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Introduction to Journal Section on Industrial Applications of Titanium and Zirconium

This collection of papers was taken from the 5th Symposium on Industrial Applications of Titanium and Zirconium, held 15 November 1994 in Phoenix, AZ. The symposium was sponsored by ASTM Committee B-10 on Reactive and Refractory Metals and Alloys. These symposia are intended to foster interaction between manufacturers and consumers, and to enhance the current technical and applications database on the metals.

The use of titanium and zirconium for industrial applications has truly blossomed over the last 25 years. Initially, these metals were selected for their excellent corrosion resistance. However, more recent consumer-based applications are the result of characteristics such as aesthetics, non-toxicity, and lightness (titanium). These qualities have led to applications in art, architecture, jewelry, sporting goods, biomedical devices, bicycles, and automobiles. No longer considered exotic, titanium and zirconium are finding an ever-increasing application base. The following seven papers represent some of these new areas of use. Traditional application areas are also covered, presenting new technology designed to enhance

use through novel processing techniques as well as new alloy development. The first four papers are classified as applications related, while the remaining two papers deal more with environmental behavior.

On the applications side, the papers presented here encompass a diverse topic base. The first paper addresses the biomedical use of titanium for cerebral aneurysm clips, utilizing the metal's non-toxic and non-magnetic characteristics. Next, the industrial applications of explosively-clad zirconium are detailed, followed by the third paper, which describes the new processing technology of titanium roll-clad plate. Finally, a paper on superplastic forming is presented which deals with both the development of a new titanium alloy, as well as applications utilizing the superplastic forming ability of the alloy.

The last two papers deal with corrosion-resistance behavior of the metals. First is a paper describing the corrosion of zirconium in many diverse organic media. The other outlines the performance of titanium in pure and inhibited hydrogen peroxide solutions encountered in the manufacture of pulp and paper. Hopefully, these symposium papers will allow the reader to gain insight into present and future applications of titanium and zirconium.

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