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BSI Standards Publication

Space engineering — Structural materials handbook

Part 1: Overview and material properties and applications

bsi.

National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/68, Space systems and operations.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Space engineering - Structural materials handbook - Part 1: Overview and material properties and applications

Ingénierie spatiale - Manuel des matériaux structuraux - Partie 1: Vue d'ensemble, propriétés des matériaux et applications

Raumfahrttechnik - Handbuch der Konstruktionswerkstoffe - Teil 1: Übersicht und Materialeigenschaften und Anwendungen

This Technical Report was approved by CEN on 22 November 2021. It has been drawn up by the Technical Committee CEN/CLC/JTC 5.

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European Foreword

This document (CEN/TR 17603-32-01:2022) has been prepared by Technical Committee CEN/CLC/JTC 5 “Space”, the secretariat of which is held by DIN.

It is highlighted that this technical report does not contain any requirement but only collection of data or descriptions and guidelines about how to organize and perform the work in support of EN 16603-32.

This Technical report (CEN/TR 17603-32-01:2022) originates from ECSS-E-HB-32-20 Part 1A.

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This document has been developed to cover specifically space systems and has therefore precedence over any TR covering the same scope but with a wider domain of applicability (e.g.: aerospace).

Introduction

The Structural materials handbook is published in 8 Parts.

A glossary of terms, definitions and abbreviated terms for these handbooks is contained in Part 8.

The parts are as follows:

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1 Overview

1.1 Scope

1.1.1 General

The structural materials handbook, SMH, combines materials and design information on established polymer matrix composites with provisional information on the emerging groups of newer advanced materials and their composites. Design aspects are described, along with factors associated with joining and manufacturing. Where possible, these are illustrated by examples or case studies.

1.1.2 Polymer composites

The polymer composite materials described are those having continuous fibre reinforcement in a polymer matrix, i.e.:

- Continuous fibre reinforcement, [See: [2-3]
  - Carbon
  - Aramid
  - Glass
- Thermosetting polymer matrix, [See:[2-4]]:
  - Epoxy, [See:2.4,3.2].
  - Polyimide, [See:6.12].
  - Bismaleimide, [See:6.6].
- Thermoplastic polymer matrix, e.g. PEEK, PEI, PES, [See: 6.17].

1.1.3 Advanced materials

Information on the characteristics and applications is given for:

- Magnesium alloys and their composites, [See: Clause 44].
- Aluminium alloys and their composites, [See: Clause 46].
- Titanium alloys and their composites, [See: Clause 47].
- Superalloys and their composites, [See: Clause 48].
- Intermetallic materials, [See: Clause 49].