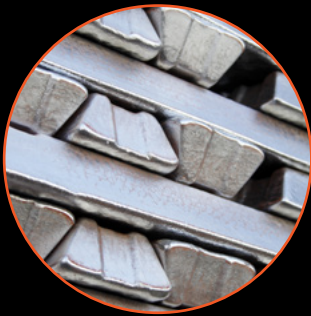




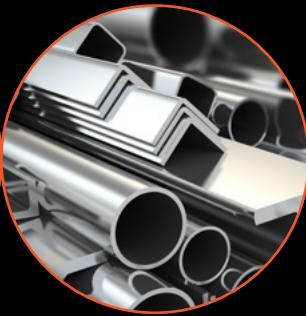
Hardware Materials 101

CHOOSE THE BEST FOR YOUR APPLICATION

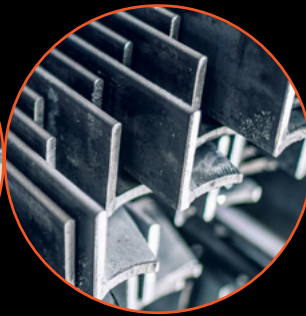
At Henssngen Hardware, we take care to select hardware materials that balance affordability with excellent performance. As part of our commitment to manufacturing and sourcing only high-quality rigging components, we work with the following materials, each ideally suited to rigging applications:



Die-cast
from zinc alloy



Normal steel



Stainless steel



Malleable iron



Brass

While all of these materials are suitable for hardware applications, they do offer different sets of strengths and weaknesses. The optimal choice depends on the unique characteristics of the application. We've compiled this eBook to ensure that you have all of the information you need to accurately compare our product offerings.

This guide will provide important knowledge about material strengths and applications, agriculture-specific materials, and the solutions offered from Henssngen Hardware. If you still have questions, our experienced staff is always happy to provide individualized guidance.



HARDWARE MATERIAL STRENGTH COMPARISON

Strength is a chief consideration for many of our clients—more specifically, tensile strength. Materials with high tensile strength can withstand a great deal of tension before failing, making them ideal for rigging and similar applications. Steel and iron are typically the strongest in this respect. Tensile strength is measured in megapascals (MPa), defined as force per unit area or one newton per square meter.



There may be a great deal of variation between alloys, so it's important to understand the properties of the specific material you select. Sometimes other properties may be important, however, depending on the application. In this section, we compare material strengths as well as their other physical characteristics that may be applicable to hardware design.

DIE-CAST FROM ZINC ALLOY

Depending on the alloy's composition, a zinc alloy's tensile strength tends to be less than 200 MPa, though impact strength is quite high. Due to their high ductility, zinc alloys are also among the most favorable for die casting, which increases the finished strength by subjecting the raw material to high pressure. Zinc alloys are good choices for general-purpose hardware.



NORMAL STEEL

Normal steel, also called mild steel, is a ductile material containing a small amount of carbon. Steels in general have less carbon than some other common materials such as cast iron, and mild steel has less carbon still. Despite the lower proportion of hardening agent, it still has a high tensile strength of around 400 MPa.



STAINLESS STEEL

Stainless steel refers to a larger grouping of steels alloyed with at least 11% chromium. Stainless steels are most notable for their superior corrosion resistance. However, because stainless steel alloys may contain varying amounts of chromium, nickel, molybdenum, titanium, and other metals, they can have a range of tensile strengths but most often hover around 505 MPa. When choosing stainless steel to mitigate the risk of corrosion, you'll need to evaluate which grade of stainless steel offers the necessary level of strength for your application.



MALLEABLE IRON

As with stainless steel, the term "iron" most commonly refers to a group of iron alloys with varying proportions of constituent metals. Malleable irons contain between 0.08-0.2% carbon and are highly ductile and machinable, although they are known to shrink when they cool. Malleable irons typically have a tensile strength between 580-590 MPa.



BRASS

Brass is a set of copper-zinc alloys offering relatively high tensile strength around 360 MPa. Other desirable properties of brass include both electrical and thermal conductivity, corrosion resistance, ductility, and hardness. Since brass is both attractive and strong, it is frequently chosen for functional decorative components.





WHICH HARDWARE MATERIAL IS BEST FOR YOUR APPLICATION?

Even when you know the general properties of a metal, it can still be difficult to determine which is the best fit for your application—especially when so many of the mechanical properties overlap to some degree. In this section, we consider some of the common hardware applications for these metals, but we are happy to provide further advice if you don't find your application listed here.

DIE-CAST FROM ZINC ALLOY

Zinc offers excellent casting properties, along with wear resistance and structural integrity. It is often used for complex nets or as housings for electrical applications. Zinc is also a good choice for hardware that will be used outdoors or be exposed to moisture as it is rust-proof and corrosion-resistant.



NORMAL STEEL

Mild steel is not only tough and strong but also highly ductile with excellent weldability. The combination of mechanical strength and machinability makes it a great choice for a wide range of components. Mild steel is a particularly good material for carburized (heat treated) parts.



STAINLESS STEEL

Stainless steel's chief benefit is its corrosion resistance, which allows it to be cleaned or sanitized without affecting its structural integrity. As a result, stainless steel is most commonly used in the food and medical industries, where sanitation protocols exclude other common metals from consideration. Its strength and corrosion resistance are also beneficial for transportation, industrial, and automotive applications, including scenarios where the hardware will be exposed to saltwater. Like brass, stainless steel is sometimes chosen primarily for its clean appearance, which is coupled with beneficial mechanical properties.



MALLEABLE IRON

Malleable iron is used when components must be malleable enough to endure some degree of flexion without cracking. Being both tough and machinable, malleable iron is suitable for applications like electrical housings and agricultural fittings, among many others.

BRASS

Brass has many applications within the realm of hardware and fittings, including fasteners and connectors, appliance components, and even ammunition shells. Its versatility comes from its unique combination of properties, including corrosion resistance, strength, hardness, and conductivity. Brass is especially popular within the marine and agriculture industries, especially for such components as harnesses and gate fixtures, because it resists elemental exposure and grants a polished appearance to the final product.



MATERIALS FOR THE AGRICULTURE INDUSTRY

Henssger Hardware's line of agricultural rigging snaps and snap hardware are designed to outmatch your toughest outdoor challenges. Whether composed of durable malleable iron, stainless steel, brass, or die-cast zinc, our heavy-duty snap hardware securely connects ropes, chains, gates, and leads. Our hardware catalog includes bolt snaps, panic snaps, trigger snaps, swivel snaps, and quick links that are built to last for the long haul.

Some of our products that are especially relevant to agricultural clients include:

163 DOUBLE END BOLT SNAPS

With springs crafted from high-grade stainless steel, the [163 Double End Bolt Snap](#) resists damage from corrosion, fire, and heat, and is durable enough to withstand extended outdoor use. Strong, attractive, and highly functional, the 163 Double End Bolt Snap represents one of our most premium offerings and is suitable for a full range of agricultural applications.



ALL-PURPOSE SNAP 245

Another of our most sought-after products, the [All-Purpose 245 Snap](#) is made of zinc-coated, 316-grade stainless steel for maximum strength and durability. The lost wax production method used to fabricate these snaps is known to create an extremely durable, uniform material cross-section, meaning that there is consistent strength throughout the part. What's more, like the 163 snap, 245 snaps also offer corrosion resistance, fire and heat resistance, and a polished appearance. Whether rigged to rope, chain, or tractor, the All-Purpose 245 is sure to impress. This line is available in diameters ranging from 3/16" to 1/2" so that they can be used across light and heavy-duty applications on any farm.



In addition to snap hardware, we also offer chain hardware and other common agricultural rigging equipment. You can find a comprehensive listing of our products in [our online catalog](#), or you can contact us with specific inquiries.

HENSSGEN HARDWARE SOLUTIONS

Henssgen's premium product line offers the ideal solutions for snaps, rope and chain rigging, and other similar hardware solutions across industries, including products for many common agricultural applications. Our rigging hardware is primarily used with cable, chain, leather, nylon straps, rope, and wire rope.

Our curated selection of materials includes steel, stainless steel, malleable iron, die-cast zinc alloy, and solid brass, each of which we've found to offer better quality and overall value, aligning with our clients' needs. Whether your priority is tensile strength, corrosion resistance, or some combination, our staff can help guide you to the appropriate material for your stock or custom hardware order.

You can check out our [online shop](#) and call our team at 800-833-9598 to discuss your specific hardware needs with a knowledgeable staff member. You may also [contact us online](#) or [request a quote](#). We're happy to answer any of your questions.



ABOUT HENSSGEN HARDWARE

Henssngen Hardware was established in 1978 to bring quality rigging hardware to American distributors and manufacturers from our overseas factories in Germany, Taiwan, and Italy (special order products). We stock over 100 different styles of the most popular snap hooks, pulleys, quick links and assorted hardware in all sizes for Farm, Home, and Sport, and have many more items available.

Henssngen Hardware's full service warehouse in Upstate New York provides warehousing and distribution services from shipping to receiving and from invoicing to accounts payable. For more information about our location and space available, please [contact us today!](#)

CONTACT US NOW

SHOP NOW

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