

## POLYSTEEL™ Certified Safety Lines

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 [cancord.com/product/polysteel-certified-safety-lines/](http://cancord.com/product/polysteel-certified-safety-lines/)

Our Polysteel™ safety lines are manufactured to CSA Z259.2.5. The standard configuration includes a thimble and spliced eye with either a carabiner or snap hook attached at one end and a back splice at the other end. The safety lines can be supplied with alternate CSA Certified hooks attached where required.

- 9,000lb minimum breaking strength
- 16mm (5/8") diameter
- Good UV resistance
- High strength
- Light weight
- Easy handling

\*Breaking strength does not indicate the safe working load of a rope. Please refer to .

Category:

## What are some important precautions when using rope?

[cancord.com/2014/07/14/important-precautions-using-rope/](http://cancord.com/2014/07/14/important-precautions-using-rope/)

Cancord Inc.

7/14/2014

You should be aware that a rope's rated breaking strength is the optimum strength, achieved under laboratory conditions, in accordance with prescribed test procedures, on new rope, pulling at a slow, steady rate in a straight line. Real life applications normally involve many different types of forces and factors which will cause the rope to fail at much reduced loads. Accordingly, the safe working load of any new rope is much lower than its nominal strength. Blanket safe working load (SWL) recommendations cannot be made for any rope because the SWL must always be calculated based on the application, conditions of use, and potential danger to personnel among other considerations. It is recommended that the end-user establish the SWL base on best practices established by the end user's industry, professional judgment, and personal experience in combination with a thorough assessment of all risks. In life threatening and other critical applications, the safe working load should not exceed 1/15 of the nominal strength.



Knots reduce the strength of ropes by as much as 50% by causing the fibers to become distorted and cut into each other. Many of Cancord's ropes can be fitted with swaged terminations which are much more efficient than knots, losing only minimal strength.

Ropes should be kept clean. Dirt and grit inside the rope may cause the inner fibers to be cut or abraded, resulting in a loss of strength. Rope should be washed with a mild detergent in luke warm water and rinsed well. Air dry and avoid hot water.

Running ropes over edges such as roof tops or cliff edges causes abrasion to occur rapidly, and causes a cutting action in the rope. Rope must always be carefully protected at these points. Similarly, protection is required if the rope is being wrapped around angle iron or other structures which will cause the rope to suffer abrasion or cutting action. Ropes should be removed from service when deterioration from abrasion becomes excessive. Cancord sells edge protectors designed to minimize abrasion in such situations.

Shock loads such as those experienced in fall arrest, and or other conditions where the load is applied very quickly, cause damage to the rope. Ropes which have been subjected to this type of force must be removed from service, or downgraded to less critical uses.

Nylon ropes will lose about 10% of their strength when wet and will elongate considerably more. They will regain their strength when properly dried.

Ropes will deteriorate from abrasion, excessive heat buildup, exposure to ultraviolet rays from the sun or from fluorescent lights, and exposure to certain chemicals and their fumes. Dirt will embed itself in the rope and cause the fibers to cut or abrade. Ropes should be stored and used, so as to minimize the effect of these and other damaging influences. Ropes should be checked frequently, and before critical use, for signs of deterioration.

Safe use of ropes requires skill, training, and practice. It is the user's obligation to be qualified to use the ropes & know their limitations. Cancord Inc. guarantees the material and manufacturing of the ropes but accepts no liability for failure due to misuse of any kind, or for use by persons with inadequate training. It is very difficult to judge the safety of used ropes, so it is important to inspect ropes very carefully, and to replace them if there is doubt about their condition.

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Knots reduce the strength of ropes by as much as 50% by causing the fibres to become distorted and cut into each other. Many of our ropes can be fitted with swaged terminations which are much more efficient than knots, losing only minimal strength.

Ropes should be kept clean. Dirt and grit inside the rope may cause the inner fibres to be cut or abraded, resulting in a loss of strength. Rope should be washed with a mild detergent in luke warm water and rinsed well. Air dry and avoid hot water.

Running ropes over edges such as roof tops or cliff edges causes abrasion to occur rapidly, and causes a cutting action in the rope. Rope must always be carefully protected at these points. Similarly, protection is required if the rope is being wrapped around angle iron or other structures which will cause the rope to suffer abrasion or cutting action. Ropes should be removed from service when deterioration from abrasion becomes excessive. Minor abrasion of the cover of Kernmantle ropes will not itself result in a loss of strength, although it may indicate that the inner fibres have been damaged. Where abrasion has penetrated the protective cover and exposed the core, the rope is unsafe for any use, and must be discarded.

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# Rope Science

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## ROPE FIBERS

<h3 style="margin: 0;">Cotton</h3> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">   <small>Natural Fibre</small> </div> <div style="text-align: center;">   <b>Chars at 148°C</b> </div> <div style="text-align: center;">   <b>Very Good</b> </div> </div> <div style="margin-top: 10px;"> <p><b>Chemical Resistance</b></p> <ul style="list-style-type: none"> <li>• Degraded by acids in high concentration or at high temperatures</li> <li>• Resistant to alkalis</li> <li>• Degraded by organic solvents and sea water</li> </ul> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Exceptional Handling</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Susceptible to deterioration from moisture, rot &amp; mildew</li> <li>• Strength can be dramatically affected by basic environmental variables such as the level of humidity</li> </ul> </div>	<h3 style="margin: 0;">Manila</h3> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">   <small>Natural Fibre</small> </div> <div style="text-align: center;">   <b>Chars at 148°C</b> </div> <div style="text-align: center;">   <b>Very Good</b> </div> </div> <div style="margin-top: 10px;"> <p><b>Chemical Resistance</b></p> <ul style="list-style-type: none"> <li>• Degraded by acids in high concentration or high temperature</li> <li>• Degraded by alkalis</li> <li>• Resistant to organic solvents</li> </ul> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Very good creep resistance (gradual elongation under load)</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Poor microbial resistance</li> <li>• Can be rough to handle</li> </ul> </div>
<h3 style="margin: 0;">Polypropylene</h3> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">   <small>Synthetic</small> </div> <div style="text-align: center;">   <b>Melts at 165°C</b> </div> <div style="text-align: center;">   <b>Fair</b> </div> </div> <p><b>Chemical Resistance</b></p>	<h3 style="margin: 0;">Polysteel</h3> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">   <small>Synthetic</small> </div> <div style="text-align: center;">   <b>Melts at 140°C</b> </div> <div style="text-align: center;">   <b>Fair</b> </div> </div> <p><b>Chemical Resistance</b></p>



**Chemical Resistance**

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents, soluble in chlorinated hydrocarbons



**Advantages**

- Light weight
- Inexpensive
- Unaffected by water
- Excellent microbial resistance



**Disadvantages**

- Low strength relative to other synthetic fibers
- Susceptible to creep (gradual elongation under load)



**Chemical Resistance**

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents, soluble in chlorinated hydrocarbons



**Advantages**

- Light weight
- Good handling characteristics
- Unaffected by water
- Higher strength than polypropylene
- Excellent microbial resistance



**Disadvantages**

- Susceptible to creep (gradual elongation under load)

**Nylon**



Synthetic



Nylon 6 melts at 218°C  
Nylon 6.6 melts at 258°C



UV Resistance

Good



**Chemical Resistance**

- Resistant to weak acids
- Degraded by concentrated, strong acids
- Unaffected by most alkalis at room temperature
- Resistant to organic solvents, soluble in phenols and formic acid



**Advantages**

- Good strength
- Excellent microbial resistance



**Disadvantages**

- Susceptible to creep (gradual elongation under load)
- Abrasion resistance of wet nylon is generally poor
- Minor loss of strength when wet; strength is re-gained once rope dries

**Polyester**



Synthetic



Melts at 254°C



UV Resistance

Very Good



**Chemical Resistance**

- Resistant to mineral acids
- Degraded by strong sulphuric acids
- Degraded by strong alkalis at high temperature
- Resistant to organic solvents, soluble in phenols



**Advantages**

- Excellent microbial resistance
- Good strength & durability
- Unaffected by water



**Disadvantages**

- None

**Kevlar®**



Synthetic



Decomposes at 500°C



UV Resistance

Poor



**Chemical Resistance**

- Resistant to weak acids, bases, water & salt water
- Degraded by strong acids & bases in high concentration or high temperature



**Advantages**

- Exceptional strength
- Exceptional heat resistance



**Disadvantages**

- Poor shock loading qualities
- Poor abrasion resistance
- Expensive

**Dyneema®**



Synthetic



Melts at 145°C



UV Resistance

Fair



**Chemical Resistance**

- Acid & alkali resistant.
- Resistant to bleaches, other oxidizing agents and most solvents.
- Unaffected by sea water



**Advantages**

- Good strength
- Unaffected by water



**Disadvantages**

- Susceptible to creep (gradual elongation under load)
- Expensive

**Technora®**



Synthetic



Decomposes at 500°C



UV Resistance

Poor



**Chemical Resistance**

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents

Cancord Inc. is recognized as a leading manufacturer within the industry. Our ongoing investment into the best manufacturing equipment and materials available ensures that we will continue to provide

<ul style="list-style-type: none"> <li>Resistant to sea water and steam</li> </ul> <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>Good strength</li> <li>Unaffected by water</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>Expensive</li> </ul>		<p>that we will continue to provide the distinct quality and service that have become synonymous with our name.</p>
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## Rope Specifications

### COTTON

Natural Fiber, Chars at 148 °C, UV Resistance: Very Good

#### Chemical Resistance

- Degraded by acids in high concentration or at high temperatures
- Resistant to alkalis
- Degraded by organic solvents and sea water

#### Advantages

- Exceptional Handling

#### Disadvantages

- Susceptible to deterioration from moisture, rot & mildew
- Strength can be dramatically affected by basic environmental variables such as the level of humidity

### POLYPROPYLENE

Synthetic Fiber, Chars at 165 °C, UV Resistance: Fair

#### Chemical Resistance

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents, soluble in chlorinated hydrocarbons

#### Advantages

- Light weight
- Inexpensive
- Unaffected by water
- Excellent microbial resistance

#### Disadvantages

### MANILA

Natural Fibre, Chars at 148 °C, UV Resistance: Very Good

#### Chemical Resistance

- Degraded by acids in high concentration or high temperature
- Degraded by alkalis
- Resistant to organic solvents

#### Advantages

- Very good creep resistance (gradual elongation under load)

#### Disadvantages

- Poor microbial resistance
- Can be rough to handle

### POLYSTEEL

Synthetic Fiber, Chars at 140 °C, UV Resistance: Fair

#### Chemical Resistance

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents, soluble in chlorinated hydrocarbons

#### Advantages

- Light weight
- Good handling characteristics
- Unaffected by water
- Higher strength than polypropylene
- Excellent microbial resistance

#### Disadvantages

- Low strength relative to other synthetic fibers
- Susceptible to creep (gradual elongation under load)

## NYLON

**Synthetic Fiber, Nylon 6 melts at 218°C, Nylon 6.6 melts at 258°C, UV Resistance: Good**

### Chemical Resistance

- Resistant to weak acids
- Degraded by concentrated, strong acids
- Unaffected by most alkalis at room temperature
- Resistant to organic solvents, soluble in phenols and formic acid

### Advantages

- Good strength
- Excellent microbial resistance

### Disadvantages

- Susceptible to creep (gradual elongation under load)
- Abrasion resistance of wet nylon is generally poor
- Minor loss of strength when wet; strength is re-gained once rope dries

## KEVLAR

**Synthetic, Decomposes at 500 °C, UV Resistance: Poor**

### Chemical Resistance

- Resistant to weak acids, bases, water & salt water
- Degraded by strong acids & bases in high concentration or high temperature

### Advantages

- Exceptional strength
- Exceptional heat resistance

### Disadvantages

- Poor shock loading qualities
- Poor abrasion resistance
- Expensive

- Susceptible to creep (gradual elongation under load)

## POLYESTER

**Synthetic, Chars at 254 °C, UV Resistance: Very Good**

### Chemical Resistance

- Resistant to mineral acids
- Degraded by strong sulphuric acids
- Degraded by strong alkalis at high temperature
- Resistant to organic solvents, soluble in phenols

### Advantages

- Excellent microbial resistance
- Good strength & durability
- Unaffected by water

### Disadvantages

- None

## DYNEEMA

**Synthetic, Melts at 145 °C, UV Resistance: Fair**

### Chemical Resistance

- Acid & alkali resistant
- Resistant to bleaches, other oxidizing agents and most solvents
- Unaffected by sea water

### Advantages

- Good strength
- Unaffected by water

### Disadvantages

- Susceptible to creep (gradual elongation under load)
- Expensive

## TECHNORA

**Synthetic, Decomposes at 500 °C, UV Resistance: Poor**

### Chemical Resistance

- Resistant to acids
- Resistant to alkalis
- Resistant to organic solvents
- Resistant to sea water and steam

### Advantages

- Good strength
- Unaffected by water

### Disadvantages

- Expensive

# Cancord Inc. – Superior made rope and cord since 1880

**CONTACT US**

At Cancord, we exceed our customers' expectations with unsurpassed quality, exceptional service, true value and custom innovation.



193 Elgin St.,  
Hamilton  
ON Canada  
L8L 4Y2  
Phone: 1-800-879-0079  
Fax: 905-527-7790  
Email: info@cancord.com



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Products  
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Products

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- > Military & Government

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- > Custom Rope and Cordage Manufacturing

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- > Testimonials

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## BLOG ARTICLES

- > Military Grade Parachute Cord vs. 550 Paracord

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- > Vertical Lifelines & Fall Arrestors for the Swing Stage, Suspended Access and Scaffold Industry in Canada

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- > How to Identify Quality in Braided Rope

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- > History of Rope in the Military

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- > What's Your Breaking Point?

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## THE SCIENCE OF ROPE

Technical specifications illustrated to show Cancord rope strength, safety, and reliability.





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