

Identification and Treatment of White Bronze Monuments

Many historic Oregon cemeteries include at least one monument that looks like beautifully detailed and well-maintained stone, but on closer inspection reveals itself to be metallic. These are made from zinc or its more artistic trade name: white bronze. All white bronze monuments were manufactured by the Monumental Bronze Company of Bridgeport, Connecticut or one of the firm's subsidiaries in Chicago, Des Moines, New Orleans, or Canada. The monuments are hollow, mass-produced designs that could be customized with a variety of ornaments directly added to the casting or applied later in the form of plaques. Monumental Bronze Co. produced monuments between 1877 and 1914. However, the firm continued to make plaques for preexisting monuments until 1939.

Identifying White Bronze Memorials

- Non-magnetic
- Blue-gray color
- Sharply delineated ornament and lettering
- Sound hollow when lightly tapped
- Fractures look crystalline
- Lighter than it looks
- No moss or lichen growth



White bronze monuments have a wide range of sizes, from six-inch foot stones to 35-foot-tall civil war memorials. The largest examples are rarely seen in Oregon; however, relatively large six-foot examples are not uncommon.

The manufacturing process consisted of creating a customizable pattern from plaster and wax elements. The

pattern was then pressed into a sand mold and removed, leaving behind an impression that was then filled with molten zinc. The resulting panel was then fused with other panels or elements, sandblasted for an even, stone-like texture, and chemically oxidized to create a blue-gray patina. The color is characteristic, but can vary depending on environmental conditions (ranging from very light to dark gray). Occasionally white bronze memorials consist of single panels that mimic stone tablets. However, three dimensional memorials composed of multiple castings fused together with molten zinc are more common.

In addition to custom cast ornamentation, panels also featured blank, open areas designed to accommodate plaque-like components that would be attached with ornamented fasteners (i.e. screws with fancy heads). Completed monuments are hollow and are lighter in weight than they appear to be.

Zinc monuments may be installed on top of a concrete or stone foundation. The bases of the zinc units



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have tabs that accommodate screws to fasten the monument to a foundation. Alternately, the monuments are cast directly into concrete to fix them in place. It is unclear whether this was an original installation method or whether this is the result of later alteration. However, securing monuments by sinking them into concrete is not recommended.

Issues

- Loss of Level
- Monument Creep
- Bending and Breaking
- Loss of Pieces
- Staining

Zinc monuments are remarkably durable and easy to maintain. Zinc is resistant to burning (though it will melt at 420°F); it does not rust; wind, water, and acid rain will not erode it quickly; and no moss or lichen will grow on it. Bending and breaking, loss of pieces, monument creep, staining and lack of level are issues that affect white bronze.



Like any other monument set on a stone or concrete base, white bronze monuments are subject to earth movement and may require periodic leveling on gravel. When not affixed to the base, monuments may need to be slid back into place and centered on their base before straightening.

A problem that is somewhat unique to white bronze monuments is monument creep. This is primarily an issue with larger, heavier examples that begin to settle and spread with age, developing cracks, particularly at joints. This was sometimes remedied by filling the interior hollow with concrete. This is not recommended as chemical reactions between the concrete and zinc accelerate deterioration. In extreme cases, such as the 35-foot-tall Stratford Civil War monument, an interior steel framework was installed to combat the creep. Unless monitoring indicates cracks are actively expanding, no treatment is likely necessary.

Cracks may also be caused by sharp blows from vandals, lawnmower strikes, or falling tree limbs. Zinc can bend and deform slightly, but because of its crystalline structure it tends to shatter when struck. Sometimes shattered pieces can be reassembled using non-reactive epoxies. Bent and deformed pieces can be reformed, but only gradually and over an extended period of time to avoid shattering. Heating is not recommended as Zinc fumes are toxic. As with all gravestones, prevention is much easier than repair.

- Ensure that trees around white bronze monuments are trimmed to avoid falling limbs.

- Keep landscape equipment well away from monuments and only use hand tools in their vicinity.
- Mark the location of small monuments with flags so mowers can see them despite tall vegetation.



It is common to see white bronze monuments with plaques missing decorative screws, or with plaques missing altogether. Stories of plaques being unscrewed to hide moonshine during Prohibition or even of monuments sans plaques being used as impromptu fire pits abound.



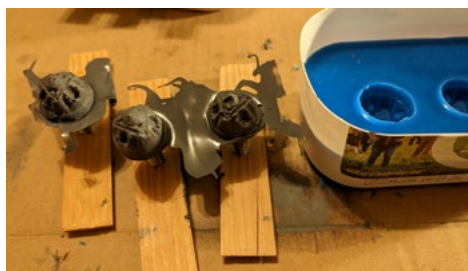
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Plaques can be recreated by casting in a variety of materials at a wide variety of price points, ranging from relatively inexpensive resin casts that can be dyed or painted to approximate a monument's color, to more expensive aluminum or bronze casts. 3-D scans and printing may become the go-to replacement method in the future. Similar techniques can be used to recreate ornamental screw heads.



Zinc is resistant to organic growth and therefore does not require cleaning to remove mosses and lichens, unlike stone. Cleaning agents may in fact cause loss of the classic white bronze patina and result in a mottled appearance. In case of mud spatter, gentle rinsing with water is all that is needed. Persistent splashing by sprinklers should be avoided as it may result in white, crusty hard water stains or loss of patina. Rust stains can result from repairing zinc with metals that trigger a galvanic reaction, e.g. copper. In general, the recommended treatment for staining is to remove the source of the stain and allow the stain to fade naturally rather than targeting the stain itself. Painting over stains or recreating lost patina with paint is not recommended.

White bronze monuments are easily some of the most beautiful and care-free grave markers. They resist wind, weather, and organic growth. Simple maintenance including leveling, trimming nearby tree limbs and avoiding lawn mower strikes will keep them looking nearly factory fresh for decades to come.

Further Reading

- Fagin, Elizabeth. *The Preservation & Repair of Cast Zinc Grave Markers*. Historic Preservation Program, University of Oregon, unpublished terminal project.
- Ivanoff, Carolyn. "Bridgeport's Monumental Bronze Company." *Connecticut Explored*, Spring 2022. <https://www.ctexplored.org/bridgeports-monumental-bronze-company/#prettyPhoto>.
- Rotundo, Barbara. "Monumental Bronze: A Representative American Company." *Cemeteries & Gravemarkers: Voices of American Culture*, Meyer, Richard E., ed. All USU Press Publications. 179. https://digitalcommons.usu.edu/usupress_pubs/179/

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