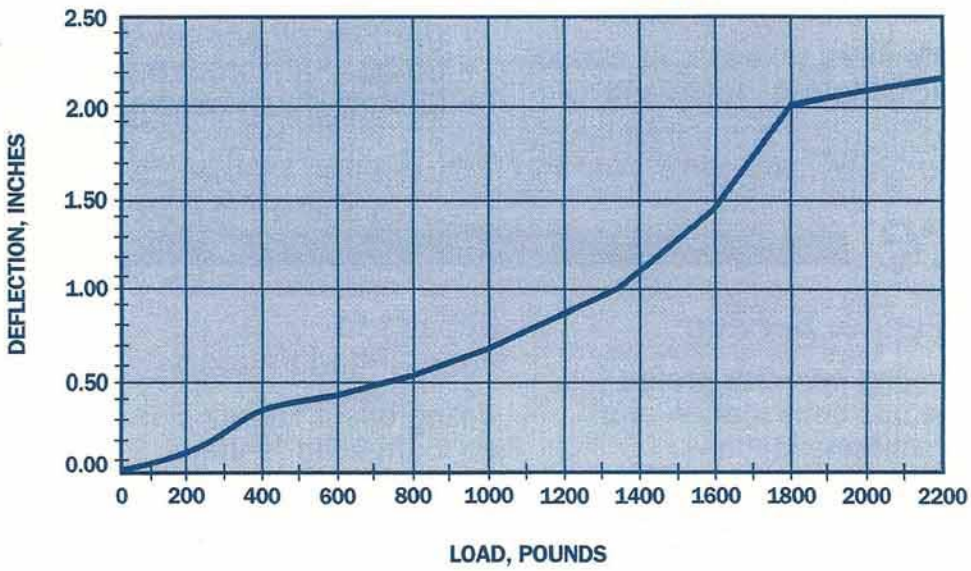
Load Deformation Curves

VIKING FENDERS
Mat vs. Loop Style

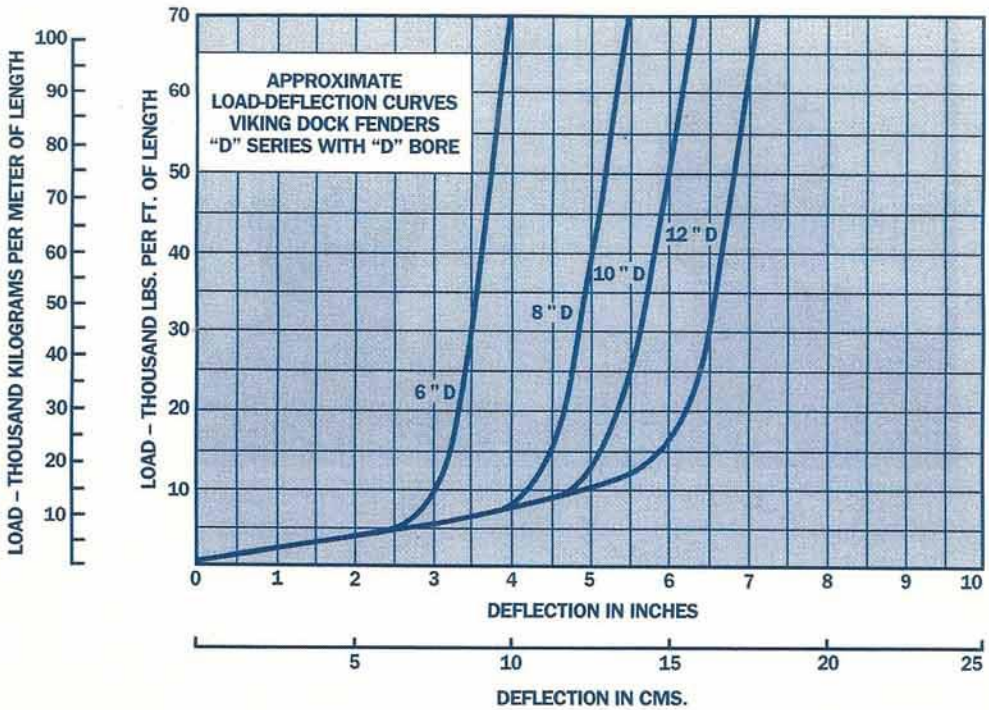


VIKING SOFTLITE FOAM 'D'
Load vs. Deflection Curve

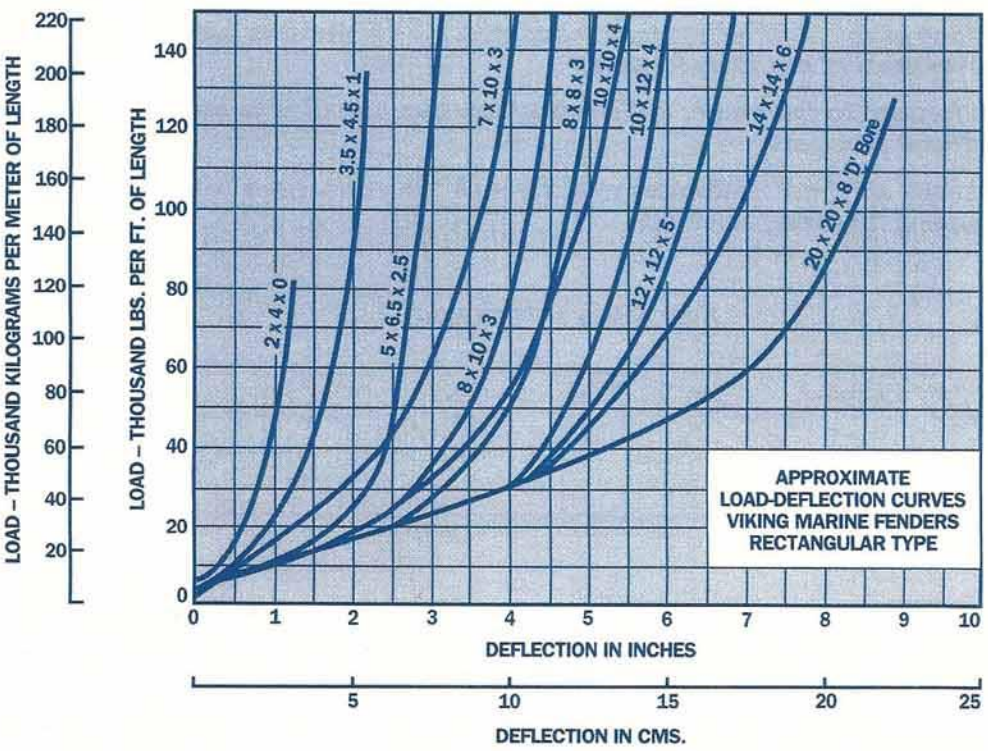


Load Deformation Curves

MOLDED & EXTRUDED RUBBER FENDERS
'D' Fender with 'D' Bore



MOLDED & EXTRUDED RECTANGULAR RUBBER FENDERS
with Round Bore



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