

By Mike Riggs

# Getting the Most from Round Slings

## Identifying common mistakes and proper techniques



Speaking at the 2008 General Assembly of the Association of Crane & Rigging Professionals (ACRP), Mike Riggs addressed the topic of round sling use and inspection. Excerpts from his presentation are included here. Riggs is the director of training for Slingmax Inc., Aston, Pa. and Knoxville, Tenn.

He is currently president of ACRP. He can be reached at [mriggs@slingmax.com](mailto:mriggs@slingmax.com).

**W**hen choosing a round sling, it's always a good idea to ask the manufacturer what configuration and types of rigging will give you the best results for your application. Round slings come in single, twin, and braided styles and are usually made of strands of polyester fiber. Load-bearing strands may also consist of high-performance or heat-resistant fibers. Double covers are more typical, but single jackets are also available.

One of the most common mistakes riggers make when working with round slings is pairing them with hardware that ultimately damages the sling. ASME B30.9 specifically addresses this, calling for fitting surfaces to be cleanly finished with sharp edges removed to prevent damage to the sling. The forging on a standard shackle, for example, is rough enough that it can damage the cover of the sling. Likewise, ASME B30.9 calls for the fittings to be compatible with the mechanical and environmental requirements of the sling. Therefore, it's important to consider when using shackles to connect two slings that the cover can be cut at the pin connecting point because the sling fibers naturally spread out and become pinched at the sides. Sling protection should be used in these areas of the shackle. It's also a mistake to use shackles designed for web slings when using round slings. Remember, you'll get the highest efficiency if you use hardware made for synthetic round slings. One option is the Crosby Sling Saver product line.



Sling protection at the pin connection point helps prevent slings from becoming cut.

Maintaining appropriate D/d ratios for round slings – just as they are for wire rope slings – is an important consideration. In the absence of an industrywide standard on this issue, ASME B30.9 advises that users follow manufacturer's recommendations for the diameter and width of the bearing surfaces of fittings. However, the reality is that more round slings are destroyed because of cutting than because of D/d ratio issues. Still, it's important to remember that larger pin diameters develop higher sling strength than smaller pin diameters, and the breaking strength

using straight connects is higher than those using curved connections. For additional guidance, refer to WSTDA-RS-1 recommendations for pin diameter requirements for round slings.

Round slings are required by B30.9 to be tagged by the manufacturer. But they must be maintained by the user so as to remain legible. Among the information found on a tag is the manufacturer, code or stock number, rated loads, core, and cover material if it is different than the core material, and number of legs if there is more than one. Replacement of tags must be done by the manufacturer. To extend the life of tags, always try to position the tag so that it is not next to the load or over a hook or attachment point.

### Inspection tips

Even before you put a new sling into use, an initial inspection of the sling is a good idea. One thing to look for is stitching at the cover splice, tag area, or along the seam of non-seamless covers, which may puncture core yarns. This can cause load fiber failure up to 20 percent. If you find that new slings have been stitched in this way, talk to your supplier to correct the issue.



This shows a sling failure due to stitching that punctured core yarns.

Once in use, daily inspections of round slings are required. Users should review the standard for a complete list of specific defects to look for. A few key areas are highlighted here.

Acid or caustic exposure affects different materials differently. For example, nylon may deteriorate and weaken when exposed to certain acids, while polyester may not be affected. Remember that a round sling is made of several components and several different materials, not all of which are necessarily visible.

Acid or caustic exposure affects different materials in different ways.





Like a knot, a looped connection will cause serious loss of capacity.

Users should take notice anytime core yarns are compromised, either by exposure through holes, tears, cuts or wear, and especially if broken or damaged core yarns are found.

A common problem is for round slings to become tied in knots or connected without the use of hardware. While a knot may not seem all that serious, it will contribute to up to 50 percent capacity loss.

Some slings are equipped with Tell-Tails™ or other external warning indicators to help indicate internal damage. A fiber optic tail indicates the condition of an internal core yarn through the continuity of the fiber optic cable. If crushing, cutting, heat or chemical damage has occurred then the damage to the fiber optic cable will destroy its ability to transmit light from one end to the other. When observed, the sling should be sent back to the manufacturer for evaluation.

Another type of indicator, available on Twin-Path® slings, is a Tell-Tail™ that extends past the tag area of the sling. These tails pull inside the sling when there is core damage or severe overload

occurs. However, occasionally incorrect rigging procedures will cause a Tell-Tail to retreat into the sling. Generally, if the tail can be pulled out easily by hand – not with the assistance of tools – the sling is okay. When in doubt, send the sling to the manufacturer to determine if the sling can be repaired.

A similar inspection tool from Slingmax is the CheckFast® external warning indicator. Designed to be a pass/fail system, the indicator will disappear under the cover when damage to the core yarn from fiber-on-fiber abrasion, fatigue, and severe overload occurs.



When one tail is shorter on this Tell-Tail™ system, the Twin-Path® sling does not need to be removed from service. Instead, this indicates the sling paths were folded over each other in a small fitting or the sling was twisted in the bite of a choker hitch during loading.

While round slings offer tremendous advantages in terms of high capacities at relatively light weights, they should be treated with the respect that they deserve. A round sling is unique, unlike any other type of sling. Yet all it takes is a little common sense and proper training to extend the life of a round sling. ■