By Mike Riggs

Tips for Synthetic Sling Selection

Informed decisions prevent disappointment and misapplication

The slings lifting this refinery compressor are shown with cut protection (along bottom with Cornermax Pads) and secondary bearing point/abrasion protection (left sling).

Rigging is changing in this age of ergonomic awareness and concern for an aging workforce. Today, the use of lightweight synthetic slings is more often the rule rather than the exception. But before blindly choosing any synthetic sling, it's important to ask yourself the following questions—the answers to which are critical to the success of the lift. Then, weigh the other benefits as you make your synthetic sling selection.

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Key questions

How will the slings be attached to the load?

The safest and easiest way to attach synthetic slings to a load is by using a shackle to make a positive attachment. However, when the shape, size, or configuration of the load does not allow for a positive attachment, one must know the condition of the load's surface in order to successfully select the correct synthetic sling type.

If the surface is smooth (with no protrusions or edges) then synthetic web or roundslings may be safely used. If the lift requires a basket hitch, then a synthetic roundsling provides more stability to the load. With the endless style of the roundsling, the hitch is able to spread, creating a more stable bearing point for the load. The same result can also be accomplished with a Type 5 (endless) web sling. Yet, the more common Types 3 and 4 eye-and-eye style web slings are limited to a load bearing point equal only to the sling's width.

If the load surface is made of rough concrete or steel, a roundsling is the best choice. However, if web slings are equipped with wear protection, such as sewn-on bulk nylon buffer webbing or removable wear protection, then using a web sling can be an option.

Web slings require this protection because their surface is part of the load-bearing members, which provide the sling with its capacity. Therefore, it must be protected. This protection is not required for roundslings because its cover is not part of the load-bearing portion of the sling. The roundsling is able to protect the load-bearing core yarns from a rough surface. However, when additional wear protection is used with a roundsling, the sling's working life is increased. Roundslings may also be manufactured with a bulk nylon cover rather than the standard double-wall polyester cover. When a bulk nylon cover is used on a roundsling, it must be stated on the sling's identification tag.

Roundslings (blue and green) are a better choice than a web sling (yellow) when headroom is limited.

How much headroom is available?

When there is limited headroom to make a lift, using a web sling is not an option. Web slings may stretch up to 9 percent under load, increasing the headroom required to make the lift. Instead, a roundsling is the best choice in this situation. Roundslings come in two load fiber styles – Polyester or High Performance Fiber (HPF). Polyester roundslings will stretch from 3 to 6 percent under load, while HPF roundslings only stretch from 0.7 to 1 percent, depending on the HPF fiber type.

What protection is needed to safeguard the sling?

Synthetic web and roundslings must be protected from corners, protrusions, rough surfaces and, in some cases, even rigging hardware. Load edges present varying degrees of danger. Remember, what is good for the sharp edge is best for the rounded edge because all edges can cut a sling.

Three different types of mutually exclusive protections are necessary for synthetic slings. Knowing how to protect your slings, you need to determine whether abrasion protection, cut protection, or load protection is needed.

Abrasion protection requires a pad designed specifically to protect from rough surfaces that cause abrasion. Cut protection requires a pad that is not susceptible to cutting either because of toughness or separation. When purchasing cut protection, be sure the protection's load rating is identified on the protection because just as your sling can be overloaded, so can your protection.

Less commonly, there are times when the load must be protected from damage caused by the synthetic sling. Some paints or epoxies may be damaged due to the stretching of a web or roundsling. In this case, protection must be placed between the sling and the load. This protection prevents fragile surfaces from being burned or damaged due to friction or stretching as a load is applied to the sling. For example, a marble statue may need protection from the transfer of the sling's color to its surface while being lifted into place.

Common mistakes made by synthetic sling users

Once you've determined the best style of synthetic sling to use for your application, there is still a learning curve in using these slings correctly. Here is a brief list of the more common mistakes people make.

- **Failing to use protection on all edges**

The most dangerous mistake made by synthetic sling users is incorrectly using abrasion protection pads for cut protection. Though some abrasion (wear) pads provide limited cut protection for the slings, it is very dangerous for the rigger to rely solely on this limited protection to protect the sling from cutting. The second most dangerous mistake with protection is not protecting the sling from all edges of a load, including those that are not the primary load-bearing edges.

- **Attaching metal tags to synthetic slings with wire**

Many times additional information such as an inspection due date, proof test date, or even P.O. numbers must be added to synthetic

Benefits of synthetic slings

Companies that have moved to replace steel slings with synthetic slings have also experienced financial benefits for their efforts. When large wire rope or alloy chain slings have been replaced with HPF roundslings (where applicable), employers also reduce lost-time injuries by reducing the opportunity for pinched fingers, damaged shins, and back injuries.

HPF roundslings also save valuable time when compared to the use of steel slings. There is no match for the increased efficiency, even when taking the time to correctly apply the proper sling protection to the slings. One turbine manufacturer switched to Twin-Path High Performance Fiber slings after spending $300,000 the previous quarter on injury-related costs associated with 3-inch wire rope slings. What this company happily discovered was that they also saved time and labor costs. Previously the company needed four riggers, but was able to do the same job with two riggers. They also no longer needed the use of a forklift, tractor-trailer rig, or mobile crane. This particular job normally took a full eight-hour shift, but with the use of HPF slings, the task was completed in only 2-1/2 hours.

Inventory reduction is another by-product of synthetic slings. Because they are light and flexible, oversized slings can easily do the lifting of smaller loads, reducing the number of slings needed to be maintained in the rigging loft. Likewise, HPF roundslings can reduce the needed inventory of web slings and polyester roundslings. For example, a Slingmax SPXCF1500, which is an HPF roundsling with a vertical rated capacity of 15,000 pounds with a 2-1/2" footprint is flexible and small enough to replace all nylon or polyester web slings through 4-inch, 2-ply capacities. This same sling can also replace polyester roundslings sizes 1 through 5 as rated in ASME B30.9-6.

In this same scenario, if six different sling lengths with four of each size were needed (6', 8', 10', 12', 15' and 20'), a total of 120 different slings would be required to meet the needs of the rigger. However because of an HPF roundsling's small size, flexibility and high capacity, only 24 SPXCF1500 HPF slings would be required to accomplish the same tasks as the 120 polyester roundslings.

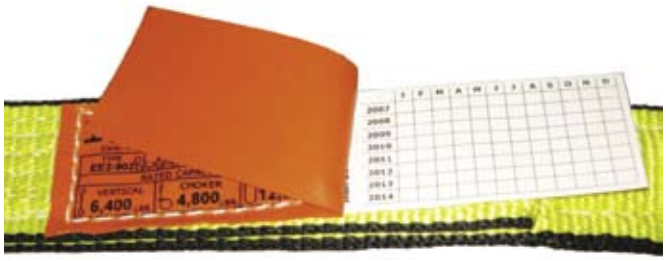
slings. When this is the case, do not attach this information to the sling with wire and metal crimps. Not only can this damage a sling if caught during lifting, but the wire and crimp can also damage a sling to the point that it may be necessary to remove it from service before its first use. Work with your synthetic sling supplier to devise a method of affixing required information on your slings.

• **Requesting an equivalent option in a purchase order**

When users order synthetic slings by giving a part number and then inserting "and/or equivalent" after the number, they are often disappointed. The sling you receive may have a similar capacity but may not offer the same design benefits. For example, if an HPF roundsling rated at 50,000 pounds is ordered, but a heavier polyester roundsling of the same capacity is what is delivered, other features may not have been considered. Among the factors affecting roundsling selection are the fiber type, cover style, inspection systems or double versus single path design. For synthetic web slings the webbing design must be identified clearly or you may be disappointed in the result. Sling webbing may have special coatings, different types of edge toughness or even protection in the eye.

When selecting synthetic slings, take the time to study and understand the types of synthetic slings you use or plan to use so that they can be used safely and to their fullest potential.

A wire and metal crimp was used to add additional information to this web sling. It damaged the eye before the sling was ever used.



This is a correct method for adding information, as designed by a manufacturer and its client.