

AMPTIAC

AMPTIAC's capabilities cover the full spectrum of materials engineering including:

- Alloys
- Ceramic Composites
- Ceramic Materials
- Chemical/Biological Protection Materials
- Coatings
- Corrosion/Degradation Analyses
- Elastomeric Materials
- Electronic, Optical, Photonic Materials
- Fire Retardant Materials
- Material Applications
- Material Processes
- Material Processing Equipment
- Material Properties
- Measurement & Testing of Materials
- Metal Matrix Composites
- Monolithic Metals
- Organic Matrix Composites
- Organic Structural Materials
- Quality Control

Military, industrial, and aerospace operations continue to push the need for new equipment, components, and systems made of materials that are strong, lightweight, durable, and resistant to high temperatures. These technologies are critical in maintaining the DoD's infrastructure, from military piers and trucks to sophisticated sensors and optical systems, and in reducing defense systems' effect on the environment.

AMPTIAC supports researchers, designers, and decision makers in their efforts to enhance the performance of systems, in any environment, through proper material selection, processing, and use. AMPTIAC consists of five separate material components: ceramic and ceramic matrix composites; organic structural materials and organic matrix composites; monolithic metals, alloys, and metal-matrix composites; electronic, optical, and photonic materials; and environmental protection and special function materials.

AMPTIAC's scope includes those formerly addressed by the following IACs:

- Adhesives & Organic Matrix Materials (PLAS-TEC)
- Ceramics (CIAC)
- High Temperature Materials (HTMIAC)
- Metals (MIAC)
- Metal-Matrix Composites (MMCIAC)

TATs & Products

A Practical Guide to Statistical Analysis of Material Property Data

This report has been specially prepared with the materials professional in mind. It bridges the gap between the science of theoretical statistics and the hands-on world of the practicing technician. The first of its kind, this report presents important statistical analysis methods from the standpoint of material property data, demonstrating the importance and relevance of statistics in the day-to-day activities of materials engineers and designers.

Life Prediction and Performance Assurance of Structural Materials in Corrosive Environments

Life prediction of structural components is vitally important to safe and cost effective operation of any system in which the materials are susceptible to environmental degradation. Performance assurance which is closely related to life prediction, is equally important to ensure that the system will operate as per design for the duration of its life. This report presents a panoramic view of this field by highlighting the variety of current approaches, identifying the limitations, and discussing directions for future efforts.

Corrosion Predictive Modeling for Aging Aircraft—Critical Review & Technology Assessment

Budgetary constraints prevent acquiring new aircraft while encouraging life extension of existing aircraft far beyond the design lives. This critical review and technology assessment highlights the significant and innovative aspects of the U.S. Air Force program to develop a predictive model for corrosion prevention and maintenance in complex structures such as joints. This program is a major step forward in the rather complex task of modeling corrosion and predicting the life of corrodible structures with any engineering relevance. The principles that have been described in this report to generate predictive capability are generic and applicable to a variety of components and structures.

Optical Limiting: An Overview

This report is intended to provide a background adequate for the novice to quickly understand the physical phenomena responsible for optical limiting behavior and the measurements routinely made to characterize the performance of nonlinear materials. In addition, some background is provided on work being pursued to molecularly engineer these materials to enhance their performance and adaptability to real world applications

Group IV Metal Carbides: Processing & Engineering Properties

This document is a critical review and technology assessment (CR/TA) of recent research, development, and evaluation of the Group IV metal carbides, TiC, ZrC, and HfC. It includes a discussion of developments in manufacturing techniques, including self-propagating high temperature synthesis. Presented are engineering properties, including thermophysical properties and oxidation characteristics.

Databook on Mechanical & Thermophysical Properties of Fiber Reinforced Ceramic Matrix Composites

This databook is organized into sections which comprehensively cover the mechanical, thermal, and physical properties of fiber-reinforced ceramic matrix composites. Data and information on ceramic matrices, as well as reinforcing ceramic fibers, are presented in this databook as look-up tables and figures.

Oxidation & Corrosion of Intermetallic Alloys

This report provides researchers and development engineers with essential information on intermetallic alloys for high temperatures. It enables users to make judicious choices for their needs including initial properties but, more importantly, by enabling them to estimate the performance in long-time use at elevated temperatures and under adverse environmental conditions.

For a listing of products, prices, availability, and distribution limitations, contact AMPTIAC and ask for an AMPTIAC Starter Kit or visit our Web site at <http://amptiac.iitri.org>

In the near future, AMPTIAC's URL will change to
<http://iac.dtic.mil/amptiac>

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