



## Better and safer towing

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The introduction of fiber rope towlines has transformed the towage industry. As tug bollard pull power has increased, larger steel wire rope towlines have become more difficult to handle. At the same time, the number of crew has been declining, leaving the remaining crew with a higher workload when handling towline and mooring lines and connecting and releasing towlines in a timely manner.

High modulus polyethylene, or HMPE, fiber rope is stronger and up to seven times lighter for the same corresponding diameter of steel wire rope, making it easier to handle with fewer crew members.

Typically, a fiber towline configuration consists of a mainline and a pennant and/or stretcher. The pennant is used to protect the main (expensive) towline from early abrasion. In general, the makeup of the towline depends on the tug's bollard pull and its operating methods, the size of towed vessel and number of tugs involved, the dynamic loads that can be expected and whether a winch is used, and local weather/sea conditions.

The pennant and main towline are connected with either a cow-

hitch, spectacle splice or by using connection hardware such as a metal shackle. Strength wise, these all perform well, however, the cow-hitch can be bulky, and a shackle can be hazardous to crew and equipment. Also, disconnecting the mainline from the pennant is a labor-intensive and sometimes even dangerous job.

### Multi-purpose towing

A growing trend for tugs is to fulfill a variety of multi-purpose towing roles. However, different jobs may require alternative towline configurations. Changing the line configuration takes time and effort. A better option would be a single towing line configuration with a customizable weak link that could be used for all vessel tows.

With ongoing developments in fiber rope technology and construction, it is now possible to use a synthetic 'soft shackle' towline connection designed to provide the towing flexibility tug operators are seeking. Soft shackles are usually associated with smaller sailing boat rigging and vehicle towing. These soft shackle designs provide a quick method of connection and disconnection that is fully soft. However, they have relatively poor efficiency and a large bulky knot. Also, the shackle design is unusable



for direct connections between polyester/HMPE lines where the ropes will cut through.

For tug towing, it is possible to retain the benefits of the soft shackle concept while improving the connection efficiency, reducing the knot size for ease of handling and installation, and utilizing a connection design that is suitable to connect polyester and HMPE ropes without the need for protective hardware.

The soft shackle provides tug owners and operators with improvements over existing connections. The smaller knot allows smoother line movement. When connecting a vessel to the towing rope, it makes the whole tow line configuration lighter and softer, therefore easier and safer to handle and enabling quicker connections and disconnections.

Importantly, the soft shackle allows the tug operator to configure the towline with a variable calculated breaking force. It can be designed as either the weakest link or the strongest part.

Finally, with the soft shackle there is a minimal chance of damage to other components such as the towing bit and winch on board the tugboat or ship bollard and, of course, the other lines in the towing configuration.

*Lankhorst Ropes is part of WireCo® WorldGroup headquartered in Prairie Village, Kan. Mark Pieter Frölich is Commercial Director at Lankhorst Ropes USA, a firm specializing in tug and maritime shipping ropes. For more information on soft shackle, he can be contacted on [usa@lankhorstropes.com](mailto:usa@lankhorstropes.com).*



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