



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).

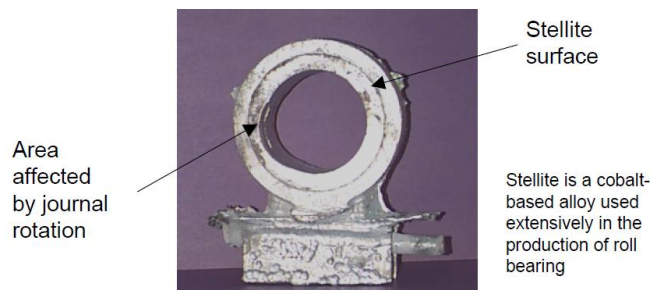


Figure 1: Liquid-metal corrosion/wear in galvanizing/galvanneal baths

Bushings 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.

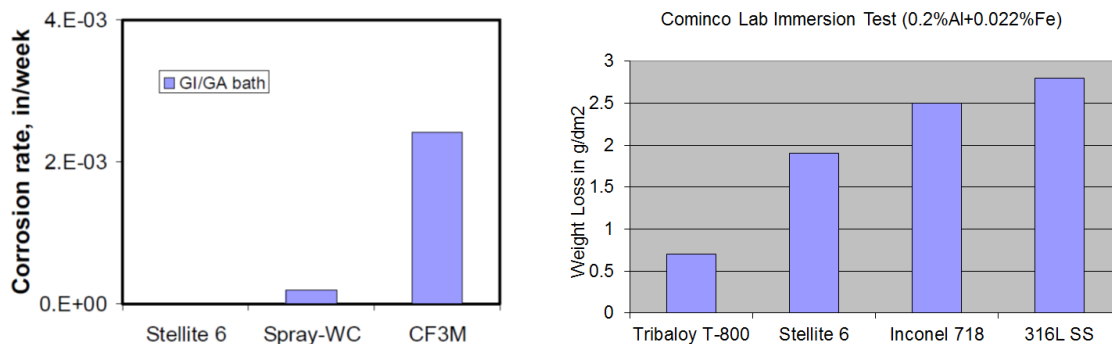


Figure 2: Excellent corrosion resistance of Stellite™ 6 and Tribaloy™ T800 in galvanizing (GI) and galvanneal (GA) baths.

### 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.)

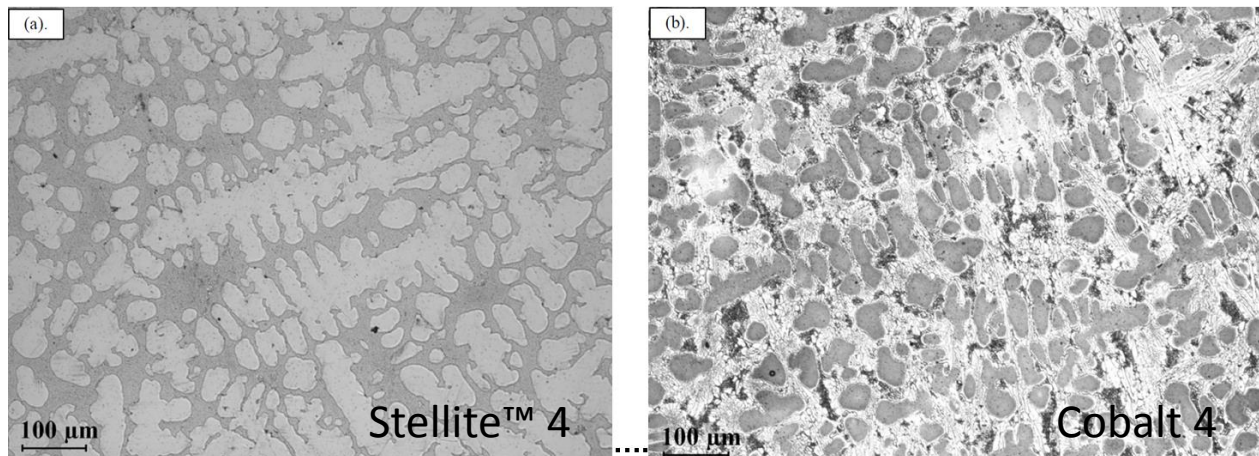


Figure 3: Polished and etched microstructures

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): Triballoy™ Alloy Pot Roll Bearings**

### **The Problem**

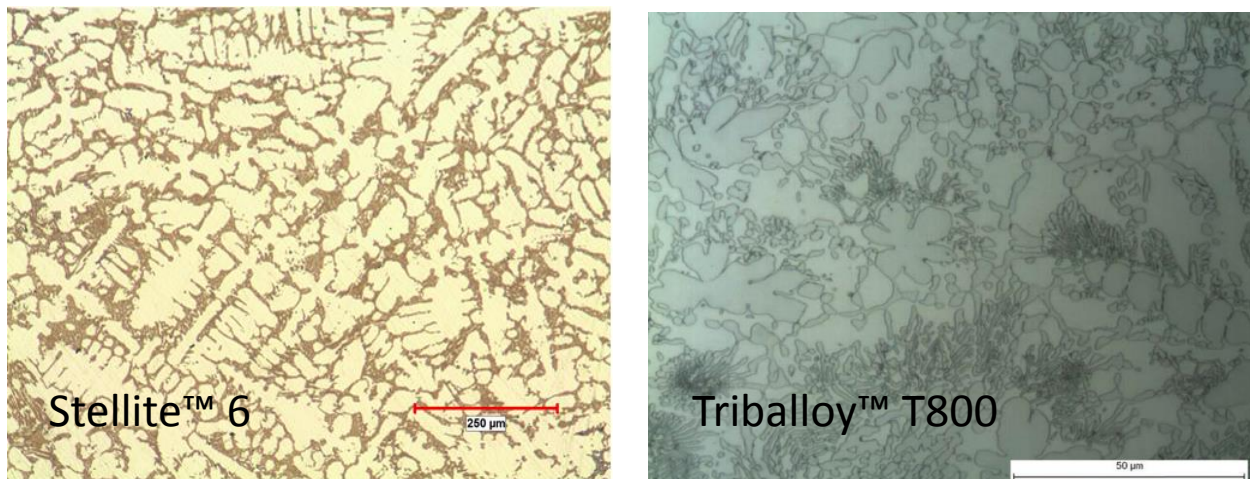
Our customer is a worldwide renowned manufacturer of hot-dip galvanizing equipment for strip metal. Kennametal manufactures Stellite™ investment cast bearing bushings for this customer. The bushings up to this point were cast in Stellite® 6 but the customer was looking to extend the length of runs before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

### **The Triballoy® solution**

An optimal solution was developed, replacing Stellite™ 6 (Figure 4) castings with Triballoy™ 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**

Kennametal® manufactures sophisticated alloys in the form of castings, powders, coatings, consumables, and machined parts that resist wear, corrosion, and abrasion. Information provided in this document is intended only for general guidance about Kennametal® products and is the best information in our possession at the time. Product users may request information about their individual use of our products, but Kennametal® does not warrant or guarantee this information in any way. Selection and purchase of Kennametal® products is the sole responsibility of the product user based on the suitability of each use. Individual applications must be fully evaluated by the user, including compliance with applicable laws, regulations, and non-infringement. Kennametal® cannot know or anticipate the many variables that affect individual product use and individual performance may vary. For these reasons, Kennametal® does not warrant or guarantee advice or information in this document, assumes no liability regarding the same, and expressly disclaims any warranty of any kind, including any warranty of fitness for a particular purpose, regarding the same. Kennametal®, Stellite™ and Triballoy™ are trademarks of Kennametal Inc.

#### **World Headquarters**

Kennametal Inc.  
1600 Technology Way  
Latrobe, PA 15560  
USA  
T 800 446 7738 (US & Canada)  
E-mail: [ftmill.service@kennametal.com](mailto:ftmill.service@kennametal.com)

#### **Americas**

Kennametal Stellite  
471 Dundas Street East  
Belleville, Ontario  
Canada K8N 1G2  
T 1 613 968 3481  
E-mail: [K-blvl.service@kennametal.com](mailto:K-blvl.service@kennametal.com)