



**samson**

***THE STRONGEST NAME IN ROPE***

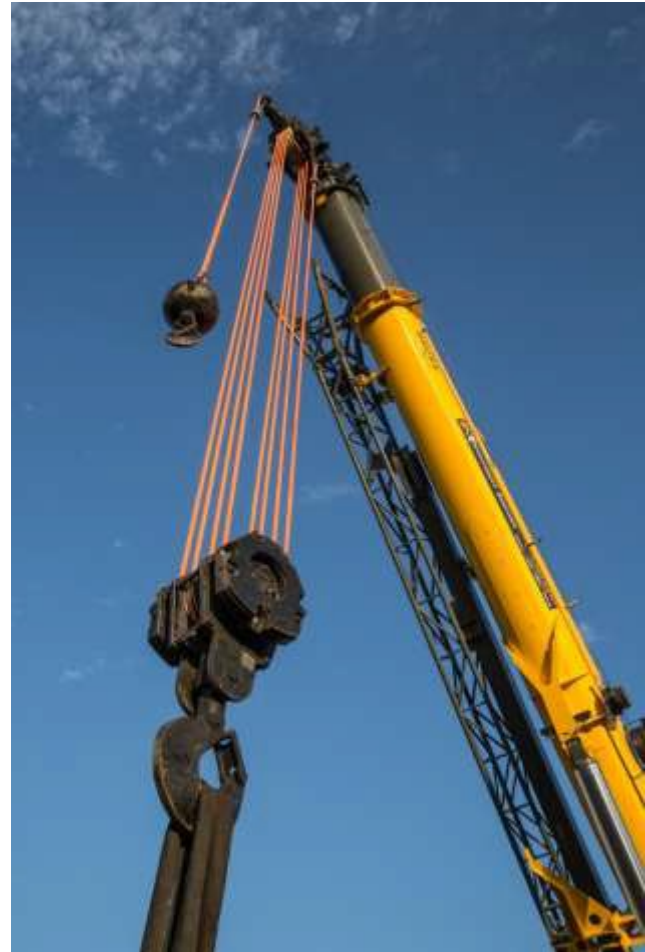
# **KZ™100 Synthetic Hoist Rope Overview**

**March 2015**

# Overview



- **Background**
- **Value Proposition**
- **Testing and evaluation work completed**
- **Path forward**



# Development Project



- **Partners in application development:**

- **Manitowoc – crane technology**
- **Samson – rope and coating technology**
- **DSM Dyneema – fiber technology**



- **3+ years of development and testing efforts**
- **Exclusively available for sale through Manitowoc until October, 2015**

# Why synthetic technology?



## Customers demand superior lifting experience:

- Lightweight equipment for easy handling and transportation
- Increased lift capacity with same footprint
- Improved ROI and jobsite efficiency
- Fun and rewarding crane operation

Lightweight lifting equipment is not an option anymore, but a necessity to remain competitive and meet industry needs

# Redefining Value Proposition



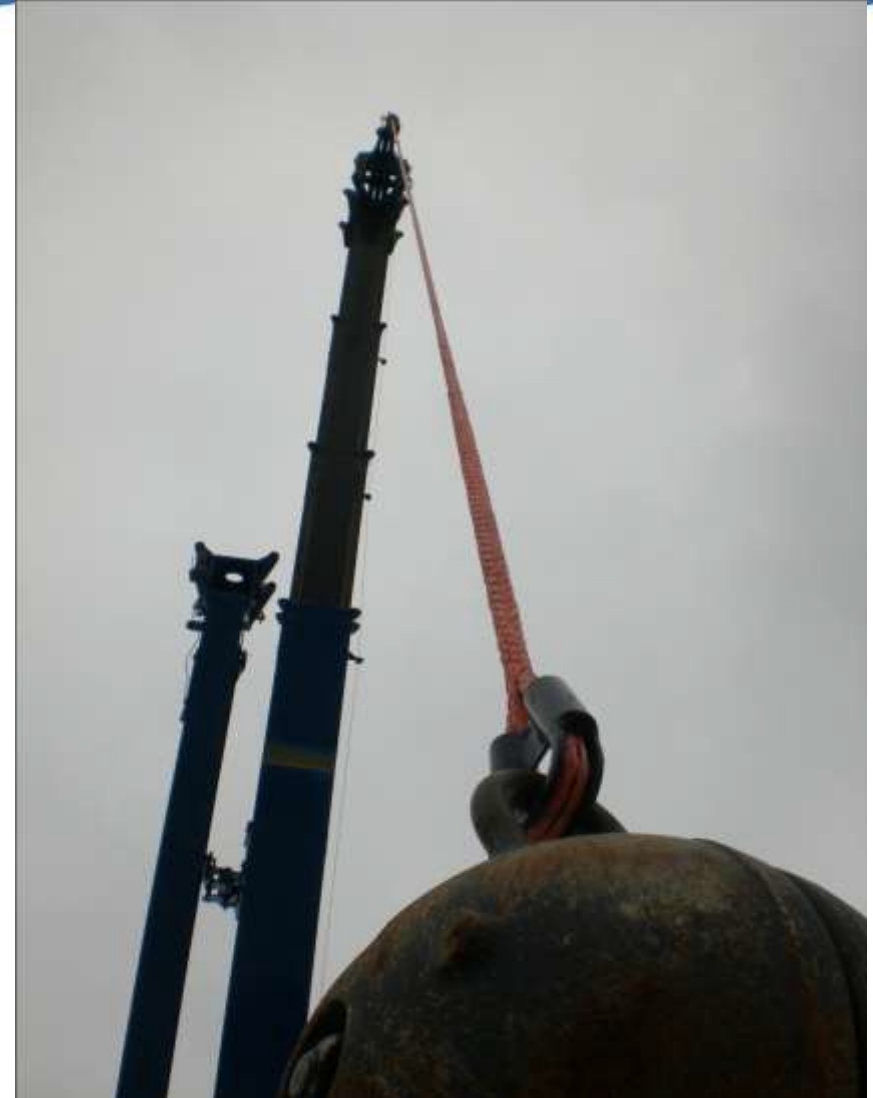
## **Improves jobsite efficiency and reduces the total cost of ownership as follows:**

- **Reduced maintenance cost gets ROI less than 1 year**
- **Resistant to chemical degradation and rusting.**
- **No grease, clean, no broken wires**
- **Reduction of rope replacement due to common damage such as load spin, cabling, bird caging, kinking and diving**
- **Reduced lifting apparatus weight and floor space for installation**
- **80 % lighter weight for easy handling and faster reeving**
- **Good for cold weather package due to increase in strength at -50°C**

# Value Proposition



- **Weight improvements:**
  - *Total system weight*
  - *Overhaul weight, drives sizing for headache balls and hook block cheeks*
  - *Long term lift capacity improvements*
- **Handling:**
  - *Easier to handle/reave*
  - *Becket removal*
  - *Fishhooks that can cut hands*
- **Improve performance in chemical and saltwater environments**



# What is it – KZ™100?



- **Direct replacement in system for steel wire**
  - **Rope Construction**
    - *12 strand external rope*
    - *Control core – maintains cross sectional stiffness to improve winding*
    - *Proprietary coating to improve abrasion and bend fatigue*



# Rope Sizing



- **Diameter is upsized slightly**
  - Size choice is made by strength requirements
  - 5:1 SF
  - 22mm in place of 19mm.
  - 19mm in place of 18mm
  
- **Sheave and Hoist Drum**
  - Use same drum and sheaves
  - Same total length on drum





# Validation Testing



- Spooling
- Crane calibration
- Tensile break
- Tension fatigue testing
- Cyclic bend over sheave (CBOS)
- Elevated temperature
- Accelerated UV exposure
- KZ™100 vs. Wire Rope life cycle
- Operator/Rigger/User at
- Production & field environment
- Test data on cranes & at labs:
  - Testing hrs = 5,105
  - Test cycles = 94,892
  - Length of ropes 31,680 ft (6miles)
- Testing on 7 model cranes
  - RT9130E, RT770E, RT540E
  - TMS600E, GMK4115
  - NBT45, YB7725

# Fatigue, Reliability and Life Cycle



- **Fatigue, Reliability and life cycle testing (Jan,5)= 93,215 cycles**
  - **Tension Fatigue = 50,000 cycles**
  - **Reliability = 36,508 cycles**
  - **Life cycle comparison = 6,707 cycles**



# Pre-production partner (PPP) strategy



- **1,677 total lifts at PPP Facilities (January 2015)**
  - RT9130 at All Cranes various sites
  - RT9130 at Shipbuilding (Newport News, VA)
  - RT770E at H&E (Grove Equip, TX)
  - RT540 at US Navy, (Pearl Harbor-Hickam, Hawaii)
  - YB Industrial Cranes at SEI, PA
  - RT765 at Shady Grove, PA (Manitowoc Facility)
  - RT540 at Niella, Italy (Manitowoc Facility)
  - RT770E at Arizona Power (Four Corners, AZ)



# Path Forward Considerations



## Applicability:

- **KZ™100 has only been tested, qualified, and released for sale on Manitowoc's mobile cranes listed below:**
  - *Full RT product line except RT9150*
  - *NBT40-65*
  - *TMS product line except TMS9000*
- **Product has not been tested on other crane types or manufacturers and is not recommended for sale in those applications.**

# Path Forward Considerations



## Standards:

- **There are no industry standard in place related to synthetic ropes on cranes.**
- **ASME B30.30**
  - *New standard that addresses rope usage and inspection criteria.*
  - *There is a subchapter on synthetics*
  - *Draft has been submitted to main committee for review/comment.*
- **EN/ISO standards**
  - *No activity yet.*
  - *Samson is working with Manitowoc's team for Industry Standards to move this forward.*

# Path Forward - Considerations



## Distribution:

- **Samson will open up sale of the product to distribution – timing and partners still to be determined**
- **Guidelines for distribution still to be determined. Consideration is being given to existing relationships, expertise, geography etc.**
- **At this time, it is the intent of Samson to limit the list of distributors that will have access to the product to ensure proper implementation and scale-up.**

# Information Available



- **On-Line Documents**
  - Product Datasheet
  - FAQ's (Frequently Asked Questions)
- **On-Line Videos**
  - Spooling – high and low load
  - Load spin comparison
  - Installation of hoist rope
  - Fiber to Finish – video tour of manufacturing process
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