

THE Check-FAST™ INSPECTION SYSTEM  
Patent Pending 60/683,987



## TECHNICAL REPORT

November 9, 2005

### Definitions:

**Check-Fast™ Tag:** A ¾” wide by approximately 5” long black tag with continuous silver lettering of Check-Fast™ that extends from the sling cover.

**EWI:** External Warning Indicator – A single 3mm x 3.5” extension of double-braided synthetic cordage that extends from the cover of a roundsling and lays parallel to the identification tag and the Check-Fast™ Tag.

### PURPOSE:

1. SLINGMAX® has been working on an inspection system for roundslings that would give a warning to users for the following conditions:

- Exposure to acid
- Exposure to caustics
- Internal Core Yarn deterioration from fiber on fiber abrasion
- Overloading beyond the proof-test of twice vertical rated capacity
- Heat damage that may cause weakness in the core yarn
- Damage to the sling from crushing or cutting

2. The second goal was to have an effective system that could be installed in roundslings of different constructions, types, and materials including:

- Single-Path roundslings
- Twin-Path® roundslings
- Multi-Path roundslings
- All rated capacities
- Polyester core yarn by SLINGMAX®, Inc.
- K-Spec® core yarn by SLINGMAX®, Inc.
- Any other type of core yarn from Slingmax®, Inc.

3. The third goal was to provide a stationary tag area that would not shift during sling use.

4. Fourth we wanted a solution to the problem of an employee purposefully changing the external warning indicator to give a false reading rendering the sling unfit for service.

5. Another purpose was to provide the end user with a quick and effective means of training employees to carry out inspections of roundsling products that would provide a pass/fail go-no/go outcome. The end result of the Check-Fast™ Inspection system is objective, not subjective.

## SLINGMAX® SOLUTIONS

1. **Exposure to acid:** Early indication of exposure to acid that would potentially cause sling deterioration would come from a visual inspection of the Covermax® nylon outer cover. Nylon will not hold up to acidic conditions.
2. **Exposure to caustics or bases:** This exposure can be visually checked by examining the polyester sewing thread used to stitch Twin-Path® slings along the center line and to close the cover on both single-path and Twin-Path® slings. Polyester is affected by exposure to bases. If a round sling is made using polyester jackets, the sewing thread should be nylon, reversing the process so the same chemicals can be detected.
3. **Internal core yarn deterioration from fiber on fiber abrasion:** The EWI that extends past the sling cover gives a user an indication that the core yarn is wearing from multiple uses when it disappears under the cover. Inside the cover is a sacrificial ring that will fail before the load bearing core yarns are worn from abrasion. This sacrificial ring is attached to the EWI which will move instantly under the sling cover if the ring fails.
4. **Overloading of a sling:** The sacrificial ring attached to the EWI will also fail from severe overload. The sling must be loaded to more than twice the vertical rated capacity before the EWI will be activated. A sling rated at 20,000 lbs would have to experience more than 40,000 lbs for the EWI to activate. When the sacrificial ring fails from overload the EWI will instantly disappear under the sling cover. The EWI can be seen by the riggers while the lift is ongoing giving them time to lower the load if they see it disappear under the cover.
5. **Heat Damage:** Heat damage is indicated by visual inspection of the cover and sewing thread. Melting, charring, weld splatter, and other heat sources will damage the cover and thread before the load bearing core is seriously jeopardized.
6. **Damage from crushing or cutting:** The use of Covermax® nylon covers with a green bulked nylon outer cover and a red inner cover will give visual warning of cover penetration. The contrast between the light outer green and dark inner red covers aids the visual inspection of the sling.
7. **Different Constructions:** The Check-Fast™ inspection system works with any type of roundsling including Single-Path, Twin-Path® and Multi-Path constructions. Every type of round sling contains multiple strands in the core that share equally in the load placed on the sling. The load or wear on the independent sacrificial ring will cause the EWI to disappear before the main body of the core is negatively affected.
8. **Any Capacity Roundsling:** The Check-Fast™ independent sacrificial ring will generate the same result in any capacity roundsling. In a 20,000 lb sling or a 200,000 lb sling the core strands all share the same loading. This may be 312 lbs per strand as an average in either sling or any other rated capacity. To cause a failure in the sacrificial ring each strand would have to be loaded to more than 624 lbs. or more than twice the vertical rated capacity.
9. **Any Type of Core Yarn:** The Check-Fast™ system uses an independent sacrificial ring of similar capacity and chemical composition as the round slings load bearing core yarn; it generates equivalent stretch characteristics. The Check-Fast™ System works with Polyester, K-Spec®, & Aramid, core yarn manufactured by SLINGMAX®, Inc.
10. **Stationary Tag Area:** It is important that any signal given by the EWI be reliable and accurately indicates either overload or wear on the internal fibers of the sling. To do this properly the cover must not be allowed to shift during use which could cover the EWI and give the user a false reading. To achieve this goal the cover is locked in place. The end result is a product that will not give a false reading because of cover shifting.
11. **Sabotage Detection:** Products previously marketed have provided the users with overload indicators referred to as Tell-Tails. Some users purposefully pushed these indicators under the sling covers to falsely indicate an overload condition. When this occurred the slings were determined to be unfit for use and production came to a stand still. It was impossible for the supervisor to determine whether the Tell-

Tails worked properly or were artificially manipulated by a worker. With the invention of the Check-Fast™ system the supervisor can easily detect whether the EWI was purposely manipulated or correctly indicated internal damage. When the EWI disappears under the cover, a pull or tug on the Check-Fast™ tag will determine the answer to this question. If the tag pulls out of the sling cover, the EWI worked properly. If the Check-Fast™ Tag cannot be pulled from the sling cover then the EWI was artificially manipulated by a worker.

12. **Pass/Fail Inspection:** Visual inspection of the Check-Fast™ System to determine if the Check-Fast™ tag and EWI extend past the sling cover will give the user confidence there is no internal damage. Visual inspection of the Covermax® cover and stitching will give the user confidence there is no damage from other elements that could affect the safety of the sling product. The Check-Fast™ System is objective and not subjective meaning that everyone will easily arrive at the same conclusion when inspecting roundslings equipped with this new invention. The time requirement for the education of employees to be trained in the inspection process for roundslings equipped with the Check-Fast™ System is minimal.

### SUMMARY

SLINGMAX® employees worked on the Check-Fast™ system for over twelve months and conducted many experiments. Many finished sling products were pulled to destruction to gain knowledge about the system and proper installation. Written procedures conforming to ISO 9001-2000 were produced with accompanying pictures to show the correct process of installation. Field trials are ongoing with careful monitoring of the products in user hands. Video tapes of testing and fabrication are available for educating SLINGMAX® dealers in all aspects of the system. Training programs are held in Aston, PA or Kernersville, NC.

I have conducted an exhaustive study of all of the available information and am confident that the Check-Fast™ system is the finest available in the world for the objective inspection of all types of roundslings products.

Respectively Submitted,

Dennis St. Germain, CEO



2625 MARKET STREET - P.O. BOX 2423 - ASTON, PA 19014-0423  
(610) 485-8500 - 1-800-TRI-FLEX  
FAX: (610) 494-5835  
SLINGMAX RIGGING SOLUTIONS

## CERTIFICATE OF TESTING

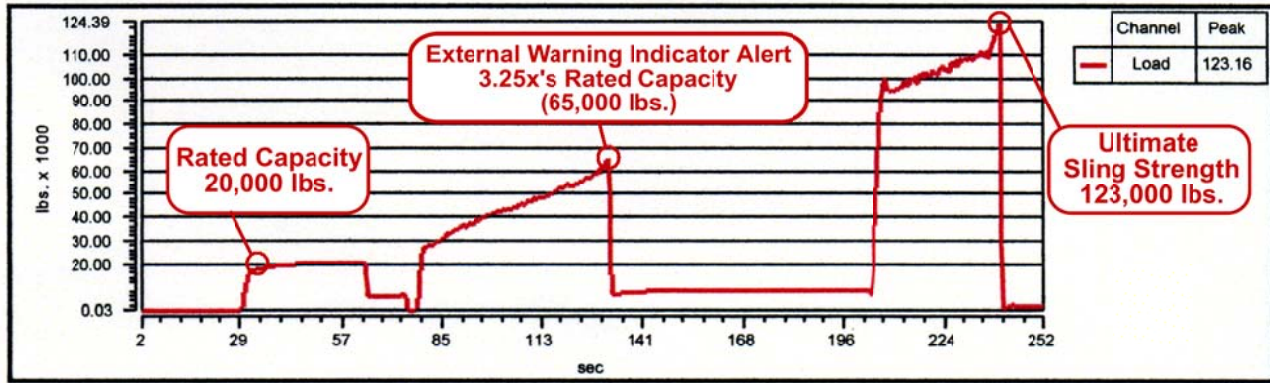
Customer: SLINGMAX

Test ID: 495

Test Date: 9/7/2008 1:49:37 PM

Test Duration: 00:04:11

Serial Number: 9-07-08



Test Conducted By: MARIO COIA

Test #: 081057

Customer: SLINGMAX RIGGING SOLUTIONS

P.O. #: N/A

Description TPXCF2,000

Length: 6 FT

WLL: 20,000LBS

Comments: CHECK-FAST(R) INSPECTION DEMONSTRATION

Signature: Mario Coia

# Single-Path & Twin-Path® High Performance Slings with Check-Fast® System



## Check-Fast® Inspection System

Now available in Polyester or K-Spec® Single-Path and Twin-Path® Roundslings



### Single-Path Extra Covermax® with Check-Fast® Inspection

Single-Path K-Spec® Slings Stock No.	Rated Capacities (Lbs.) 5:1 DF					Approximate Weight (Lbs. per Ft.) (Bearing-Bearing)	Nominal Body Width (Inches)
	Vertical	Choker	Vertical Basket	Basket Hitches			
			90°	60°	45°		
SPXCF 500	5,000	4,000	10,000	8,660	7,070	.34	2.5"
SPXCF 1000	10,000	8,000	20,000	17,320	14,140	.38	2.5"
SPXCF 1500	15,000	12,000	30,000	25,980	21,210	.44	2.5"
SPXCF 2000	20,000	16,000	40,000	34,640	28,280	.52	2.5"
SPXCF 2500	25,000	20,000	50,000	43,300	35,350	.59	3"
SPXCF 3000	30,000	24,000	60,000	51,960	42,420	.65	3"
SPXCF 4000	40,000	32,000	80,000	69,280	56,560	.85	3"
SPXCF 5000	50,000	40,000	100,000	86,600	70,700	.98	4"
SPXCF 6000	60,000	48,000	120,000	103,920	84,840	1.11	4"
SPXCF 7000	70,000	56,000	140,000	121,240	98,980	1.24	4"
SPXCF 8500	85,000	68,000	170,000	147,220	120,190	1.63	5"
SPXCF 10000	100,000	80,000	200,000	173,200	141,400	1.81	5"

DO NOT EXCEED RATED CAPACITY

DO NOT EXCEED RATED CAPACITY

### Twin-Path® Extra Covermax® with Check-Fast® Inspection

PLEASE NOTE: Capacities shown include both paths and are for one complete sling. Sling ratings based on fittings of equal or greater capacity. Conforms to ANSI/ASME B30.9 chapter 6, NAVFAC P-307 section 14.6.4.3, and the Cordage Institute Roundslings Standard.

Twin-Path® K-Spec® Slings Stock No.	Rated Capacities (Lbs.) 5:1 DF					Approximate Weight (Lbs. per Ft.) (Bearing-Bearing)	Nominal Body Width (Inches)
	Vertical	Choker	Vertical Basket	Basket Hitches			
			90°	60°	45°		
TPXCF 1000	10,000	8,000	20,000	17,320	14,140	.40	1.5 - 3"
TPXCF 1500	15,000	12,000	30,000	25,980	21,210	.45	1.5 - 3"
TPXCF 2000	20,000	16,000	40,000	34,640	28,280	.51	1.5 - 3"
TPXCF 2500	25,000	20,000	50,000	43,300	35,350	.57	1.5 - 3"
TPXCF 3000	30,000	24,000	60,000	51,960	42,420	.71	2.0 - 4"
TPXCF 4000	40,000	32,000	80,000	69,280	56,560	.83	2.0 - 4"
TPXCF 5000	50,000	40,000	100,000	86,600	70,700	1.14	2.5 - 5"
TPXCF 6000	60,000	48,000	120,000	103,920	84,840	1.27	2.5 - 5"
TPXCF 7000	70,000	56,000	140,000	121,240	98,980	1.39	2.5 - 5"
TPXCF 8500	85,000	68,000	170,000	147,220	120,190	1.65	3.0 - 6"
TPXCF 10000	100,000	80,000	200,000	173,200	141,400	1.84	3.0 - 6"
TPXCF 12500	125,000	100,000	250,000	216,500	176,750	2.35	4.0 - 8"
TPXCF 15000	150,000	120,000	300,000	259,800	212,100	2.66	4.0 - 8"
TPXCF 17500	175,000	140,000	350,000	303,100	247,450	3.14	5.0 - 10"
TPXCF 20000	200,000	160,000	400,000	346,400	282,800	3.45	5.0 - 10"
TPXCF 25000	250,000	200,000	500,000	433,000	353,500	4.07	5.0 - 10"
TPXCF 27500	275,000	220,000	550,000	476,300	388,850	4.61	6.0 - 12"
TPXCF 30000	300,000	240,000	600,000	519,600	424,200	4.92	6.0 - 12"
TPXCF 40000	400,000	320,000	800,000	692,800	565,600	6.54	7.0 - 14"
TPXCF 50000	500,000	400,000	1,000,000	866,000	707,000	8.15	8.0 - 16"

DO NOT EXCEED RATED CAPACITY

DO NOT EXCEED RATED CAPACITY



Sling can fail if damaged, misused or overloaded. Inspect before use. Damaged sling shall not be used. Use only if trained. Do not exceed rated capacity. Protect sling from being cut by load edges, corners, protrusions and abrasive surfaces. Avoid exposure to acid, alkali and temperature over 180°F. DEATH or INJURY can occur from improper use or maintenance.



## Check-Fast<sup>®</sup> Inspection System

Patent Pending 60/683,987



The Check-Fast<sup>®</sup> System is designed to improve job-site safety. The ✓Fast<sup>®</sup> Tag and External Warning Indicator (EWI) on a roundslings product provides for a pass/fail inspection of the internal load bearing core yarn. Damage to the core yarn from fiber on fiber abrasion, fatigue, and severe overload can be detected. If the sling is mistakenly overloaded beyond rated capacity, the EWI is designed to disappear before the sling fails. The inspector no longer has to feel and squeeze around the entire sling to guess if the core has been severely overloaded. This safety system is available for polyester or High Performance K-Spec<sup>®</sup> Fiber Roundslings fabricated by authorized SLINGMAX<sup>®</sup> Dealers.

## Instructions for Check-Fast<sup>®</sup> Inspection

Patent Pending 60/683,987

Read the information on the sling tag to identify the rated capacity for the hitch to be used, the type of cover and core, the manufacturers' name, and the warnings and instructions on the tag. Be sure the information complies with existing standards.

### Then:

1. Inspect the circumference of the roundslings for holes, tears and other damage to the outer cover. If damage is discovered, take the sling out of service and send it back to your Slingmax<sup>®</sup> dealer for evaluation. **Do not use the sling.**
2. Visually inspect the tag area and ensure the sling is equipped with the Check-Fast<sup>®</sup> Inspection System as evidenced by the black "✓Fast<sup>®</sup>" tag.
3. Visually inspect the tag area for the (EWI) External Warning Indicator. If the EWI is missing or not visible, take the sling out of service and send it back to your Slingmax<sup>®</sup> Dealer for evaluation. **Do not use the sling.**

**SUMMARY:** If there is no damage to the cover and the EWI is visible, the inspection is complete and the sling is a "GO!"

**Order Roundslings with the Check-Fast<sup>®</sup> Inspection System  
from your nearest SLINGMAX<sup>®</sup> Dealer**

**1-800-TRI-FLEX**

**www.slingmax.com**