

# ROPE ABC



**expert in  
textile  
technology**

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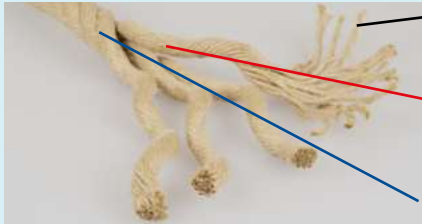
[mamutec.com](http://mamutec.com)



# Rope designs

## 1. Twisted ropes

The classic rope, which was designed as early as hundreds of years ago, is a twisted rope. At mamutec AG, this design is often only still used for natural fibre ropes.



**Yarn** (containing threads)

The individual lines in the yarn are the threads.

**Strand** (containing yarns)

The four yarns are twisted together.

**Rope** (made of four strands twisted together) A four-strand rope

## 2. Braided ropes

The braided rope usually consists of a core rope protected by a sheath. Its advantage over twisted ropes is that it is able to withstand larger forces without kinking.



**Normal braiding**

**Core** (pictured in white)

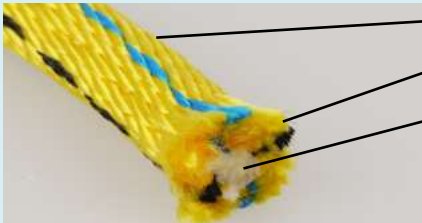
The core bears and is necessary for the load and stress and is always protected by a sheath.

**Sheath** (pictured in black)

The sheath protects the core.

## 3. Paraloc ropes – parallel braiding

In Paraloc technology, the core and sheath fibres are directly interlocked by parallel braiding. Some of the load-bearing core fibres can be found in the sheath area and vice versa. As a result, the rope is one single entity.



**Cover fibre**

**Core fibre**

**Cross fibre**

# Paraloc – the ne plus ultra

**Paraloc: the further development of the conventional rope** mamutec's Paraloc technology is an absolute revolution in the rope-making world. The patented parallel-braiding process directly interlocks the cover and the core. The braided core and cover fibres give the rope significantly higher form stability, thus helping to considerably improve its properties:

- No sheath slippage
- Increased abrasion and chafe resistance
- A dense surface
- Interlocked core and surface fibres
- A stable form and controlled distribution of forces

## Rope generations



### First generation

Twisted rope

### Second generation

Woven rope

### Third generation

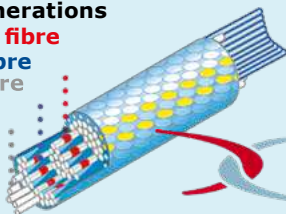
Parallel-braided kern-mantle rope (Paraloc)

## Normal braiding / Paraloc



## Rope generations

**Cover fibre**  
**Core fibre**  
**Cross fibre**



**PARALOC**  
SWISS ROPE TECHNOLOGY

# Raw material properties

## Polyester ropes (PES)

PPolyester ropes have a high tear resistance and are smooth, user friendly, durable, rotproof and salt water resistant.

### Main areas of application:

Nautical science, trade, leisure



## Polyamide ropes (PA)

Polyamide ropes are smooth, user friendly and rotproof. Please note: Loss of strength of 10–15 % when wet.

### Main areas of application:

Transport, home, construction, dog leads.



## Polypropylene ropes (PP)

PPolypropylene ropes are tough, rotproof, UV resistant and buoyant. Moisture and humidity cause no loss of strength.

### Main areas of application:

Camping, home, garden, leisure



## Elastic ropes

Natural rubber core with a braided sheath of PA/PES yarn; the stretching capacity of the cord is approx. 100 % (twice its own length).

### Main areas of application:

Ideal for fixing tarpaulins



## Hemp/Sisal natural fibre ropes

HHemp and sisal yarns are pure natural fibre products. They are anti-static and have a lower tear resistance than chemical fibres. Wet natural fibre ropes should be air-dried before storage.

### Main areas of application:

Agriculture, home, garden



# Properties of the most important raw materials for ropes



	PES Polyester	PA Polyamide	PP Polypropylene	Elastic	Hemp, flax
Specific weight	1.38	1.15	0.91	1.15	1.43
Relative wet strength	100 %	85-90 %	100 %	85-90 %	110 %
Moisture absorbtion	0.5 %	3.5-4 %	0 %	3.5-4 %	10 %
Melting point in Celsius	250°	200°-210°	150°-170°	200°-210°	low
Continuous heat resistance	120°	100°	80°	100°	80°
Flammability	flame-resistant	flame-resistant	flame-resistant	flame-resistant	flame-resistant
Weathering resistance	very good	good	very good	good	moderate
UV resistance	very good	good	moderate	good	low
Resistance to acids alkalis organic solvents	good moderate very good	low good good	very good very good varied	low good good	low low moderate
Stretch (yarn quality reference value)	10-15 %	15-20 %	15-20 %	100 %	2-4 %

**Tear resistance and daN:** All data specified are average values from ongoing tests. Loads and forces are specified in newton (N). 1 N is equivalent to 0.1 kg (precisely 0.1019 kg), **1 daN ≈ 1 kg**

## Dangers when handling ropes



Knotted leads to a strength loss of up to 50 %!



Acids and alkalis can damage a rope!



Do not climb! The ropes are not suitable for climbing.

# Useful information on using ropes



## Cut ropes correctly

You can purchase ropes that are already cut to size. If you require a rope with a specific length, you can also cut it or ask for it to be cut directly from the reel.

When doing so, please be aware that ropes made of plastic fibres should be cut with the hot cutter, and ropes made of natural fibres, for example sisal ropes, should be cut with scissors.



## Various factors behind loss of tear resistance

- The rope loses tear resistance of 2–10 % every year due to UV radiation. This loss depends on the raw material used to make the rope.
- The rope loses tear resistance of up to 50 % due to knotting or splicing..
- Jerking forces lead to a loss of tear resistance.
- Excessive twisting may reduce the stability of the rope.

With our ropes, we usually differentiate between the breaking load and the payload.

The breaking load is the value at which the rope breaks under normal tension.

The payload is basically a fifth of the breaking load and corresponds to the value for which the rope is suitable for use.



## Storage

Correct storage can extend the lifespan of your rope. Be sure to store your rope in a dry place away from UV radiation.

The rope should always be kept away from acids and alkalis. It is best to store the rope in a building at room temperature.



## Cleaning

Ropes can generally be washed. Be sure that the rope has dried completely before use. We recommend cleaning natural fibre ropes and twisted ropes by hand with a soft brush. The right care can extend the lifespan of a rope. We recommend washing the rope at 30 degrees Celsius without spinning.

# Rope splicing



## Step 1 – Blue through white

First, cut the rope. You can then unravel the rope and place the three strands next to each other. Push the rope together to create space so that you can push the blue strand through the rope as pictured.



## Step 2 – White through red

First, flip over the loop. Push the rope together, then turn the rope or loop. Push it through the adjacent strand (from step 1) – in this case white through red.



## Step 3 – Red through blue

In this step, you no longer need to turn the loop. Push the rope together again to create space for the red strand. Push the red strand through the first possible opening next to the blue strand.



## Step 4 - Repeat

Repeat steps 1–3 three times. Always make a gap at the next possible strand so that you can again push blue through white, red through blue and blue through white. Once the three strands have been pushed through the gaps four times, your loop should look as pictured.



## Step 5 - Cut

You can now cut off the remaining strands (as shown in image 4), preferably using a hot cutter for plastic fibres. If you do not have a hot cutter, you can use scissors to cut off the strands then use a lighter to melt the ends.

# Rope accessories



## Differences between our accessories

Our accessories have different packaging labels, which generally differentiate between galvanised and stainless steel accessories. The galvanised accessories usually have fully coloured packaging, while the stainless steel accessories are marked with INOX (AISI 316 / Ar) and have an additional grey area.

## Galvanised accessories

Our galvanised accessories are of a high quality. The items mainly have a long lifespan when used indoors.

## Stainless steel accessories

Our high-quality stainless steel accessories conform to INOX A4 AIS 316. These accessories are salt water resistant and therefore have a longer lifespan than galvanised accessories. The stainless steel accessories can therefore be used indoors and outdoors without any concerns.



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