# Galvanizing

## Zn Pot Roll Bearings

Molten zinc (aluminum) is one of industry's most aggressive high-temperature environments. In the hot-dip galvanizing processes, chains, hooks, baskets, racks, trays, thermal couple protection tubes, pot roll bearings and all sorts of other immersed components can simply wear and dissolve away before your eyes! But you can minimize the problems with advanced alloys which combine resistance to molten zinc (aluminum) with excellent high temperature wear resistance.

Bearing failure is due to a combination of strip loading forces, rotational wear, and intermetallic reaction on the bearing surface. Stellite® and Tribaloy® alloys are cobalt-base alloys whose advantages are their thermal, chemical and wear resistance in a temperature range up to 800°C/1472°F. Stellite® alloys are used extensively in the production of roll bearings for galvanizing/galvanneal hot dip lines (Figure 1).

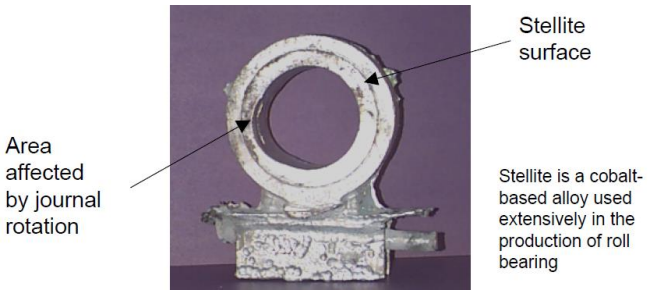


Figure 1: Liquid-metal corrosion/wear in galvanizing/galvanneal baths

| Bushing Sleeves – frequently used material combinations | |
|---|---|
| Stellite™ 6 | Stellite™ 6 |
| Stellite™ 6 | Stellite™ 4 |
| Stellite™ 6 | Stellite™ 12 |
| Stellite™ 6 | Stellite™ 3 |
| Stellite™ 4 | Tribaloy™ T800 |
| Stellite™ 6 | Ceramics |

Figure 2 demonstrates the excellent corrosion resistance of Stellite™ 6 and Tribaloy™ T800 immersed up to four weeks in continuous galvanizing (GI)/galvannealing (GA) baths.

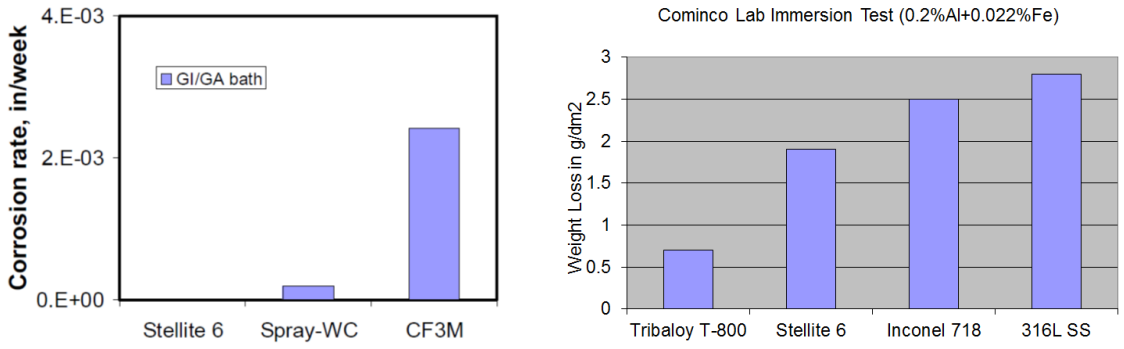


Figure 2: Excellent corrosion resistance of Stellite™ 6 and Tribaloy™ T800 in galvanizing (GI) and galvanneal (GA) baths.

| Why use Stellite™ and Tribaloy™ Alloys from Kennametal™? |
|---|
| • Premium Stellite™ and Tribaloy™ cobalt base alloy zinc pot bushings and sleeves last longer. |
| • Technical support is available from the Stellite™ materials experts at Kennametal™ |
| • Reduced friction of these materials allow for smoother, lower vibration operation |
| • Reduced operational costs by increasing submerged roll bearing life |

## Case History (1): The benefit of buying Stellite™ Components from Kennametal

A galvanizer purchased what they thought was Stellite® 4 /Stellite® 6 solid cast bearings and assembled them onto their pot roll journals. The new bearings (Cobalt 4) did not wear as well as the Stellite™ 4 materials previously used, so they took a look at the microstructure of the two materials. (See figure 3 below.)

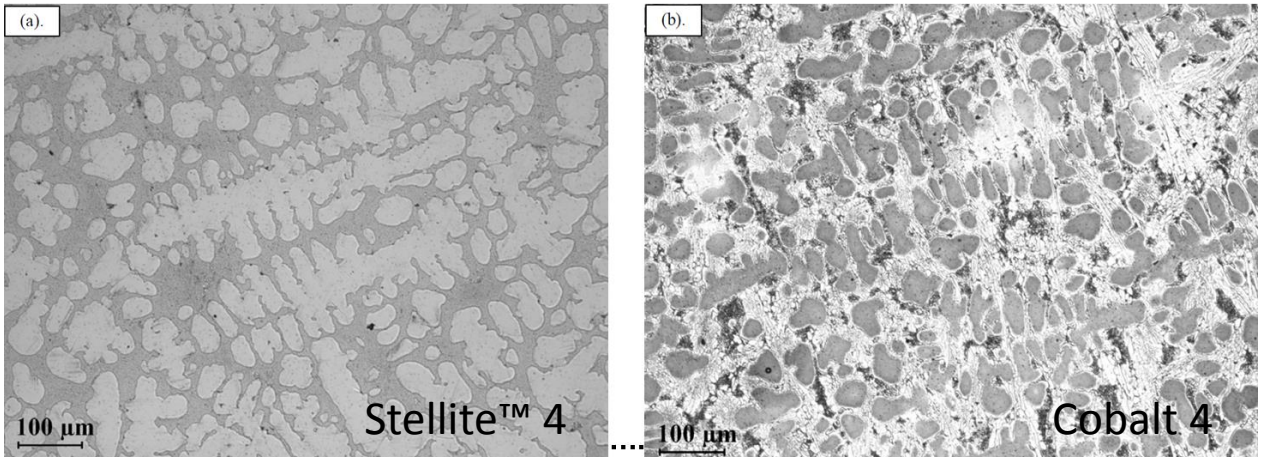


Figure 3: Polished and etched microstructures

The two samples revealed a notable difference in chemistry, microstructure and hardness. The old or original Stellite® material (left) that had better service life and had what our customer described as a cleaner microstructure. The new material (right), as described by our customer, has a "dirtier", more complex microstructure.

At Kennametal's Stellite™ foundry, we control the raw materials, chemistry, melting and casting processes. Stellite™ alloy castings are certified by our foundry to meet specification on every lot. Ensure you are using genuine Stellite™ materials … from Kennametal™!

## Case History (2): Tribaloy™ Alloy Pot Roll Bearings

### The Problem

Our customer is a worldwide renowned manufacturer of hot-dip galvanizing equipment for strip metal. Kennametal manufactures Stellite™ investment cast bearing bushings for this customer. The bushings up to this point were cast in Stellite® 6 but the customer was looking to extend the length of runs before having to change the bearings. Our experts went to work.

### The Tribaloy® solution

An optimal solution was developed, replacing Stellite™ 6 (Figure 4) castings with Tribaloy™ T800 (Figure 5) castings, which is even more wear resistant in this harsh operating environment.

### The result

A significant improvement in wear on the pot roll bearings led to significantly reduced down-time for this galvanizing line. Their customer benefitted from reduced downtime and its associated costs.

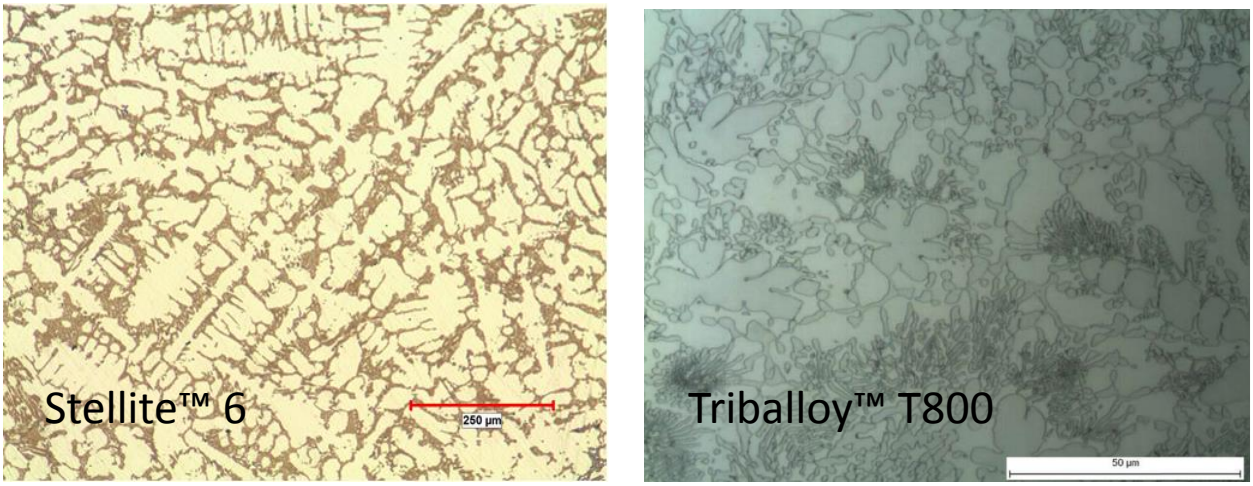


Figure 4: Microstructures



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