FAQ: Frequently Asked Questions on Nails

Tree Island Steel has been manufacturing nails in North America since 1965. Our nails are synonymous with quality and value in the construction and homeowner marketplace. Tree Island Steel nail brands include: Tree Island®, Halsteel®, and TrueSpec®.

This FAQ sheet was created by Tree Island Steel in 2012 and appeared on the www.treeisland.com website at that time. The FAQ sheet was designed to provide our nail users with detailed information on nails, including the terminology used in the industry.

FAQs on Bulk Nails and Collated Nails

When referring to nails what is a "penny" or "penny weight"?
What does the "d" mean on nails?
Does the "penny weight" or "d" tell me the length?

The penny weight of a nail refers to the price for a hundred nails in 15th century England. The larger the nail, the more "pennies" are required to purchase 100 of them. Today, the penny weight is commonly, and many times, incorrectly used to refer to the length of a nail. The symbol penny weight is "d", from the Latin word "denarius", roughly translated as coin (penny). A 2d (penny) common nail is 1" long. Each 1d (penny) is assumed to be an increase of 1/4" of length up to a 16d (3 1/2"). After 16d, nails jump to 20d (4") and increase in length by 1/2" by multiples of 10 (20d, 30d, 40d etc.) Nails longer than 6", are correctly referred to as "spikes" and identified simply by their length. The penny weight/length is not the same for ALL nails (eg. bulk "sinker" nails and many gun nails) and is not uniformly employed by all manufacturers. To avoid confusion it is best to call for a nail by the specific length and diameter.

What is a common nail? What is a box nail? What is a cooler nail? What is a sinker nail? What is the difference between a common, box, cooler and sinker nails?

Common nails have larger diameter shanks (shaft) than box, cooler or sinker nails of the same "penny weight". The heavier shank allows them to carry higher structural loads.

Box nails have lighter (smaller diameter) shanks. They were originally designed to reduce splitting when used to assemble wooden "boxes". The lighter shanks also meant that you received more nails (count) in a 50lb keg or carton.

Cooler nails were designed to be installed by automatic equipment in wood and had a coating that made them easier to drive (vs. box nails). The coating (vinyl) "melts" when it was driven into the wood (through friction heating) lubricating the nails for installation by pneumatic equipment (air nailers) and the coating bonds the nail to the wood when it "cools", thus, the

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name "Cooler". The light shanks and coating on cooler nails made underpowered equipment more effective and, like the box nail, reduced splitting.

Sinker nails are also commonly vinyl coated. They get their name from the flat countersunk head that makes them easy to drive flush and beyond flush: counter-"sinking" them into the wood. The shanks are lighter than "common" nails but heavier than "box" or "coolers", and they are slightly shorter, by penny weight, than a common nail. The idea being, you could easily drive them deeper than other nails and that the shank would thus penetrate further than if using a flat head nail, like a common, box or cooler nail. Most sinkers (bulk) also have a checkered head making them easy to drive with a mill faced hammer at odd angles. The coating is intended function in the same way that the coating works on a cooler nail. The heavier shanks make them a better choice for use in wood structures.

If my prints call out a common nail, can I substitute a box, cooler or sinker nails?

First, no substitution should be made without prior approval from the Engineer of Record. That said, an Engineer may be willing to allow a substitution for a lighter shank nail in favor of additional nails per connection or a tighter pattern. Some misinterpret language like "box nails may be substituted unless otherwise specified". This reference does not allow for the use of shanks that are lighter than that specified. The language was added as pneumatic nail guns gained popularity. Early nail guns were only capable of "shooting" nails with lighter shanks. Today more efficient and powerful nailers are, for the most part, capable of driving nails with "common" shank diameters. The shank diameter or equivalent, as specified by the "penny weight" for a common nail, is still required unless proper approval for a substitution has been granted.

How does a ring or screw nail work?
Which is better? A ring or a screw nail?

A screw nail has a spiral thread rolled into the shank. It looks much like a regular screw. The nail twists and rotates as it is driven into the wood. As it spins into the wood, it twists the wood fibers increasing resistance to withdrawal (pull out). A screw nail is best for hard wood and if a threaded nail with a hot galvanized finish is required, the screw nail is commonly preferred. The screw nail resists withdrawal all of the way out, when being pulled. This is why screw nails are preferred for wood shipping "pallets" and common on wood construction projects.

A ring shank nail incorporates annular rings that force the wood fibers into the direction of the point before locking them into the rings. Ring shank nails provide excellent resistance in soft wood but may be hard to drive in harder wood species. A hot galvanized coating will flow into the rings and may reduce the holding power of a ring shank nail. Ring shank nails have very high initial withdrawal resistance, but once the wood fibers release the nail is easily removed. This is why they are used in many crating applications as well as wood framing and sheathing.

Most building codes recognize both ring shank and screw shank equally and accept either interchangeably as "threaded" nails.

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What is a Bright or Brite nail?

Bright (or brite) refers to "bright basic". Bright nails are not coated with a protective finish and are not recommended for exterior exposure or use in treated lumber (ACQ) applications.

What is a Phosphate Coating?

Phosphate coating is added to nails to ease penetration in the wood and increase holding power. It offers no protection against rust and corrosion.

What is ZincGard®?

Zincgard® is the trademarked name for the Tree Island Steel process for producing hot dip galvanized nails. The first step in making the best hot dip galvanized nail is to begin with a full dimension nail that is drawn to a specific strength requirement. Bright nails and a predetermined amount of zinc chips are loaded in a rotating drum furnace, where they are heated to a temperature exceeding the zinc melting point. Zinc chips melt forming a suspended molten zinc bath which is rotated with the nails, and centrifugal force is applied. A metallurgical reaction occurs between the nail surface and molten zinc forming a strong continuous and even bond. To complete the process and cure the finish, the nails are immediately quenched in cold water. The ZincGard® process forms a hot dip galvanized coating which consist of an Iron-Zinc alloy bonding layer and pure Zinc outer layer, reinforced by evenly distributed Iron-Zinc alloy particles. The ZincGard® process provides a coating which is an excellent combination of ductility and abrasion resistance. Cooling water is then treated to remove potential pollutants and recycled.

How does Zincgard® protect steel nails from corrosion?

If unprotected, steel will corrode in nearly any environment. ZincGard® stops corrosion by providing two types of protection:

- *Physical Barrier*
- *Cathodic Protection*

Physical Barrier:

The ZincGard® coating provide a continuous, impervious barrier that prevents moisture from coming into contact with the steel. Unless the steel comes into contact with moisture or dissimilar metals, there is no reason to expect corrosion. Zinc will gradually erode, but has a much longer life than uncoated steel when exposed. Zinc is a highly durable physical barrier and is especially suited for nails that will be struck with a hammer or the driver of a nail gun for installation.

Cathodic Protection:

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Zinc deposited during the ZincGard® process galvanically protects the steel from corrosion (red rust). Should bare steel be exposed to moisture or other corrosives, the steel is protected by the sacrificial loss of zinc (white rust) in the vicinity of exposed steel. In the immediate presence of zinc, steel will not corrode until all the zinc has been sacrificed. Thus, it is safe to say that the weight of zinc coating has a direct relationship to the useful life of a fastener in a specific environment.

When a fastener corrodes it loses load carrying capacity. A heavy coat of zinc extends the life of your project.

What is the difference between ZincGard® and "Double Hot Dip Galvanized"?

Much like the name "ZincGard®", "Double Hot Dipping" is a branding of the specific hot dip galvanized process employed by others. While we do not know the exact process used, what we do know is that the corrosion resistance of a hot dip galvanized nail rests primarily on how much zinc is actually on the nail. Double dipping the nail may make for a uniform coating, but it does not "double" the weight or thickness of the zinc. ZincGard® nails meet or exceed ASTM A153 Class D Standards for coating weight.

Why do I have to use a hot galvanized nail in treated lumber and ACQ?

ACQ replaced CCA treated lumber. CCA was an arsenic-based wood preservative. ACQ (Alkaline Copper Quaternary) replaced CCA to remove health risks associated with arsenic. ACQ is highly corrosive due to high levels of copper. The transition to ACQ treated lumber initially caused major problems. Even though suppliers of treated wood had long recommended hot dip galvanized fasteners, the recommendations had been mostly ignored. The industry took notice when exterior decks and railings started failing. Many homeowners were hospitalized with injuries when decks and/or railings collapsed. Property damage reports from failed pole buildings have also been recorded. The International Building Code and the International Residential Code both require all connections to and through treated wood (other than Borate) to be fastened with ASTM A153 Class D Hot Dip Galvanized or stainless steel fasteners.

Certain preservative treatments for wood may be highly corrosive. Consult the manufacturer/supplier for pertinent information and their fastener recommendation.

Are there times when a ZincGard® nail should not be used?

ZincGard® and other hot dip galvanized nails may not be the best choice for use with cedar, redwood or cypress. Extracts that occur naturally in these wood species can cause black streaking as the oils react with the zinc and steel. Wet wood aggravates this condition.

No steel nail, with or without zinc coating, should be used where it could come into contact with stainless steel or other dissimilar metals.

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What is Electro-galvanized?

Electro-galvanized (clear zinc – silver, yellow incandescent galvanized - YIG) nails are better described as electroplated. The coating of zinc is very thin and provides minimal resistance to rust. The finish is primarily a barrier coat and quite fragile. They are bright and shiny, but should not be used where they will be exposed to corrosive elements or be contact with treated lumber.

What is a barrier coating /ceramic coating/ zinc aluminum polymer coating?
What is "Exterior galvanized"?

All of the proprietary coatings that we have observed or inspected have been found to be zinc rich paints (coatings). These coatings are either organic or inorganic. When the finish is heated or "kilned" they are often called "ceramic". To function as promised the zinc dust must be concentrated enough to provide for electrical continuity in the dried coating. If not, cathodic protection will not occur. Even in high concentrations, there are questions as to whether cathodic protection is possible at all due to the encapsulation of the zinc particles in the binder of the coating. Without cathodic protection, the coating performs little better than basic paint and can easily be damaged when installing the fastener. Some of these coatings make elaborate claims pointing to salt spray tests and offering extended warranties. Buyer beware. One such warranty was made invalid if installed in wet wood. Based on our own tests and observations, a majority of barrier coatings are compromised when the nail is installed.

When should I use stainless steel nails?

Stainless steel nails are recommended for structural connections that are going to be continuously exposed to ocean salt air, de-icing salts and chemicals, fire retardants, fertilizers, soil, acid rain, and other highly corrosive environments.

Stainless steel nails should be used anytime the fastener will come in contact with other stainless steel products (structural metal connectors, etc.)

Certain preservative treatments for wood may be highly corrosive. Consult Tree island Steel for pertinent information and fastener recommendations.

What is the difference between 304 and 316 stainless steels?

304 and 316 stainless steels are two of the most common grades of stainless steel. Both 304 and 316 grades are non-magnetic. Stainless steel (304 and 316) are a combination of steel, chromium, nickel, and in the case of type 316, molybdenum. Grade 316 stainless is a better choice for coastal/marine exposure than 304.

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What is ICC?
Is ICC the same as ICBO?
What does an ICC ESR report tell me?

ICC-ES is the International Code Council Evaluation Service. The ICC-ES performs tests to confirm the code compliance of building products (to the properties established by ASTM and NDS). Builders, contractors and specifiers (Engineers) have confidence in products that have current and valid ICC-ES reports.

You can confirm the validity of an ICC-ES ESR report on line at
http://www.icc-es.org/reports/index.cfm?search=search

ICC was founded by ICBO (International Council of Building officials), BOCA, and the SBCCI. The original mission of ICBO is being carried out today by the ICC Evaluation Service. Many ICBO report holders have been granted legacy reports allowing them time to secure ICC reports.

What is ASTM?

The American Standard for Testing Materials (ASTM) publishes the minimum standards for many products. Nails and other fasteners are among the standards published. These standards include the dimensions of nails as well as mechanical properties, such as bend yield.

What is bend yield?

Bend yield is an important measure of the effectiveness of a nail. The shear value of a connection is a function of the nail withdrawal and bending resistance. When a fastener fails it first bends and then withdraws. The movement in a connection of only 3/8 of an inch is deemed "failed". This failure allows penetration of the structure by moisture and or pests.

TrueSpec® Head Identification System FAQs

What is TrueSpec®?

The TrueSpec® head identification system is the only collated nail with the head stamped and colored to ensure the correct nail is used for the intended application to ensure structural integrity. TrueSpec® reduces 'wrong nail' issues and increase efficiency. TrueSpec® nails are available in Plastic Strip or Paper Tape in Common, Box, Ring, Screw or Teco (Hardware).

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What guns do TrueSpec® nails run in?

TrueSpec® nails are currently available for tools that run 20-22 degree plastic strip collated nails and 31-34 degree paper tape collated (MCN) hardware nails.

TrueSpec® plastic strip nails are collated with virgin (un-recycled) plastic. This plastic performs consistently in a wide range of temperatures and allows the use of less plastic while still delivering durable strips. The TrueSpec® hinge (the space between the nails), head and nail spacing are engineered to cause nails to break away cleanly when the trigger is pulled and the nail driven, allowing the next nail to move completely into the drive position. This makes TrueSpec® nails run more consistently with fewer jams and "skips". It also means that two strips can be loaded in your tool without causing nail jams or skipping. If you try this with many competitive products your skips, jams and repair frequency can increase dramatically.

TrueSpec® hardware nails are collated with rigid tape and the tips are coated with a highly visible coating to help locate the holes in structural metal connectors. To install the nail without damaging the hardware, the nail needs to be driven as straight as possible. Our tape, along the adhesion and the dimensional consistency of our nail, make this possible.

Why don't TrueSpec® nails with ZincGard® have paint on the head?

We chose to add the alpha character onto the head of our TrueSpec® nails with ZincGard® rather than paint the head. Had we painted the nail head, dealers would be forced to have duplicate inventories of nails, for example non-head ID nails for decks, fences, exterior trim and fascia, and duplicate inventories of head ID nails for structural applications. The same problem would exist for contractors. We also had concerns regarding single wall construction applications, where a nail with dark green paint on the head could be hard to cover with one coat of paint. The alpha numeric stamp makes it clear that the correct hot dip galvanized nail was installed.

Are stainless steel nails available in TrueSpec®?

TrueSpec® head ID nails are not currently offered in stainless steel. If you would like to see them made available, please email: sales@treeisland.com and tell us. Stainless steel nails are available in a wide variety of sizes in our Halsteel® brand of nails.

Are TrueSpec® nails made in the USA?

Bright TrueSpec® gun nails are made and collated in the USA. Tree Island Steel/Halsteel® collated nails are made (forged) and collated in Ontario, California.

Hot Galvanized ZincGard® nails are forged and galvanized at the Tree Island Steel facility in Richmond, B.C. Canada. The finished bulk nails are then shipped to Ontario, California for collating. These nails are NAFTA compliant.