Foreword

The Fourth ASTM Symposium on Titanium and Zirconium in Industrial Applications was presented at Philadelphia, PA, 10-11 Oct. 1984. Charles S. Young, Astro Metallurgical, and John C. Durham, Timet, served as chairman of the symposium and are editors of the resulting publication.
Related
ASTM Publications

Industrial Applications of Titanium and Zirconium: Third Conference, STP 830 (1984), 04-830000-05

Industrial Applications of Titanium and Zirconium STP 728 (1981), 04-728000-05

Applications Related Phenomena in Titanium Alloys, STP 432 (1968), 04-432000-05
A Note of Appreciation to Reviewers

The quality of the papers that appear in this publication reflects not only the obvious efforts of the authors but also the unheralded, though essential, work of the reviewers. On behalf of ASTM we acknowledge with appreciation their dedication to high professional standards and their sacrifice of time and effort.

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Overview

The papers contained in this publication were presented during the Fourth Symposium on Titanium and Zirconium in Industrial Applications in Philadelphia, PA, on 10–11 Oct., 1984. The symposium was sponsored by ASTM Committee B-10 on Reactive and Refractory Metals and Alloys in an effort to extend the understanding of the reactive metals and foster a technical interaction among potential users and suppliers.

The use of these metals in industrial applications, primarily related to their excellent corrosion resistance to a variety of environments, has expanded tremendously in the last 15 years. Titanium fabrications—heat exchangers, pressure vessels, piping systems, and electrolytic cell components are commonly found in chemical, petrochemical, and utility plants. Zirconium equipment is also found in a wide range of applications that make use of its corrosion resistance. In addition to the now standard applications that have been developed, titanium and zirconium are also considered to be excellent candidates for new applications requiring their enhanced corrosion resistance. Because some of these may also require enhanced mechanical or physical properties, new alloys are being developed or new fabrication techniques designed to further extend the use of the reactive metals.

Both traditional uses (nitric acid, seawater, or chlor-alkali) and new applications (electrolytic cells) are discussed in this publication in terms of the technical reasons for using one of the reactive metals. The use of titanium in equipment designed to prevent pollution is discussed in papers on toxic waste treatment and utility flue gas desulfurization systems. New technology, involving fabrication techniques for both titanium and zirconium, is discussed as well as the physical and mechanical properties of recently developed titanium alloys. In addition, the reliability of titanium and zirconium equipment used in the petrochemical industry is reviewed, and general guidelines to ensure excellent service life are given. Also, the applications and technical requirements of other reactive and refractory metals, niobium, tantalum, and hafnium are discussed.

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