

Rifled Cover for Round Slings Boasts Strength and Longevity

Slingmax Rigging Solutions, Greensboro, N.C., has patented a method to increase the strength of round slings by 15 percent or more, using the same amount and type of material. Together with Slingmax's K-Spec core yarn and the Slingmax round sling machine, the new rifled cover produces what the company claims is the strongest and lightest round sling available on the market today.

"Round slings are a relatively new type of tension member, and since their introduction to the market the manufacturing process has undergone many improvements,"

explains Dennis St. Germain, Jr., Slingmax vice president. "The most all-consuming question was how to get the most strength and longevity from the core material that is bearing the load. How can you maximize the ultimate strength to weight ratio of the finished product?"

Testing the limits

Since the invention of the round sling, engineers have tried to invent a method to helically form the core bundle inside the protective covers or tubes. Every process that was tried used some form of machinery attached to or in conjunction with the round sling machine itself. Typically, cones of core yarn were arranged on a turntable that rotated to form a larger strand as it was wound inside the cover on a round sling machine.

There were two significant problems with this method to form a helically wound core. One, the rotation of the turntable had to be synchronized with the speed of the round sling machine. Two, the process worked only when there were several cones of core yarn utilized, in essence making higher capacity round slings. For smaller capacity round slings that used only one or two cones of core yarn, it was not effective.

Round slings made with parallel or random length strands do not develop the efficiency

or breaking strength per pound of core fiber as round slings made with the patented rifled tube, according to Slingmax. The company also notes that round slings made with parallel strands will not last as long in cycling tests.

The rifled cover, under development for five years before being patented this year, works like the inside of a rifle barrel where the



Slingmax Rifled Core Technology vs. parallel laid strands

bullet spins as it leaves the muzzle of the gun. This spinning or helical winding of the core yarn significantly improves the breaking strength of the round sling, and fortifies the sling's fatigue resistance, adding to its longevity. A significant feature of the patented Slingmax round sling machine is the non-rotating tail stock which also improves the helical winding process of the core and rifled cover. All three features—the K-Spec core yarn, rifled cover, and Slingmax round sling machine—work together to make the strongest and lightest round sling available today.

Slingmax first tested this new technology by making two identical round slings. One sling was made using a Covermax rifled cover and the other with a standard cover. Both were quality products, but only the Covermax conformed to the company's new patent. The resulting breaking strength of the two slings differed by 17 percent. The rifled Covermax sling broke at 139,000 pounds, while the standard cover sling failed at 118,000 pounds. The helically wound core strands added an extra 21,000 pounds of strength vs. the exact same number of core strands run parallel or random length. Slingmax notes that a chief engineer of a textile company who witnessed the fabrication and testing process, commented, "If I had not seen it with my own eyes I would not have believed it."

Additional testing, involving 20 slings with a catalog breaking strength of 200,000 pounds, further substantiated the benefits of rifling technology. Ten slings used standard covers, and ten, rifled Covermax covers. The

standard cover slings broke at an average of 207,672 pounds, which translates to a 5.2 design factor. The rifled cover slings broke at an average of 244,766 pounds, or a 6.1 design factor. This is an increase in strength of +17 percent or +36,094 pounds per sling. Material and labor are identical for all slings.

Another advantage of this astounding new technology is the consistency of sling breaking strength. The ten slings made with standard covers had a deviation between high and low failure points of 50,000 pounds, from 178,000 to 228,000 pounds. The rifled Covermax slings had a deviation between high and low of only 11,000 pounds, or from 239,000 to 250,000 pounds. Furthermore, the weakest rifled cover sling still broke 11,000 pounds higher than the strongest standard cover sling, reports Slingmax, noting that all 20 slings had an identical amount of strength-bearing core yarn, and all weighed exactly the same.

Excellent results

"We have achieved three major benefits from rifled cover technology," says St. Germain. "First, the slings are 17 percent stronger with the same amount and the same cost of material. Second, in cycle testing they maintain more strength even after 50,000 cycles at a 50 percent overload." A third benefit, adds John Ketchum of Slingmax, is more consistent ultimate sling break strengths.

Combined with another new patent on the Check-Fast inspection system, the technology with Covermax covers provides job sites with the strongest, lightest, most easily inspected sling, says St. Germain. "Safety on the job is greatly enhanced while productivity is improved. Lighter and stronger slings are more easily handled."

Slingmax, which celebrates its 25th anniversary this year, currently has 37 dealers in 11 countries with a total of 42 fabrication, repair, and testing centers. Available now through all Slingmax locations worldwide, the rifled cover technology "has been enthusiastically received by customers who have had the chance to study the advantages," reports St. Germain.

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