

MYTEE
PRODUCTS



STEEL CORE WIRE ROPES & WINCH CABLES

*Specifications,
Usage Guide, and
Mandatory
Safety Information*

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KNOW THE (WIRE) ROPES



KNOW THE (WIRE) ROPES

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Anyone who needs to operate a tow truck or crane at any time needs to have accurate, up-to-date information about the tools they're working with.

Every individual user of wire rope is responsible for his or her own safety. While this document is intended to be a useful guide, it is not designed to replace continual and in-depth safety education on proper equipment usage.

UNDERSTANDING WIRE ROPES: DEFINITIONS & DIAGRAMS

When working with wire rope, it's useful to have a clear definition of terms relevant to the product. Terms are divided into three categories: general relevant terms, definitions of parts of a wire rope, and an explanation of organization's acronyms to be aware of.

Here are relevant, general terms:

Coil - a length of wire rope curled or spooled around a cylindrical drum in a loose spiral.

Contour- an outline of the curvature (roundness) of the wire rope

Core - the center of a strand of wire rope, which can be fiber or independent steel wire

Design Factor- a measurement that accounts for uncertainties in a wire rope's construction, given by the manufacturer

Grooves - the narrow indentations in the surface of the wire rope

Nominal Strength - the total strength of a wire rope in theory before applying mitigating factors

Winch - an automated device turned by a crank to lift or haul objects

Working Load Limit - the maximum weight of an object that a wire rope is guaranteed to haul safely; 1/3 of the breaking strength of a wire rope

WORKING LOAD LIMIT

Working Load Limit is the upper limit, in pounds, that a wire rope can safely tow. It is 1/3 of the breaking strength.

This number will be printed on a tag or end-fitting attached to the wire rope. **Do not exceed this limit.**

WHAT'S A WINCH?

A winch is the device that wire rope is spooled onto. Winches wind and unwind wire ropes to haul and lift cargo, as part of tow truck and crane systems.



KNOW THE (WIRE) ROPES

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PARTS OF A WIRE ROPE

Terms you may need to know.

Center Wire - the central wire in a single strand in a wire rope; there are typically nineteen wires in a single strand

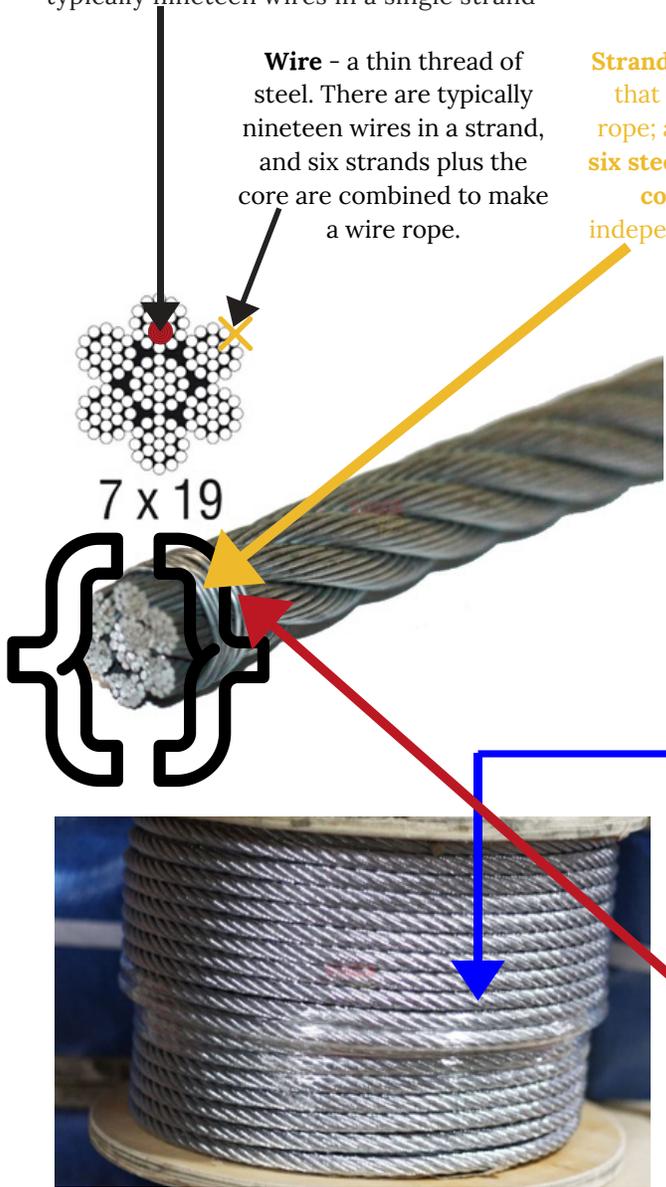
Wire - a thin thread of steel. There are typically nineteen wires in a strand, and six strands plus the core are combined to make a wire rope.

Strand - one of six woven cords that combine to form a wire rope; a wire rope is made up of **six steel strands** and one **center core**, which is either an **independent wire rope core** or a **fiber core**

Sheaves - the bundles of wires combined to form strands; also, the bundle of strands that form the wire rope itself.

Drum - the cylindrical part of a winch that holds the wire rope in a spool

Steel Sleeve - the metal loop or open cylindrical binding that bundles ("sheaves") the strands of a wire rope together



STEEL CORE

VERSUS

FIBER CORE

COMPARING YOUR WINCH CABLE OPTIONS



Independent Wire Rope Cores (IWRC) are made of steel threads and steel cores



Fiber Core (FC) wire ropes are covered in steel threads but have polypropylene cords at their centers

Steel Core wire ropes are stronger and have a higher working load limit (WLL)

Fiber Core wire ropes are more flexible, but have a lower working load limit (WLL)

IWRC cables are crush-resistant

FC wire ropes accept lube more readily and can be lubricated less often.

Steel core wire ropes are more susceptible to "bird nesting."

Fiber core wire ropes have slightly more cushion or give

PROPER USEAGE, MAINTENANCE & STORAGE

adapted from OSHA, ASME, and SAE guidelines

PROPER WIRE ROPE USAGE

Wire ropes wear out. Every wire rope becomes weaker with each use.

To use a wire rope properly, make sure to continuously check it for damage, wear, and tear. Also, never overload a wire rope. This means, never use a wire rope to lift or haul a load that is heavier than the wire rope's printed working load limit.

Before using a wire rope, check it for wear and tear.

Specifically, check for the following:

- Is the rope distorted? The rope should not have kinks. The core should not protrude from its center alignment. The strands should be even, and there should be no evidence of crushing or birdcaging.
- Is the steel corroded by rust or other chemical damage?
- Are any wires visibly broken? If so, how many?
- Are any strands cut or broken?



After this visual check, **remove the wire rope from service** if **even one** of the following qualities are true about the rope:

- the core has popped out from the center
- the working part of the rope has kinks
- the wires are pitted or corroded from heat or chemical damage
- there are more than 11 broken wires in 6 meters of wire rope (lengthwise)
- there are more than 3 broken wires in a single strand
- more than 2 broken wires at an end connection

PROPER USEAGE, MAINTENANCE & STORAGE

adapted from OSHA, ASME, and SAE guidelines

PROPER WIRE ROPE USAGE

Wire ropes wear out. Every wire rope becomes weaker with each use.

When you're ready to use a wire rope, **unroll the coil from the drum slowly** and carefully. Unspool it by turning the drum like a wheel, rather than by pulling the rope.

Make sure to leave a trail of straight rope. Pulling the rope or unspooling to quickly can cause kinks or cause undue wear and tear, which you want to avoid.

Then, **measure the diameter of the wire rope**. Measure the outermost contours of the rope using calipers. Do not squeeze the calipers in a way that might contort the wire. Simply measure the diameter comfortably.

Using this measurement, **select a compatible sleeve and end-fitting** of the same size. Connect the sheave and end-fitting, typically a hook, oval stop sleeve or clip, to the wire rope.

Independently research sleeves and end-fittings to **choose one suitable for your job**. Adhere to all warnings. Make sure that any sleeve and end-fitting you choose has the same working load limit as the wire rope, and that your load's weight is under that limit.



PROPER USAGE, MAINTENANCE, & STORAGE

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To **put a rope onto a drum**, whether that is the operating drum of a winch or a large storage drum, do the following:

- Lay the rope out straight and flat on the ground.
- Pull the rope into the spool using tension. Let the drum turn like a wheel to wind the wire rope up onto it.
- Do not manipulate the rope manually to spool it onto the drum.



PROPER WIRE ROPE MAINTENANCE & STORAGE

Store wire rope in a spool on a drum. Storing wire rope loose risks the rope getting tangled, birdnesting (or birdcaging), and developing kinks.

Even if wire rope is treated for corrosion resistance, it is good to store wire rope in a place where it will be protected from heat, water, and harsh chemicals. Rust from water damage and warping from heat both significantly shorten the lifespan of a wire rope.

In addition to inspecting a wire rope prior to use, proper wire rope maintenance requires the user to **periodically inspect rope drums and sheaves** as well.

Periodically check sheaves to make sure that they are the correct groove diameter. Make sure they are not **pitted or warped** in a way that alters their curvature, which makes the sheave less effective at supporting the rope.

Check both the sheave and the drum for small holes, cracks, uneven surfaces, improper alignment, and other defects.

Drums must be checked for signs of wear and tear that cause rope to hang loose or flatten out.

Damaged sheaves and drums must be removed from use until they can be fixed or must be discarded.



KNOW THE (WIRE) ROPES

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ORGANIZATIONS TO KNOW

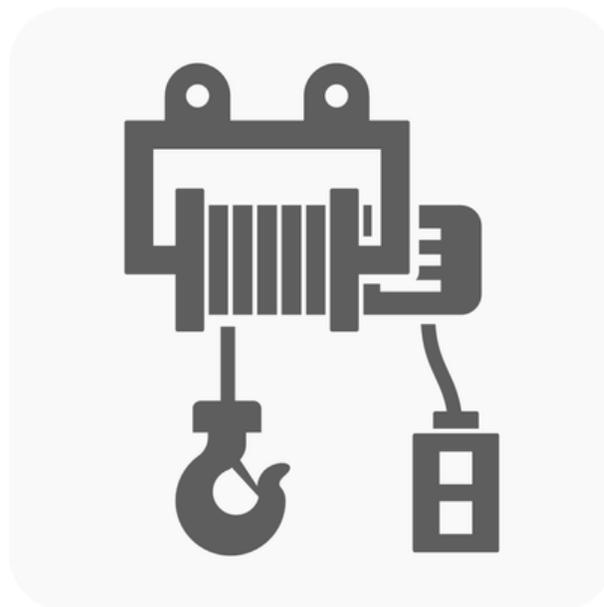
Four organizations to be aware of

ANSI- American National Standards Institute. This non-profit organization is responsible for developing product standards by consensus, including standards for wire rope.

ASME - American Society of Mechanical Engineers. This professional association is invested in building the reputation and success of interdisciplinary engineering. Part of that brand building involves making sure that well-engineered products and tools meet their high standards.

AWRF - Associated Wire Rope Fabricators. This association is devoted to the development and improvement of wire rope by and for designers and end-users. The association includes over 400 companies in 25 countries internationally.

OSHA - Occupational Safety & Health Administration. OSHA is a government agency created to protect workers and improve worker safety conditions. OSHA is responsible for regulations and mandates at the state and federal level. These regulations apply to wire rope manufacturing and use, among other things.



RELEVANT LAWS & REGULATIONS

Last updated 02/03/2020

OSHA has created an in-depth document guide that summarizes the standards and regulations a wire rope must meet to be used safely in a workplace.

A damaged wire rope is a workplace hazard. Damaged wire ropes violate safety regulations and have been implicated in workplace fatalities.

[Read the full document here.](#)

The full, legal parameters that regulate wire rope inspection can be found on the OSHA website, [which you can read here.](#)

OSHA's guidelines and mandates regulating wire rope selection and installation can be [read in full here.](#)

ASME's guidelines and regulations regarding wire rope inspection are [printed here.](#)

WIRE ROPE IN USE

