



SWAGED VS. DIE CAST CABLE COMPONENTS

Enclosing Wire Ends With Swaged and Die Cast Cable Components

Swaged Cable Terminations

Via Mechanical Deformation

Swaged fittings are machined using alloy steels and other metals. They offer dependable tensile and yield strength, elongation, hardness, and creep.

Swaging a cable involves mechanically bonding the sleeve portion (also known as a ferrule) of a fitting over each end of a bundled wire rope. Using either a handheld tool or hydraulic crimping process, a force is applied that compresses the inner surface of the ferrule, creating a permanent, clamped mechanical bond around the cable bundle. The swaging process can involve either a single-hit or a multi-hit, thereby determining the amount of compression along the fitting's entire surface area.

Die Cast Cable Terminations

Via Forged Deformation

Die Cast cable fittings do not use a mechanical deformation process for sleeve or ferrule crimping. Instead, the cable end is placed into a die and injected with molten zinc, creating a sleeve or ferrule that's forged around the surface area of the cable end. Using the zinc casting process, the dies can be customized, allowing manufacturers to produce specialty shaped fittings such as bullets, barrels, and eyelets according to the customer's exact specifications.

During the die cast process, die casted fittings may result in some degree of porosity. If the casting process is not performed correctly, they can exhibit ribs which may ultimately lead to stress cracks and inclusions. By employing a highly refined casting process, porosity can be eliminated.





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Swaged and Die Cast Fitting Characteristics

Swaged Cable Fittings	Die Cast Cable Fittings
Less expensive to produce for low volume runs	More expensive, especially for custom projects due to tooling costs. However, achieve lower production costs vs. swaged fittings when conducting medium to large volume runs
Varied holding strength, but also dependent on a number of design factors	Varied holding strength, but generally higher than swaged fittings. Also dependent on a number of design factors
Holding strength based on a % of the nominal breaking strength of the cable itself. Dependent on a number of design factors (swaging method, geometry, shank, cable type, ferrule type, etc.)	In some cases, diecast cable fittings can exceed the nominal breaking strength of the cable, depending on a number of design factors (geometry, shank, cable type, ferrule type, etc.)
Commonly used for an array of standard applications	Custom designed fittings for specific application requirements
Machined components	Requires seamless, porosity-free casting process





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Swaged vs. Die Cast Fitting Selection—An Application Specific Process

There is a considerable performance overlay involved when choosing between swaged and die cast components:

1. The application dictates the component choice

For example, a swaged barrel design will not possess the same holding strength as a hex plug design. Choosing the proper fitting design and geometry is a primary consideration.

2. The swaging process itself influences holding strength

For swaged fittings, the manufacturing process dictates holding strength. A single-hit swaging system will only compress and deform a specific area around the fitting. A multi-hit, rotary swage system will execute hits along the entire area of the fitting. Fittings manufactured using a multi-hit swaging process will yield greater holding strength. For die cast fittings, holding strength is dependent on the zinc die casting process.

3. The amount of material that penetrates the strands will dictate holding strength

In the case of both swaged and die cast fittings, increased material and strand penetration during the manufacturing process will result in greater holding strength.

4. Components designed with shanks offer an advantage in holding strength

The holding strength for either swaged or die cast fittings can rely on the inclusion of ashank and its geometry. Similar holding strengths can be achieved between the two as long as the appropriate shank design and swaging process is applied.

Holding Strength Factors

- Cable Diameter
- Load Capacity
- Fitting Geometry
- Fitting Type
- Cable Tensile Strength
- Swaging Method
- Material
- Wire Gauge
- Manufacturing Process
- Shank Type



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Fitting Measurements

Fittings are measured as a percentage of the cable's minimum break strength. This value is dependent on the fitting/cable/design/manufacturing combination.

Description: Types of Swage and Die Cast Cable Components
Both swaged and die cast cable components are available in a wide range of end point configurations. From boat rigging to complex structural support, fittings can be incorporated with different end-types that help to secure wire rope.

Swaged Cable Fittings

Die Cast Cable Fittings

Ball	Barrel
Loop	Ball/Plug
Eye	Z Fitting
Threaded Terminal	Bullet
Ball and Shank	Threaded Rod/Stud
Barrel	Hook
Clevis	Jaw (Fork)
Thimble	Eye
Hex Plug	Winch





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Choose the right cable fitting with CMA Cable

CMA Cable offers an array of swaged and die cast end-types for cable fitting applications. To view our complete selection, please visit our catalog. We can offer both consulting and design assistance, backed by seasoned engineers who can navigate the selection process and help you make the right decision for your application needs.

If you have questions or are interested in speaking with us about the proper selection of a pulley for our line of cable assemblies, we are happy to help. Please contact us by email or phone.

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