



Rope Inspection and Retirement (K-100™)

Any rope that has been in use for any period of time will show wear and tear. Some characteristics of a used rope will not reduce strength while others will. Below we have defined conditions that should be inspected for on a regular basis.

During your inspection you must consider the following before deciding to repair (when possible), downgrade, or retire your rope:

- > the length of the rope,
- > the time it has been in service,
- > the type of work it does,
- > where the damage is, and
- > the extent of the damage.

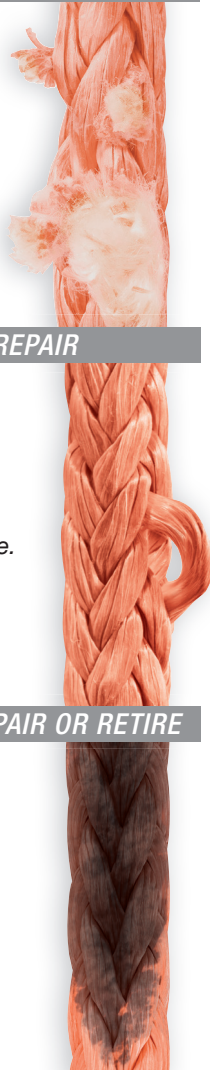
In general, it is recommended that you:

- > Repair the rope, when possible, if the damage is limited only to localized areas.
- > Retire the rope if the damage covers an extended area, or is localized damage that is significant and not repairable.

*REFERENCES Cordage Institute International, *International Guideline CI2001-04, Fiber-Rope Inspection and Retirement Criteria: Guidelines to Enhance Durability and the Safer Use of Rope*, 2004.

Cut Strands: RETIRE

- WHAT** > A 1/2 strand or more is cut
- CAUSE** > Abrasion
> Sharp edges and surfaces
> Cyclic tension wear
- CORRECTIVE ACTION** *Retire the rope.*



Pulled Strand: NOT PERMANENT—REPAIR

- WHAT** > Strand pulled away from the rest of the rope
> Is not cut or otherwise damaged
- CAUSE** > Snagging on equipment or surfaces
- CORRECTIVE ACTION** *Work back into the rope.*

Discoloration/Degradation: REPAIR OR RETIRE

- WHAT** > Fused fibers
> Brittle fibers
> Stiffness
- CAUSE** > Chemical contamination
- CORRECTIVE ACTION** *Contact Samson for chemical contamination details.*

Compression: NOT PERMANENT—REPAIR

- WHAT** > Visible sheen
> Stiffness reduced by flexing the rope
> Not to be confused with melting
- CAUSE** > Fiber molding itself to the contact surface under a radial load
- CORRECTIVE ACTION** *Flex the rope to remove compression.*

Melted/Glazed Fiber: RETIRE

- WHAT** > Fused fibers
> Visibly charred and melted fibers, yarns, and/or strands
> Extreme stiffness
> Unchanged by flexing
- CAUSE** > Exposure to excessive heat
> Proximity to welding
> Friction sliding over fixed surfaces
- CORRECTIVE ACTION** *Retire the rope.*

Inconsistent Diameter: RETIRE

- WHAT** > Flat areas
> Lumps and bumps
- CAUSE** > Broken internal strands/core
> Pulled strands/compression
- CORRECTIVE ACTION** *Inspect to determine cause(s) and address appropriately.*



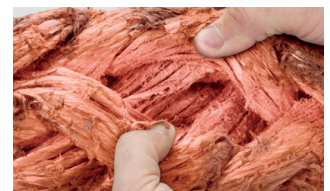
Understanding Abrasion

There are two types of abrasion: internal abrasion caused by the relative movement of internal and external yarns, and external abrasion caused by contact with external surfaces. An unprotected rope moving over a rough surface, such as a poorly maintained sheave can be subjected to both. Upon inspection, it's easy to see that the external strands are abraded by a rough surface: often, fibers can be left behind on the surface that caused the abrasion, and the surface of the rope readily shows abraded yarns.

The same rough surfaces can also cause internal abrasion due to the movement of the internal strands relative to each other. When the rope's surface strands pass over rough surfaces, they are slowed relative to the strands next to them, causing friction. Heat is created from friction—and heat is among the biggest enemies of synthetic ropes.



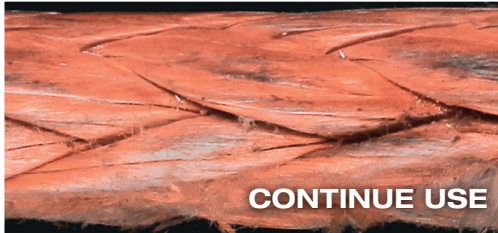
Compare surface yarns with internal yarns.



Inspect for internal abrasion.

This information is based on testing performed by Samson and is provided as a guideline. If you are unsure of the condition of your rope, please contact your Samson representative.

EXTERNAL ABRASION



1

Minimal
Strength
Loss

2

Minimal
Strength
Loss

3

Significant
Strength
Loss

4

Significant
Strength
Loss

5

Severe
Strength
Loss

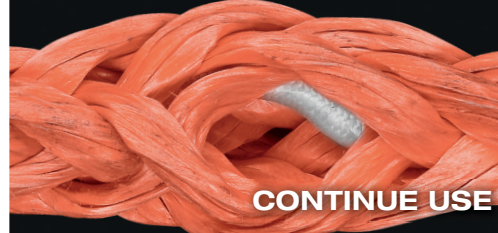
6

Severe
Strength
Loss

7

Severe
Strength
Loss

INTERNAL ABRASION



1

Minimal
Strength
Loss

2

Significant
Strength
Loss

3

Severe
Strength
Loss

Abrasion

REPAIR OR RETIRE

WHAT

- > Broken filaments and yarns

CAUSE

- > Abrasion
- > Sharp edges and surfaces
- > Cyclic tension wear

CORRECTIVE ACTION

Consult abrasion images and rate internal/ external abrasion level of rope. Evaluate rope based on its most damaged section.

■ Minimal strength loss (continue use)

■ Strength loss (consult Samson)

■ Severe strength loss (retire rope)