maXtensor® *pro*

accessories for suspending loads in industrial applications

www.maxtensor.com

Adjustable/Removable Tensioner

mx2-ind

mx2-ind tensioner mx-HDIM spanner mx-HDI spanner

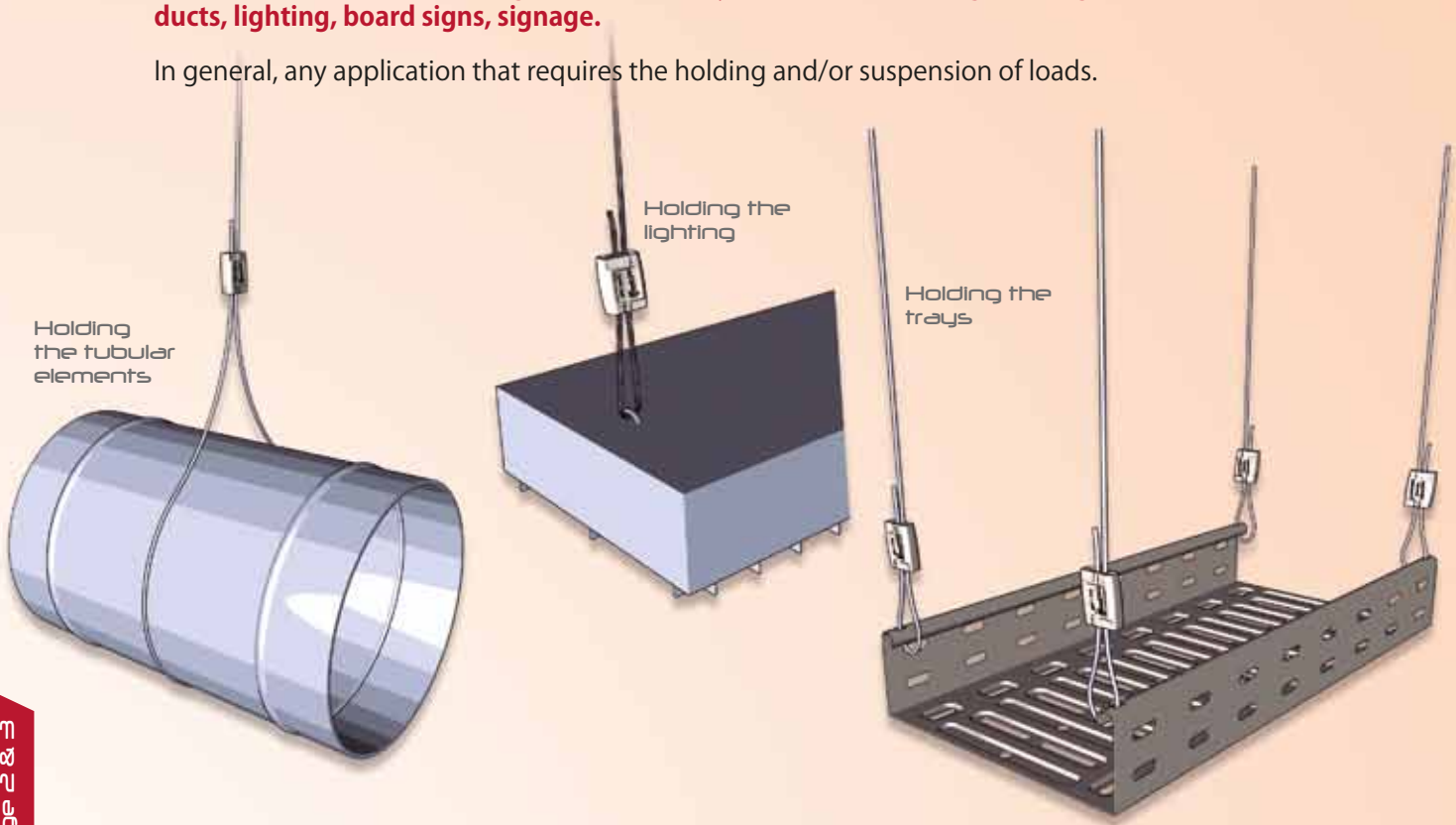
The adjustable/removable tensioner (mx2-ind) for suspending loads in industrial applications allows for the holding/suspension of protruding structural elements such as beams, metal structures and any other protruding element found in an industrial/commercial building, as well as using false or suspended ceilings and other hollows in the framework that are accessible and resistant.

The height of the load is adjusted using the mx-HDI loosening spanner by unlocking the tensioner's lock system. It also has the mx-HDIM loosening spanner for greater ease-of-use; this spanner has an additional straight point for the application of higher de-tensioning loads.

applications:

Suspension of air-conditioning ducts, cable trays for electrical wiring, pipes, gas exhaust ducts, lighting, board signs, signage.

In general, any application that requires the holding and/or suspension of loads.

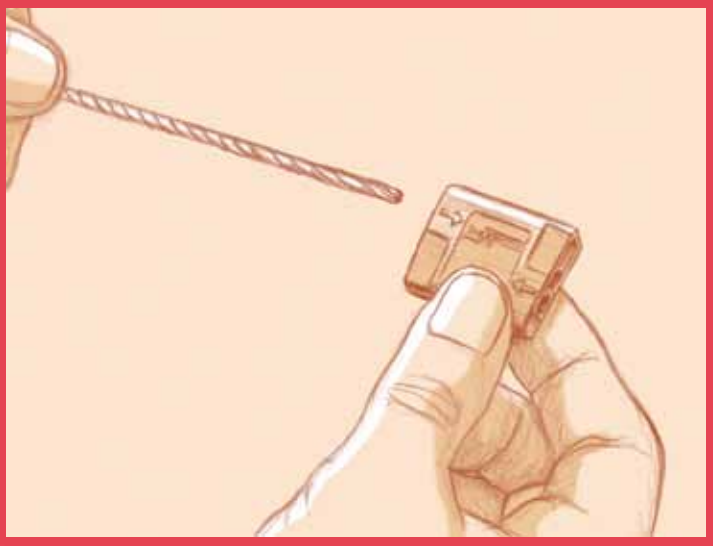


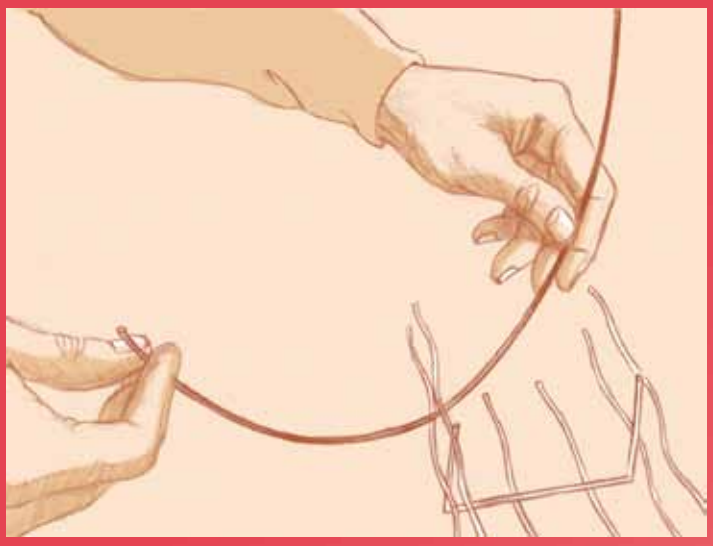
advantages:

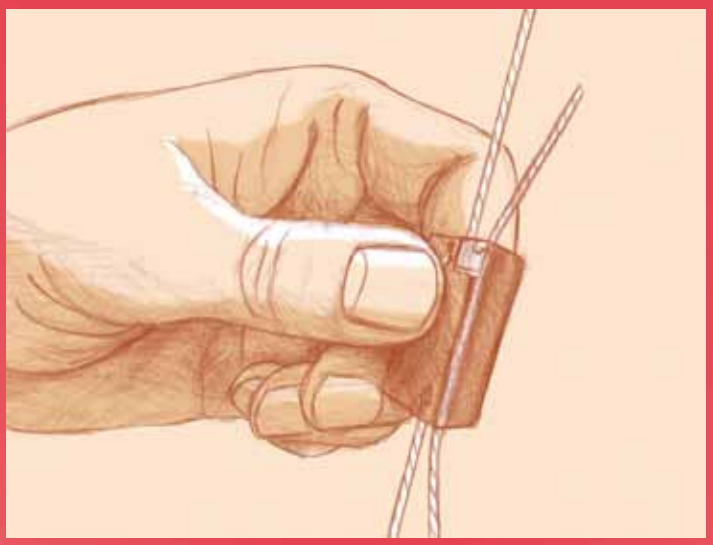
Easy to install with no difficult adjustments of nuts and screws. Does not require the use of tools, and therefore reduces the risk of accidents of materials falling during overhead installation. Reduces installation time by 80%.

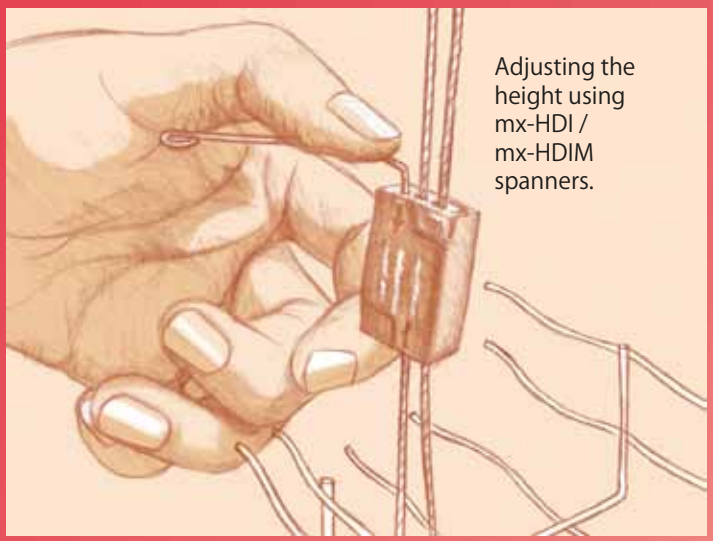
Can be handled safely as it is light to carry and easy to install.

Method of Use:



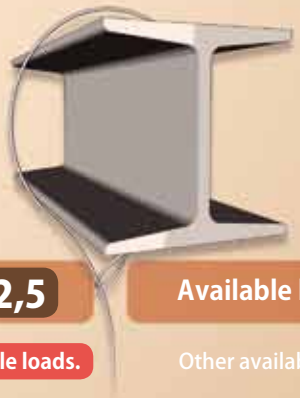






Adjusting the height using mx-HDI / mx-HDIM spanners.

cables and terminations:



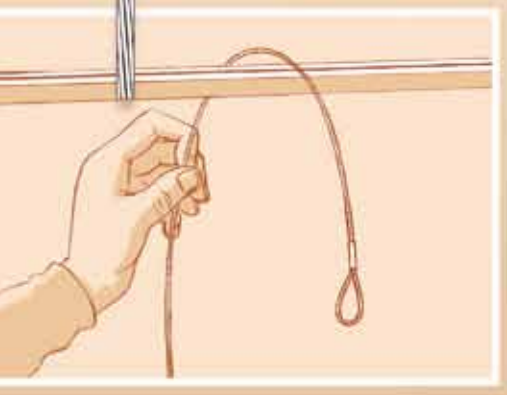
Loop cable:

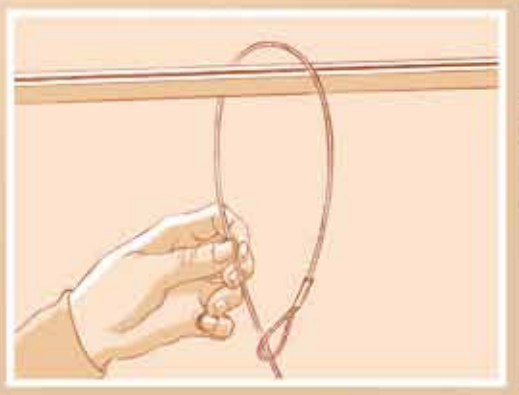
Ø cable (mm)	1,5	2	2,5

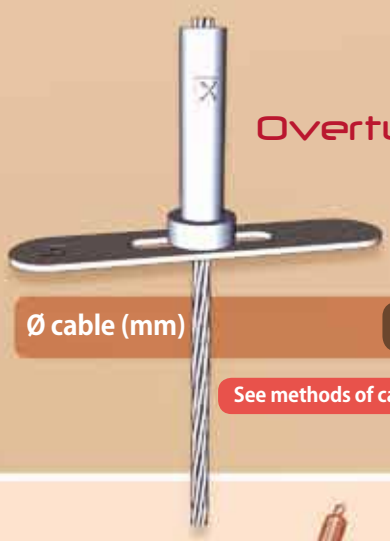
See methods of calculation and permissible loads.

Available lengths (m)	2	3	5

Other available lengths on request.





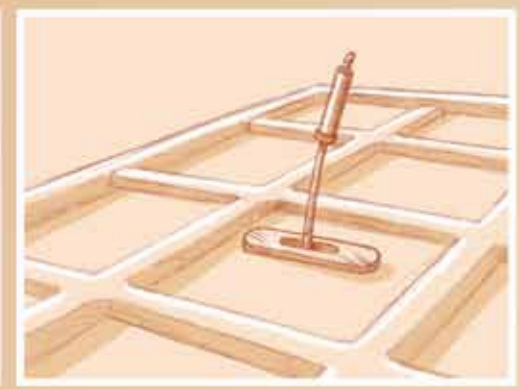


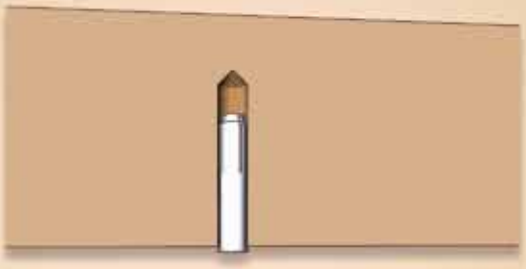
Overturn:

Ø cable (mm)	1,5	2	2,5

See methods of calculation and permissible loads.

Available lengths (m)	2	3	5





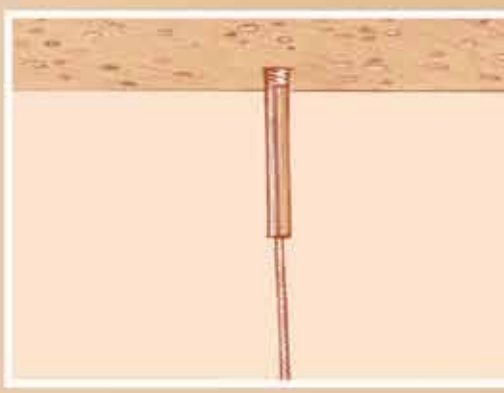
Threaded bolt M6:

Ø cable (mm)	1,5	2	2,5

See methods of calculation and permissible loads.

Available lengths (m)	2	3	5

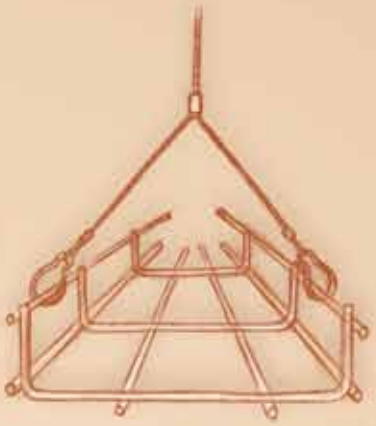
Other available lengths on request.



"Y" accessory

max 60º

Available in Spring Hook/ Overturn/ Thread M6 terminations



Ø cable (mm)	1,5	2	2,5

See methods of calculation and permissible loads.

Spool

Bushing

Mechanical and electrical spanner


maXtensor®
pro

Methods of calculation and permissible loads:

Before installing the mx2-ind tensioner, it is recommended to make a calculation to determine the number of tensioners to be used and the selection of the most suitable cable diameter for each application depending on the layout of the load.

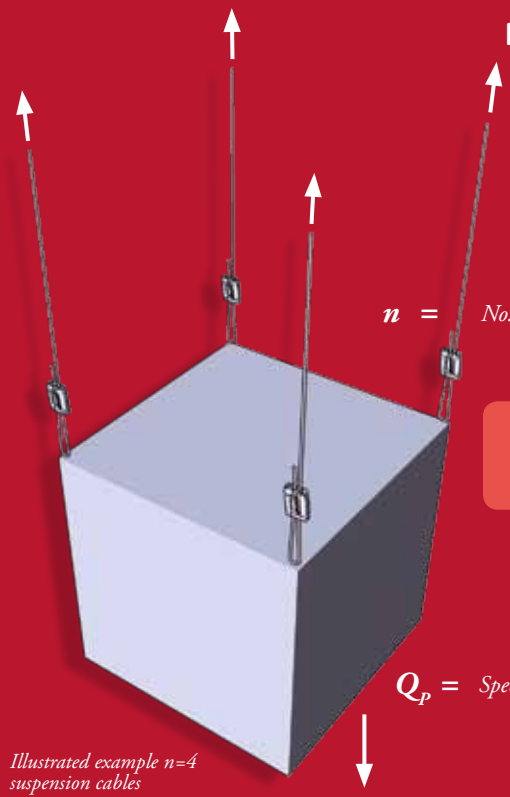
Permitted cable dimensions:

The MaxTensor® mx2-ind tensioner has been designed for use with stranded steel cable with diameters of between 1.5 and 2.5 mm.

We can consider the following load layout cases:

- Specific load
- Evenly distributed load
- Effect of suspending load with a cable direction that is not vertical

Method of calculation for specific load:



Illustrated example n=4 suspension cables

C_T = *Work load that will be supported by the suspension cable (kg).*

n = *No. of the same suspension cables used.*

$$C_T = \frac{Q_P}{n} \leq C_m$$

Q_P = *Specific load to be suspended (kg).*

C_T = **Work load that will be supported by the suspension cable (kg).**

Q_P = **Specific load to be suspended (kg).**

n = **No. of the same suspension cables used.**

C_m = **Maximum work load of the selected suspension cable (Consult tables).**

Method of calculation for evenly distributed load:

n_R = *No. of suspension cables that support the load for each stretch of distance "d".*

$$C_T = \frac{Q_R \cdot d}{n_R \cdot \cos \Theta} \leq C_m$$

C_T = **Work load that will be supported by the suspension cable (kg).**

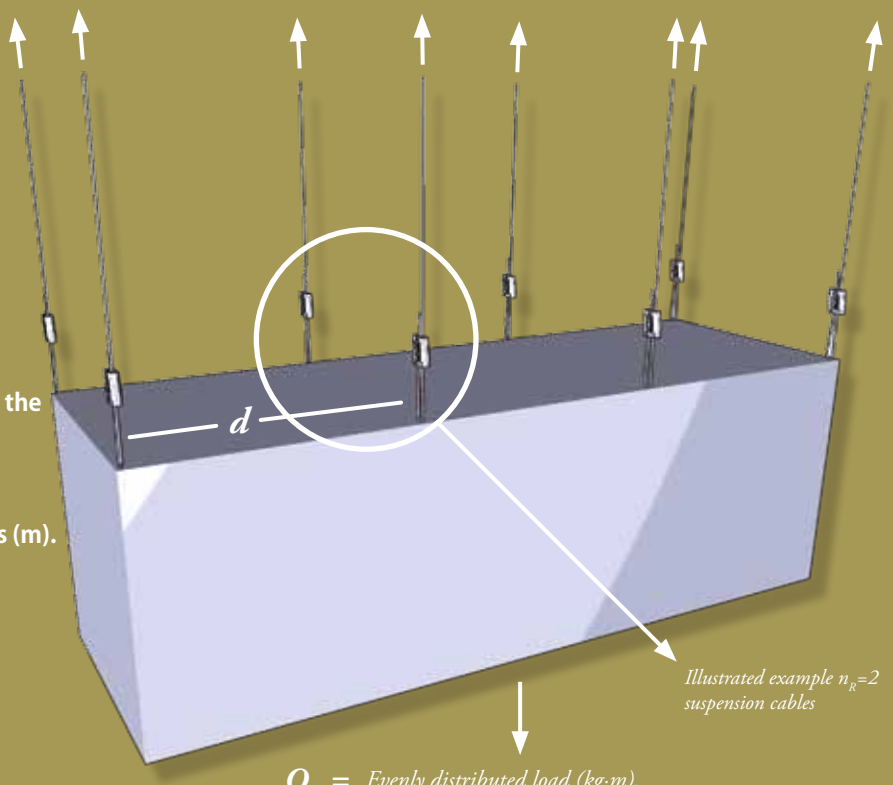
Q_R = **Evenly distributed load (kg·m).**

d = **Distance between suspension cables (m).**

n_R = **No. of cables for each stretch "d".**

C_m = **Maximum work load of the selected suspension cable.**

C_T = *Workload that will be supported by the suspension cable (kg).*



Illustrated example n_R=2 suspension cables

Q_R = *Evenly distributed load (kg·m).*

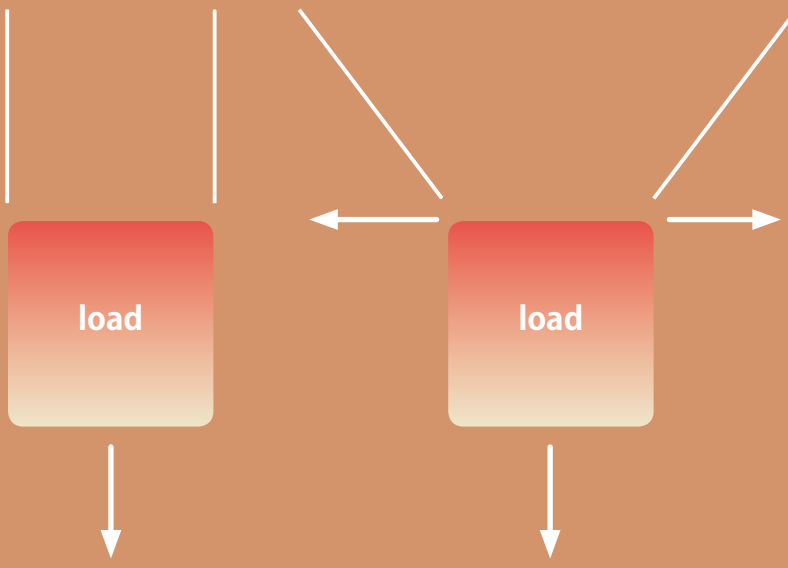
The formulas given on this page should only be applied when the layout of the cable to suspend the load is vertical. Otherwise, use the method of calculation of the angle between the cable and the vertical.

C_T will be the value of the minimum load that any additional accessory used with the cable should support, as well as any other building element used as a support. A safety factor of 3:1 or 5:1 is recommended depending on the criteria considered appropriate for each case.

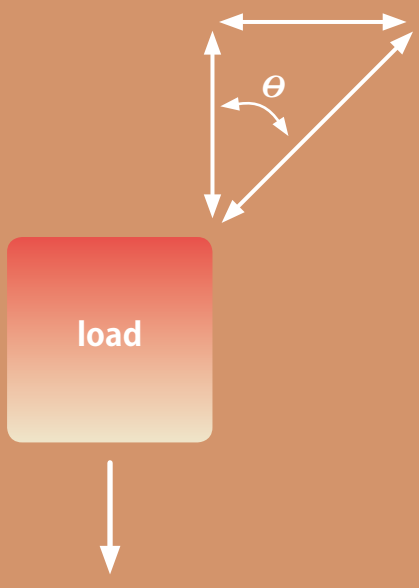
Method of calculation to consider the effect of suspending loads with a non-vertical cable direction:

The previous formulas should only be used when the layout of the cable for suspending the load is vertical. If the cable forms an angle in relation to the vertical, the effect of this angle needs to be taken into account, because it reduces the recommended maximum load and its value depends on this angle.

Why is the recommended maximum load reduced when a load is suspended with a cable in a direction that forms an angle with the vertical?
It is very simple. When a load is suspended in these conditions, the cable is subjected to a composition of forces: the corresponding vertical load + the lateral force component that falls on it:

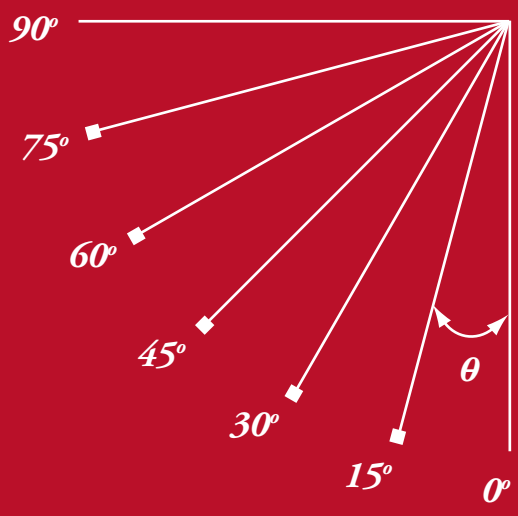


The combination of these forces increases the tension on the cable. The greater the angle of the cable on the vertical, the greater the lateral component.



We can say that the tension on the cable is the hypotenuse of the triangle formed by the vertical load and the horizontal lateral force. Therefore, the tension load on the cable can be calculated by using the following formula:

Cable load =
Value of suspended load / cos (θ)



General formula:

For specific load:

$$C_T = \frac{Q_P}{n \cdot \cos \Theta} \leq C_m$$

For evenly distributed load:

$$C_T = \frac{Q_R \cdot d}{n_R \cdot \cos \Theta} \leq C_m$$

Data and maximum load for the suspension cables supplied by MaxTensor:

The recommended vertical maximum load values in accordance with the safety coefficient are shown in the following table.

Type of cable	C_m (kg)	
	Safety Coeff. μ = 5:1	Safety Coeff. μ = 3:1
Ø 1'5 (7*7 threads)	30	50
Ø 2 (7*7 threads)	45	75
Ø 2'5 (7*7 threads)	60	100

The recommended maximum load values in accordance with the angle and the safety coefficient are shown in the following table.

Type of cable	C_m (kg)									
	0°		15°		30°		45°		60°	
	μ=5:1	μ=3:1	μ=5:1	μ=3:1	μ=5:1	μ=3:1	μ=5:1	μ=3:1	μ=5:1	μ=3:1
Ø 1'5 (7*7 threads)	30	50	29	48	26	43	21	35	15	25
Ø 2 (7*7 threads)	45	75	43	72	39	65	32	53	22,5	38
Ø 2'5 (7*7 threads)	60	100	58	97	52	87	42	71	30	50

important recommendations

- **It is necessary to carry out the inspections required to verify that the structural element used to suspend the loads can resist the weight of the load to be suspended.** The anchoring base varies depending on the type of construction and the materials used in its construction. It is the customer's responsibility, and NOT the responsibility of MAXTENSOR® to assess the resistance of the anchoring base so that the loads transmitted by the MAXTENSOR® SUSPENSION ACCESSORIES are supported safety, as well as compliance with the current legal provisions corresponding to each installation.
- **Do not exceed the maximum loads recommended by MAXTENSOR®.** While MAXTENSOR® provides technical information and general advice on its SUSPENSION ACCESSORIES, the customer is solely responsible for selecting the product that is appropriate for each specific application. All recommended load values (C_m) are for static loads (C_m).
- **Ensure that the load is correctly distributed among all the MAXTENSOR® SUSPENSION ACCESSORIES.** To do this, verify that the cables of all the MAXTENSOR® SUSPENSION ACCESSORIES are under load.
- **Only use the steel cable supplied in the MAXTENSOR® SUSPENSION ACCESSORY.** The recommended values correspond with the results of the tests carried out with the cables supplied by MAXTENSOR®. MAXTENSOR® is not liable if cables other than those supplied by MAXTENSOR® are used.
- **Always verify that the self-locking system of the adjustable/removable tensioner (mx2-ind) for suspending loads is completely interlocked.** To do so, it is advised to apply manual tension on the load after its installation to verify this.
- **MAXTENSOR® SUSPENSION ACCESSORIES should not be used as a load lifting system under any circumstances.**
- **Do NOT use the adjustable/removable tensioner (mx2-ind) to connect cables together. In this case, the reduction in the load capacity of the adjustable/removable tensioner (mx2-ind) would be 50%.**
- **Area of use:** The MAXTENSOR® SUSPENSION ACCESSORIES are specially designed for suspending loads inside buildings and in a dry environment. Consult MAXTENSOR® regarding their installation outdoors or in areas of high humidity or damp.
- **Do not apply lubricants or paint** on any MAXTENSOR® SUSPENSION ACCESSORY, as this may impede its correct operation and/or reduce its load capacity.
- **MAXTENSOR® SUSPENSION ACCESSORIES are to be kept clean so that it does not become locked or its load capacity is not reduced.**
- **It is recommended to wear safety gloves and glasses when handling and installing MAXTENSOR® SUSPENSION ACCESSORIES.**
- If the end of the cable is blunt, it is recommended to cut the point to make it easier to install in the **adjustable/removable tensioner (mx2-ind). However, ensure that the cable protrudes at least 50 mm in length** for possible adjustments.
- **If the user instructions are not followed, the MAXTENSOR® SUSPENSION ACCESSORIES may not work correctly. MAXTENSOR® SUSPENSION ACCESSORIES comply with the manufacturer's specifications, and the latter is not liable for any damage caused to persons or property due to their incorrect use.**

made in spain

pro

maxtensor® pro

the professional's guarantee:
maximum tension, maximum
resistance, maximum reliability

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