



**Bridgeport Fittings Summary Interpretation Comments:  
American Recovery and Reinvestment Act of 2009  
Buy American Act**

***ZINC Commentary***

The interpretation comments provided herein are solely based on Bridgeport's research pertaining to the American Recovery and Reinvestment Act (ARRA) of 2009 and the Buy American Act. Every attempt has been made to accurately portray the information herein but please be advised the following is our interpretation of the various acts. The actual ARRA and Buy American Act should be consulted for accuracy and fact; ultimately these documents and those individuals responsible for implementing requirements, have the final say as to what is permitted and what is not permitted.

This document covers the ***ZINC as an Acceptable Material*** commentary; there are three commentary sections available:

- **General:** This section highlights the ARRA and Buy American Act
- **Buy American:** Pertains to the requirement to Buy American and Construction Materials
- **Zinc as an Acceptable Material:** Dialogues Federal Specification Acceptance of Zinc

**ZINC AS AN ACCEPTABLE MATERIAL**

*Think Zinc.* There has been considerable discussion regarding the acceptability of various materials used in the manufacture of construction materials for government funded type of projects, including construction for military facilities, government buildings (federal, state, local), schools, etc.

While 'steel' electrical conduit and cable fittings are generally specified for specific projects, there is ***no reference of exclusion*** for any material including ***Zinc*** as an acceptable material in neither the ARRA nor Buy American documentation published by the U.S. Government. In fact, Federal Specifications clearly permit the use of ZINC alloy as an acceptable material provided its material composition meets a specific ASTM specification (see reference point below: *Zinc Conformance to Specifications*). Specifically:

- There is no exclusion of reference of 'Zinc' as a material for any manufactured good for construction;
- There is no specific 'product' referenced in any document pertaining to manufactured goods for construction;
- There are references to 'steel' and 'iron' as general references for 'construction materials'; this reference does not refer to any *specific product* but refers to steel or iron used in the construction of a building/structure;
- Every reference to 'steel' or 'iron' is followed by "and Other Manufactured Goods".



## **Zinc vs. Steel**

*Think Zinc.* A perception exists that steel fittings will outperform similar type fittings manufactured from die cast zinc; this perception is untrue. What most distributors, contractors, specifiers, engineers, etc., do not understand about zinc is the following:

- Zinc Meets or Exceeds the Same Stringent UL514B Fitting Standards as Steel
  - The same parameter test requirements are used throughout the testing and listing procedure by U.L., C.S.A., etc., regardless of material;
  - Zinc meets the same application requirements of the NEC, regardless of material;
  - Zinc meets the same Federal Specifications (A-A-50553, A-A-50563, and ANSI/NEMA FB-1) regardless of material.
- Dimensional Consistency
  - High quality 99.5% pure, ASTM B86 certified, zinc alloys used by Bridgeport Fittings are unique in their ability to hold very close manufacturing tolerances;
  - Consistency is guaranteed from on manufacturing run to the next;
  - Consistent performance facilitates ease of assembly and installation.
- Inherent Corrosion Protection
  - Zinc alloy fittings do not require a protective coating because the protection goes all the way through;
  - Corrosion resistance of Bridgeport's fittings is enhanced by a special burnishing process, which closes surface porosity and gives the fittings their characteristic shine.
- Functional Advantages
  - Ease of assembly due to inherent surface smoothness and lubricity not found in steel or zinc-plated steel fittings;
  - Ball-burnished finish reduces mechanical friction and sharp edges;
  - Matched and engineered components provide greater mechanical compatibility and performance;
    - For example, Bridgeport's unique zinc die-cast locknut is perfectly matched to the zinc fitting – the result of this attention to detail is a locknut that can be secured with a single spin.
- The Unique Locknut
  - Two full cut threads won't jump connector threads when fully tightened and UL Listed for use inside and outside the box;
  - Reversible and fast threading to promote a trouble free, time saving installation;
  - Serrated design provides for increased continuity and has the ability to remove most non-conductive coatings;
  - Extra tightening lugs accessible from all angles facilitate a trouble free installation.



## **Zinc vs. Steel (cont'd)**

- Deep-slot, Tri-Drive Screws
  - Captive, Tri-Drive screws are engaged flush with the fitting body ID to allow for quick installation and prevent disassembly while in transit;
  - The Bridgeport Tri-Drive head provides maximum flexibility to use the most available drivers (Phillips, Straight Blade, and Robertson Square);
  - Screw size and length are specifically designed to handle significantly higher torque loads than required by UL514B;
  - Screw tip design is engineered to achieve the maximum pull-out rating that UL514B requires;
  - Set Screws are manufactured from a heat treated steel alloy, engineered to control the hardness (hardness is important as it significantly affects how much the setscrew 'bites' into the conduit and creating a reliable and strong connection), and plated with a high-quality zinc plating.

## **Zinc Conformance to Specifications:**

*Think Zinc.* Zinc, as a material used in the manufacture of electrical conduit and cable fittings, conforms to a number of specifications, and is referenced as an acceptable material in Federal Specifications. Specification references to Zinc include:

- **Federal Specifications**
  - **A-A-50552** COMMERCIAL ITEM DESCRIPTION FITTINGS FOR CABLE, POWER, ELECTRICAL AND CONDUIT, METAL FLEXIBLE
  - **A-A-50553** COMMERCIAL ITEM DESCRIPTION FITTING FOR CONDUIT, METAL (THICK-WALL (RIGID) AND THIN-WALL (EMT) TYPE)
  - **A-A-50563** COMMERCIAL ITEM DESCRIPTION CONDUIT OUTLET BOXES, BODIES, AND ENTRANCE CAPS, ELECTRICAL: CAST METAL
  - Web link to Bridgeport Fittings website contains a highlighted reference as to the acceptability of ZINC as a material used in the manufacture of fittings:

<http://64.194.229.188/images/whatsnew/Federal%20specification%20for%20EMT%20and%20Rigid%20Conduit%20Fittings.pdf>

- Specific reference notes from the Federal Specification document A-A-50553 supporting the acceptability of zinc as a material:
  - Reference 2.6 Material: Table II. Fitting Material, "Material Code Z" for Zinc Alloy;



## Specifications (Cont'd)

- Reference 3.1 Materials: "...Fittings made from die-cast zinc shall conform to ASTM B86, 'Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings', to which Bridgeport Fitting's alloy conforms to.
  - Reference 3.2 Electrical Characteristics: "The fittings shall conform to the requirements of Underwriters Laboratories (UL) standards for safety UL 467, "Grounding and Bonding Equipment", and UL 514B, "Fittings for Cable and Conduit", as applicable.
  - Reference 4.1 Recovered Materials: "...encouraged to use recovered materials the maximum extent practicable, in accordance with paragraph 24.403 of the Federal Acquisition Regulation (FAR)"; Bridgeport Fittings takes full advantage of this by re-melting gates, runners, and scrap zinc die-castings from our manufacturing process
  - Reference 7.1 Part or Identification Number (PIN): "...Example of reference part number: AA50553 – 11D203Z identifies a type I rain tight fitting, thick wall conduit, threaded 45 degree electrical connector box, insulated throat, 1-inch, made of zinc alloy."
- 
- Third Party Specification Standards
    - UL514A
    - UL514B
    - UL467
    - CSA C22.2 18.3-04
  - NEMA Specification Standard
    - FB-1



## **Think Zinc – One Last Discussion Point**

There are many “myths” and incorrect perceptions regarding die-cast zinc electrical fittings. This document was created to present the facts regarding Bridgeport Fittings die-cast Zinc fittings. One additional myth that needs to be dispelled is the myth that all zinc die-cast is “pot metal”.

The term “pot metal” refers to a type of inexpensive alloy of poor quality, usually containing excessive lead and contaminants, and used especially in making, cheap, decorative type castings or toys.

Further, if the quality or purity of zinc alloy is not controlled and monitored, the casting may result in sub-surface porosity throughout the fittings. When this happens, the fitting becomes extremely weak and brittle.

Bridgeport Fittings zinc alloys are not pot metal. They are of the highest grade, ZAMAK™ Zinc alloys, specifically formulated for strong and consistent castings. We regularly analyze our alloy to ensure its purity, composition, and conformance to an industry alloy material standard ASTM B86 (as referenced above in Federal Specification A-A-50553). In addition, we regularly x-ray our die cast production samples to ensure there is no hidden porosity caused by a poor manufacturing process.

The basic specifications of Bridgeport’s zinc alloys are found in ASTM B86. These primary alloys, designated as ZAMAK 7, ZAMAK 3, or ZA-12, are expressly specified by Bridgeport. We only use the highest purity zinc alloys to ensure the highest quality castings.

The functional advantages of these particular alloys and their purity include increased dimensional stability, and reduced inter-crystalline oxidation in our finished castings. In simple terms, it means that Bridgeport’s fittings consistently adhere to tighter tolerances, and will not get brittle and crack no matter how long ago they were manufactured.