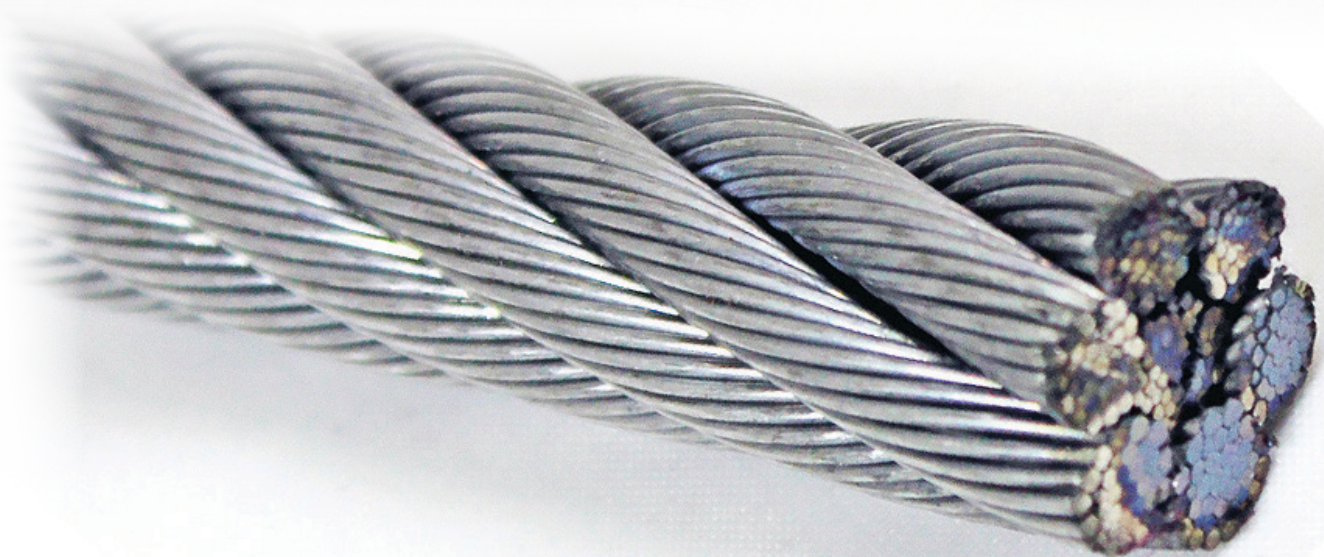


Wire Rope & Steel Cable: Electro Galvanized vs. Hot Dip Galvanized



A look at the differences in cost, corrosion-resistance, and suitable applications for galvanized wire rope and steel cable.

Steel strand can be used in the production of a variety of different products including wire rope, aircraft cable, and structural cable for bridge and building support. The construction of steel cable consists of thin steel wires that are stranded together to give the cable the perfect blend of strength and flexibility. Different constructions allow steel cable to be used in a number of different industrial, commercial, recreational, and military applications.



For extreme environments where exposure to moisture, salt water, or corrosive or caustic chemicals is possible, the correct type of stainless steel cable is the preferred choice. For most applications, a galvanized zinc coating will offer some form of corrosion resistance and still provide the strength and flexibility characteristics desired by the end-user.

However, the term “galvanized” can be confusing for the end-user as there are a number of options for providing protection to the base metal. In this article, we’ll be reviewing two different galvanization processes—electro galvanization and hot dip galvanization.

There are a number of cable distributors who carry one type of product and mark it as “galvanized,” but don’t specify whether it’s electro galvanized or a hot dip galvanized product. This can lead to confusion for the end-user when they’re comparing galvanized cable quotes because the price and corrosion-resistance can vary between products of equal specifications.

Our goal for this article is to explain the differences between the two types of galvanized coatings, and identify the advantages, disadvantages, and proper applications for each product type.

What Is Steel Cable Primarily Used For?

- **Lifting and Rigging** – Steel cable can be made into wire rope slings or cable assemblies and used in conjunction with hoists or winches for lifting, pulling, and hanging applications.
- **Vehicle and Load Securement** – Securing military vehicles and aircraft and/or securing and tying down cargo
- **Boats and Maritime** – Securing boats in docking situations or hoisting boats in and out of the water
- **Overhead Doors** – Used in conjunction with a strong pulley system to open and close garage or overhead doors
- **Perimeter Fencing** – Used at construction sites or other locations as perimeter or security fencing
- **Fall Protection Barriers and Tie-Off Points** – It can also be used as a line for workers to tie off to or a barrier to prevent falls for employees working at height
- **Guy-wire, Guy-line, or Guy-rope** – is a tensioned cable designed to add stability to a free-standing structure. They are commonly used in ship masts, radio masts, wind turbines, utility poles, fire service extension ladders, and used in church raises and tents.
- **Zip Lines** – Professional zip line courses utilize steel cable for its strength and durability

What Is Electro Galvanized Cable?



Electro galvanization is a form of zinc electro plating where a thin layer of zinc is electrically and chemically bonded to steel in order to protect against rust and corrosion.

During this process, bare steel wires are fully immersed in a saline/zinc bath and electricity is used to move electrons from the zinc (anode) and bond them to the steel (cathode). In this case, the zinc acts as a barrier layer on top of the steel to prevent corrosive substances from reaching the underlying steel or iron. The wires are then formed into strands and then the strands are helically formed into the finished cable or wire rope configuration.

When the process is complete, the finished coating is smooth, drip-free, and shiny—making it ideal for architectural applications or other applications where its aesthetic characteristics would be of value. However, once it's exposed to the elements, the finish can quickly deteriorate.

Advantages of Electro Galvanized Cable

- Aesthetics - clean bright finish
- Uniform zinc coating
- Cost-effective solution

Disadvantages of Electro Galvanized Cable

- Shorter service life – ranging from a few months to few years depending on exposure to caustic or environmental elements
- Will corrode much faster than an identical product that's been hot dip galvanized
- Thinner zinc coating comparatively

Applications

Electro galvanized cable should be used in applications with limited exposure to harsh or extreme environments. It offers minimal corrosion protection, but in instances where it's fully exposed to the elements, it will begin to corrode much faster than hot dip galvanized.

The main advantage to electro galvanized cable is that it's the most cost-effective solution. For construction sites, it can be used as perimeter cable or as a barrier or tie-off cable for employees working at heights. For applications where it may experience field use for a few weeks or a few months, it can then be safely disposed of once the project is complete.

If exposure to the elements is minimal, it can be used in architectural applications for aesthetic purposes due to its naturally bright and shiny finish.

What Is Hot Dip Galvanized Cable?



In hot dip galvanized cable, each uncoated steel wire is immersed in a molten zinc bath. Prior to dipping, the wires are put through a rigorous 7-step caustic cleaning process and then dipped into the molten zinc at a temperature of around 860°F/460°C. As it's withdrawn from the molten bath, the material cools and forms a coating of zinc on the steel. The wires are then formed into strands and then the strands are helically formed into the finished cable or wire rope configuration.

Hot dip galvanizing provides much better corrosion resistance than electro galvanization because the zinc coating is typically 5 to 10 times thicker. For outdoor or caustic applications where corrosion-resistance is required, hot dip galvanized cable is the clear choice.

Advantages of Hot Dip Galvanized Cable

- Longer service life than electro galvanized cable
- Process creates an iron-zinc alloy layer on the steel surface and a pure zinc coating on the outer surface. The alloy is very hard and resistant to typical abrasions.
- Normal coating thickness can be up to 10 times thicker than electro galvanized coating

Disadvantages of Hot Dip Galvanized Cable

- Dull finish can be streaky, contain drips, and is typically not applicable in architectural or aesthetic applications
- Significantly more expensive than electro galvanized cable (approximately 40% more expensive for comparable products)
- Galvanic thickness can be inconsistent across the product

Applications

Because it offers superior corrosion resistance compared to electro galvanized cable, hot dip galvanized cable can be used for any application where the cable will be exposed to the natural elements or a caustic environment. Hot dip galvanized cable can be used for fencing or perimeters for construction sites, parking garages, farm and livestock facilities, and much more.

Hot dip galvanized wire rope can also be used for lifting and rigging in crane application and with outdoor winches or pulley systems. Professional zip lines are also another popular use as the cable can withstand corrosion in moist and humid environments.

Wrapping it Up



The term “galvanized” only tells the end-user that some type of corrosion-resistant coating has been applied to the steel material. However, suppliers don’t always specify whether the cable they’re selling is an electro galvanized or a hot dip galvanized product.

Hot dip galvanized will always be more expensive than electro galvanized product because of a more labor intensive galvanizing process and because it offers greater resistance to rust and corrosion.

If you’re looking for a cost-effective option for a short-term project, or need a cable that won’t be exposed to the elements, then electro galvanized cable or wire rope would be the best choice for you.

In order to specify the right type of cable for your next project, do your research and work with a reputable and knowledgeable distributor. This will help ensure that the correct and most appropriate products are purchased for your budgetary and performance requirements.

At Indusco, we sell all different types of wire rope, aircraft cable, and structural cables. We carry stainless, electro galvanized, and hot dip galvanized products and our highly-trained product team can help you determine the right type of steel cable or wire rope for your application. If you're interested in learning more about the different cable products we carry, or need a quote for your next project, contact us today.



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