

# TerranearPMC Safety Share

Robert Brounstein

## Week of April 2, 2018 – Sling Safety

There are times when a piece of equipment or heavy load needs to be moved; however, the ability to transfer it manually is clearly beyond our physical capability. This is the time when slings and straps can become useful. However, it is nevertheless a critical time as there have been many instances where the wrong slings/straps have been used and therefore, become a potential of failure or the straps recoil, causing serious injury and even fatality.

Nevertheless, the ability to handle materials so that they can be moved from one location to another at the worksite, is vital to all segments of industry. As such, without the proper materials-handling capability, many operations could not be performed.

To varying degrees, many people are tasked to perform materials handling which, therefore, create a potential for injuries when material handling operations are not performed correctly. In fact, the mishandling of materials has been cited by OSHA as a major cause of accidents and injuries in the workplace. Most of these accidents and injuries, as well as the pain and loss of salary and productivity that often result, can be readily avoided. Whenever possible, mechanical means should be used to move materials to avoid employee injuries such as muscle pulls, strains, and sprains. In addition, many loads are too heavy and/or bulky to be safely moved manually. Various types of equipment, have been designed specifically to aid in the movement of materials. These include cranes, hoists, powered industrial trucks, and conveyors.

In one case, the U.S. Department of Labor's Occupational Safety and Health Administration has cited a company that manufactures carbon fiber sailboat rigging for 18 alleged serious violations of workplace safety standards. This happened due to a fatal injury in one of its facilities. The incident involved two employees that were performing work on a rigging cable that had been placed in a test bed and tensioned. During this procedure, a sling holding the cable in place failed, causing the cable to shoot across the room and strike the two workers, one fatally. OSHA found that guards were not used to prevent employees from being struck by the cable. The point is, that when we use slings and other types of straps we are placing substantial tension and upon failure, persons positioned in the immediate "line-of-sight;" become susceptible to being stuck by the strap which, in turn, unleash tremendous force upon a person.

Slings are generally one of six types: chain, wire rope, metal mesh, natural fiber rope, synthetic fiber rope, or synthetic web. In general, use and inspection procedures tend to place these slings into three groups: chain, wire rope and mesh, and fiber rope web. Each type has its own particular advantages and disadvantages. Factors to consider when choosing the best sling for the job include the size, weight, shape, temperature, and sensitivity of the material to be moved, as well as the environmental conditions under which the sling will be used.

Chains are commonly used because of their strength and ability to adapt to the shape of the load. Care should be taken, however, when using alloy chain slings because sudden shocks will damage them. Misuse of chain slings could damage the sling, resulting in sling failure and possible injury to an employee.



# TerranearPMC Safety Share

Chain slings are the best choice for lifting very hot materials. They can be heated to temperatures of up to 1,000° Fahrenheit (538° centigrade); however, when alloy chain slings are consistently exposed to service temperatures in excess of 600° Fahrenheit (316° centigrade), operators must reduce the working load limits in accordance with the manufacturer's recommendations.

Wire rope is composed of individual wires that have been twisted to form strands. Strands are then twisted to form a wire rope. When wire rope has a fiber core, it is usually more flexible but is less resistant to environmental damage. Conversely, a core that is made of a wire rope strand tends to have greater strength and is more resistant to heat damage.

Fiber rope and synthetic web slings are used primarily for temporary work, such as construction and painting jobs, and in marine operations. They also are the best choice for use on expensive loads, highly finished parts, fragile parts, and delicate equipment. Fiber rope deteriorates on contact with acids and caustics. Fiber ropes slings, therefore, must not be used around these substances unless the manufacturer recommends them for that use.

Once a sling material has been selected (based upon the characteristics of the load and the environmental conditions surrounding the lift) and inspected prior to use, the next step is learning how to use it safely. There are four primary factors to consider when safely lifting a load. They are (1) the size, weight, and center of gravity of the load; (2) the number of legs and the angle the sling makes with the horizontal line; (3) the rated capacity of the sling; and (4) the history of the care and usage of the sling.

The rated capacity of a sling varies depending upon the type of sling, the size of the sling, and the type of *hitch*. Machine operators and riggers must know the capacity of the sling. Charts and tables that contain this information are typically available from sling manufacturers. The values given are for new slings. Older slings must be used with additional caution. Under no circumstances shall a sling's rated capacity be exceeded.

Slings must be cleaned prior to each inspection, as dirt or oil may hide damage. The operator must be certain to inspect the total length of the sling, periodically looking for stretching, binding, wear, or nicks and gouges. If a sling has stretched so that it is more than three percent longer than when it was new, it is unsafe and must be discarded. Also, look for other signs of damage including excessive wear, nicks and gouges. These signs indicate that the sling may be unsafe and they also must be removed from service.

More information on the proper use of slings and straps can be obtained in the OSHA regulation 29 CFR 1926.251, "Rigging equipment for material handling."

## **Simplicity is the ultimate Sophistication**

Leonardo Di Vinci

