



GalvaBar FAQs (from GalvaBar Introduction Presentation)

Can I get a sample of GalvaBar to share with a potential customer?

Samples of GalvaBar are available ready-to-ship from our Catoosa facility, either straight or bent. If you'd like to arrange for a sample to provide potential customers a look at our product, please contact Michael Ezell (michael.ezell@cmc.com).

Can you Weld GalvaBar?

According to the CRSI Manual of Standard Practice reinforcing steel should be welded according to the American Welding Society, AWS D1.4/D1.4M Structural Welding Code - Reinforcing Steel. If the steel used for the coated bars meets ASTM A706/A706M, the bars are intended for welding without preheating and therefore should be specified for applications that require an appreciable amount of welding. ASTM A615/A615M reinforcing bars can be welded but may require preheating the bars up to 500°F [260°C].

Galvanized reinforcing bars may be welded in the field with the approval of the LDP. Welding of galvanized reinforcing bars should conform to AWS WZC/D19.0, which calls for welds to be made on steel that is free of zinc adjacent to the weld to prevent strength reduction through zinc inclusion in the weld itself. The zinc coating should be removed at least one inch [25 mm] from either side of the intended weld zone and on all sides of the bar by grinding or equivalent means. Once the weld is completed, the zinc coating in the area of the weld should be repaired using procedures described in ASTM A780/A780M. Fumes from welding galvanized reinforcing bars may contain zinc, iron and other potentially noxious substances, and proper ventilation that minimizes worker exposure to fumes is essential. The specific precautions are found in ANSI/AWS Z49.1 Safety in Welding, Cutting and Allied Processes. Tack welding is not permitted.

After completion of the welding on galvanized bars, the damaged areas should be repaired using patch materials meeting ASTM A780/A780M.

Why doesn't GalvaBar crack and what is the difference between "Air Wipe" Galvanized, Hot Dip Galvanizing (HDG) and GalvaBar?

The innovative processing of CMC GalvaBar, ASTM A1094, produces a thick and ductile pure zinc layer that allows for fabrication after processing. The GalvaBar process inhibits the development of iron in the zinc coating which is why you can count on fabricating GalvaBar after processing.

Zinc-iron alloys which form in traditional "batch" galvanizing are brittle and very susceptible to cracking and flaking. The "batch" process is steel chemistry reliant and produces heavy zinc-iron alloy layers. Silicon and phosphorous levels in steel rebar as well as dwell time and zinc bath temperature can produce the thick brittle zinc-iron alloy layers. These zinc-iron layers, when exposed, also contribute to stress cracking in concrete.

Hot Dip Galvanized rebar ASTM A767 Class 1 or traditional “batch” galvanized rebar is fabricated then galvanized developing a thick zinc-iron alloy coating which has very little pure zinc on its surface. “Air Wipe” or ASTM A767 Class 2 goes through an air wiping process after galvanizing that freezes some additional pure zinc on the outer layer making it slightly more ductile than ASTM A767 Class 1, but still susceptible to cracking and flaking.

How much does GalvaBar add to the theoretical weight of “black” bar?

GalvaBar is within the theoretical weight of rebar, so no added weight is contributed. Traditionally galvanized rebar can add 6% to 8%.

Does GalvaBar use Hydrochloric acid before flux?

No, our GalvaBar process does not utilize chemical cleaning processes like Hydrochloric and Sulfuric acids that can be hazardous or environmentally regulated. We use an abrasive cleaning process for optimal surface preparation.

What are the sizes available from GalvaBar and can the GalvaBar process galvanize smooth bar?

Yes, CMC GalvaBar can process smooth rounds, threaded bar and even some deformed wire in sizes in straight lengths from 20’ to 64’ and #3 to #11 (.375 to 1.375”). For #3 rebar, only 40’ lengths are processed.

Are there any limitations to fabrication equipment for GalvaBar?

No, any standard fabrication equipment made for rebar that is equipped to fabricate to ASTM specifications (A615, A706, A996 or A1035) and standard industry practices.

Is segregation of Galvanized Coated Rebar (1094 or 767) from Standard Rebar 615 required? Will storage staining occur?

- Coated steel reinforcing bars should be stored off the ground on cribbing, and timbers placed between bundles when stacking is necessary.
- Coated and uncoated steel rebar should be stored separately to avoid superficial staining.
- Uncoated steel banding stored outside for extended periods will superficially stain galvanized rebar. Galvanized banding or fiber reinforced banding, where applicable, can be used for outside storage indefinitely.
- DOT’s may have additional guidelines to follow.

What type of wire ties should I use for GalvaBar?

When placing galvanized steel reinforcing bars, all bar supports and tie materials should be galvanized, coated with dielectric material, plastic or precast.

Is touch up of GalvaBar necessary given properties of zinc?

If the coating has been locally dissolved, or mechanically damaged such that the underlying steel is exposed, the remaining zinc on the adjacent surface becomes anodic and provides sacrificial cathodic protection to the exposed steel and corrosion is further delayed. The extent of coverage afforded by this reaction depends on many factors but primarily the conductivity of the nearby environment, i.e. the concrete pore solution. Experimental data has shown that in sand-cement mortars with a water to cement ratio of about 0.4, exposed steel to a distance of about 0.3 in. [8 mm] is protected by the presence of the zinc.

In-place coated steel reinforcing bars should be inspected for coating damage prior to placing concrete. Where damage exists, it should be repaired with a zinc-rich formulation complying with Specification A780/A780M.

Areas of uncoated steel should be coated prior concrete placement. When the extent of coating damage exceeds 1% of the surface area of the coated steel reinforcing bar in any one-foot [0.3-metre] length, the coated bar should be rejected. When the extent of the damage does not exceed 1 % of the surface area in any one-foot [0.3-metre] length, all damaged coating discernible to a person with normal or corrected vision should be repaired with a zinc-rich formulation complying with Specification A780/A780M.

Repair material should be applied in strict accordance with the written instructions furnished by the repair material manufacturer. Prior to application of the repair material, rust should be removed from the damaged areas by suitable means. The repair material should be allowed to cure before placing concrete over the coated steel reinforcing bars.

Are there precast applications for GalvaBar?

GalvaBar is well-suited for Precast applications where customers rely on quality, performance, and an excellent corrosion resistance. The key to this is that cracking and rust staining of exposed concrete must not be allowed to occur where high quality materials and construction methods are usually employed. To this end, GalvaBar in precast cladding panels, facades and exposed structural elements can be widely used to ensure a long, trouble-free life.

Galvanized reinforcement is ideally suited for use in all types of thin and lightweight concrete construction.

Tilt-up panels are another good example and ferro-cement construction in applications such as shelters, boats, pontoons and marine buoys where galvanized wire or mesh is often employed. The reasons for this are straightforward. Where the cover is intentionally reduced and/or thin elements may crack, corrosion protection afforded by zinc coating ensures the reinforcement does not prematurely corrode.

In a combined installation scenario of Galvanized Coated Rebar (1094 or 767) + Standard Rebar 615 in the same or connected concrete assembly how much separation is required?

When galvanized reinforcing bars are used in concrete, they should not be directly in contact with uncoated steel reinforcing bars, copper or other dissimilar metals. If required, polyethylene spacers or

similar dielectric tapes can be used to provide insulation between galvanized bars and other dissimilar metals.

Is development length changed when using galvanized reinforcing steel?

No. The development length used in design is the same as that for uncoated bars.

Concrete tightly adheres to galvanized reinforcement that may provide adhesion better than that achieved with uncoated steel due to the formation of a surface layer of calcium hydroxide.

Bond (pullout) strength of reinforcement in concrete is determined by a combination of mechanical interlock between the concrete and the deformation ribs on the surface of the bar, adhesion between the bar and the concrete and frictional resistance along the surface of the bar as slip commences. With conventional deformed bar, mechanical interlock where the concrete bears against the raised rib pattern is the primary factor determining bond strength. However, the level of adhesion between the bar and the concrete provides additional bond strength.

Is it better to lap splice or mechanically splice galvanized reinforcing bars?

Galvanized reinforcing steel may be spliced using either lap splices or mechanical splices. Use of the method depends on many factors and this will likely become an economic decision. For the smaller bar sizes, the length of galvanized steel bars to facilitate the lap splice requirements will likely be less expensive than the selected mechanical splice. For the larger bar sizes, the coupler becomes more economical than the length of bar used to make the lap splice. A mechanical splice may, however, be a better alternative given job specific constructability conditions, congestion issues, and/or spacing requirements. ACI 318 Building Code Requirements for Structural Concrete or AASHTO LRFD Bridge Design Specifications provisions may also influence this decision.

What types of mechanical splices are available?

Many mechanical splices are commercially available in standard size threaded couplers. Some of these are galvanized, while others are left uncoated and protected using a waterproof sleeve at the jobsite that is placed tightly around the ends of the bars and the couplers to prevent moisture intrusion. As with any mechanical splice, test 165 data should be utilized to determine suitability of available products.

Are there any issues to using mechanical splices with galvanized steel bars?

When mechanical splices are used, they should be inspected for zinc coating damage prior to placement of concrete. If damage is observed, the steel should be cleaned to remove any surface corrosion and coated with a repair material that meets requirements of A767/A767M or A1094/A1094M.

What is the GalvaBar tagging process/what information is on the tags?

1. Upon delivery, the heat number, bar sizes, number of bundles, grade, pcs and length are verified against the customer supplied BOL or packing list. Any discrepancies are communicated by the CSR to the customer.
2. Damages are communicated via email noting the above agreed upon option to the customer.
3. Each bundle is processed so that each piece remains in the original bundle. The mil tag if intact is reattached along with a new CMC label with corrected information as necessary.
4. Prior to shipment each load inspected per ASTM A1094 and copies of the original Mill Cert, CMC Coating Thickness Report and CMC Certification to ASTM A1094 are supplied with each load.
5. Upon shipment, the forklift operator verifies each CMC tag against the CMC BOL for shipment verification prior to loading.
6. CSR to email customer confirming shipment of materials. CSR and/or SM is to follow up with each order to verify delivery, quality, service, etc. Timing on follow up will vary contingent on materials received and job start.

Does GalvaBar compete with ChromX?

All Commercial Metals Company corrosion resistant reinforcement options have applications and benefits unique to their customers.

What is the Annual Tonnage capacity for GalvaBar?

GalvaBar annual tonnage capacity is 30,000 tons.

What are 1035 vs 1094 research service life variations?

Service and Design life estimates for GalvaBar based on our current research are nearing completion. We expect to report the great news very soon.

What are the cost variations?

Pricing has been sent out to each region. If you need additional assistance, then please contact the GalvaBar Area Sales Manager responsible for your area.

Is GalvaBar a Patented product?

No, but the GalvaBar process is patent pending.

What is the contribution to LEED (EPDs)?

Stay tuned, our work is in process here to explain LEED, Life Cycle Cost Analysis and EPD's.