Overview

To improve time-to-market in today’s competitive environment, engineers need an easy-to-use method of comparing, evaluating, and analyzing the large number of materials alternatives commercially available.

The MaterialCenter Databanks are collections of technical materials information in electronic format. The databanks are developed and maintained through MSC’s partnerships with premier sources of materials information. They provide a comprehensive source of property data for use by engineers for design and analysis.

The databanks listed below are available for use in MaterialCenter.

Capabilities

- Interface with MaterialCenter to optimize searching, material down-selection, and data export.
- Convert units that adhere to ASTM E-380 standards.
- Export data to third-party client applications.
- Validate your company’s materials with the latest test data and reference sources from industry.
- Provide designers and engineers with material information in a quick and traceable manner.

Benefits

- Easily access high-quality, reliable material data from around the world to improve team efficiency and information workflow.
- Improve quality and consistency with engineering data derived from a single source.
- Reduce transcription errors with electronic data transfer.
- Increase the accuracy of predictive analysis, product design, and simulation using certified material data records for CAD, CAE, or PLM software.
MaterialCenter Databanks

Standards Databanks - Materials properties developed under industry standards and certified by government agencies.

Composites

CMH-17 (MIL-HDBK-17), Material Sciences Corporation

The CMH-17 (MIL-HDBK-17) Databank is Aviation Administration. The MIL-HDBK-17 of structural composite lamina and laminate Composites CMH-17 (MIL-HDBK-17), Material government agencies. - Standards Databanks

- MaterialCenter Databanks

- Sciences Corporation

- MILHDBK-17 was produced by industry standards and certified by properties developed under sponsorship of the Department of Defense and the Federal Aviation Administration. The MIL-HDBK-17 Databank offers:
  - Over 1000 mechanical property curves
  - Metal-matrix composites of the following constituents:
    - Carbon/Bismaleimide
    - Carbon/Cyanate Ester
    - Carbon/Epoxy
    - Carbon/Polyetheretherketone
    - Carbon/Polymide
    - E-Glass/Epoxy
    - Quartz/Bismaleimide
    - S-Glass/Epoxy
  - Polymer-matrix composites of the following constituents:
    - Carbon/Bismaleimide
    - Carbon/Cyanate Ester
    - Carbon/Epoxy
    - Carbon/Polyetheretherketone
    - Carbon/Polymide
    - E-Glass/Epoxy
    - Quartz/Bismaleimide
    - S-Glass/Epoxy
  - Metal-matrix composites of the following constituents:
    - Alumina/SP AL
    - Silicon Carbide/Titanium
    - Titanium
  - Ceramic-matrix composites of the following constituents:
    - Carbon / Carbon / CVI SiC
    - Oxide / Oxide
    - SiC / BN / Mi SiC
    - SiC / BN / Si3N4
    - SiC fiber / BN-SiC / Mi SiC
    - SiC fiber / Carbon / SiC
  - Over 1000 mechanical property curves for laminate systems:
    - Astroquartz/Polyimide
    - Boron/Epoxy
    - Fiberglass/Epoxy
    - Fiberglass/Modified DAP Polyester
    - Fiberglass/Phenolic
    - Fiberglass/Polyester
    - Fiberglass/Silicone

- Ceramic-matrix composites of the following constituents:
  - Carbon / Carbon / CVI SiC
  - Oxide / Oxide
  - SiC / BN / Mi SiC
  - SiC / BN / Si3N4
  - SiC fiber / BN-SiC / Mi SiC
  - SiC fiber / Carbon / SiC
  - Over 1000 mechanical property curves for laminate systems:
    - Astroquartz/Polyimide
    - Boron/Epoxy
    - Fiberglass/Epoxy
    - Fiberglass/Modified DAP Polyester
    - Fiberglass/Phenolic
    - Fiberglass/Polyester
    - Fiberglass/Silicone

NCAMP Databank, National Institute for Aviation Research – Wichita State University

The NCAMP Databank offers detailed design property values for composite material systems that are qualified by the National Center for Advanced Materials Performance (NCAMP). Material systems included are:
  - Cytec S520-1
    - T650 Unitape
    - T650 3k-PW
  - Cytec (formerly ACG) MTM45-1
    - Style 6781 S2 Glass
    - 3K PW G30-500 Fabric
    - 12K HTS5631 Unidirectional (HTS40)
  - Hexcel 8552
    - AS4 Unitape
    - AS4 PW
    - IM7 Unitape
  - Newport NCT4708
    - 47108 Unitape
  - TenCate TC250
    - 12k HTS40

PMC90 Polymer-Matrix Composites Databank, University of Dayton Research Institute


The materials constitute a compilation of test data from a major test program performed by the University of Dayton Research Institute and approved by the Air Force Materials Laboratory and the Air Force Wright Aeronautical Laboratories. This Databank contains mechanical and thermal constants as well as temperature and strain-dependent data for the following material systems:

- Graphite/Epoxy
  - G-160/6535-1
  - HyE/1076J
  - SP313
  - T300/AFR-800
- Graphite/Polyimide
  - AS/4397
  - T300/F178
  - T300/V378A
- Graphite/Polyetheretherketone
  - AS/3004

- HMG/Epoxy
  - HyE/2034D
- SiC/Epoxy
  - SiC/5506

Metals

MMPDS-12 Databank, Battelle Memorial Institute

The MMPDS Databank contains the highest quality, comprehensive, electronic property data on metal alloy systems available. Battelle Memorial Institute maintains this databank, validates data entry, and renders new test data. MMPDS contains Design Mechanical and Physical Property tables from the source document, most of the supporting data tables, and almost all the figures that represent the results of numerous different property tests.

These include raw or reduced curve data for tests such as tensile and compressive stress-strain (Ramberg-Osgood), fatigue, percent room temperature value versus temperature for various properties, like coefficient of thermal expansion and conductivity and specific heat versus temperature, and others. The latest MMPDS-12 Databank update includes:

- Over 5,000 records of aerospace/military grade metal alloys derived from chapters in the MMPDS Handbook:
  - Chapter 1 – General Information
  - Chapter 2 – Steel
  - Chapter 3 – Aluminum
  - Chapter 4 – Magnesium Alloys
  - Chapter 5 – Titanium
  - Chapter 6 – Heat-Resistance Alloys
  - Chapter 7 – Miscellaneous Alloys and Hybrid Materials
- Over 130,000 property values based on the following tests and data types:
  - Bending Modulus Data
  - Biaxiality Data
  - Column Compression Data
  - Creep and Stress Rupture Data
  - Design Allowable Data
  - Effect of Exposure Data
  - Fatigue Data
  - FCP Data
  - Fracture Data
  - Size-Condition Data
  - Specification-Alloy-Form Data
  - Stress-Strain Curve Data
  - Stress Corrosion Data
  - Torsional Modulus Data
  - Weldability Data
Previous versions of the MMPDS Databank (MMPDS-08, -10, -11) are available upon request.

**Design Databanks – Materials used for engineering design and analysis**

**MPDB Temperature-Dependent Databank, Jahm Software, Inc.**
- 5,400 materials and over 74,000 properties for the following material types:
  - Carbides, Nitrides, Silicides, Beryllide
  - Carbon, Thermal Insulation, & Others
  - Cast Irons
  - Cermets
  - Chemical Elements & Salts
  - Composites
  - Elastomers
  - Iron & Steels
  - Magnetic alloys
  - Mold Materials
  - Nonferrous Metals
  - Organics & Hydrocarbons
  - Oxides & Glasses
  - PolymerComposites
  - Resistance alloys
  - Semiconductors
  - Solders, Intermetallics & Misc. Metal
  - Solders, Intermetallics, TBC & Misc. Met
  - Solid oxide fuel cell materials

**ASM Handbooks Databank, ASM International**
The ASM Handbooks Databank is derived from ASM International’s paper-back handbook series of the same name. Compiled from numerous handbooks from the ASM Handbook Series, the Databank contains information on the properties and processing of major material types: metals, plastics, composites, and ceramics. ASM Handbooks contains:
- Over 20,000 material records with compositional, mechanical, fatigue, hardness, and additional types of properties.
- Metals – Over 30 types available (aluminum alloys, copper alloys, carbon steels, etc.) along with over 1400 different heat treatments and test conditions.
  - Ferrous Metals
  - Nonferrous Metals

**Reference Databanks – Enables engineers to screen materials for design and production.**

- Thermocouple alloys
- Thermoplastics
- Thermoset Plastics
- Wood Products

Over 26,000 curves, including specific heat vs. temperature, density vs. temperature, strength vs. temperature, and stress-strain curves.

- Composites - Mechanical, physical, electrical, and thermal properties are reported across a wide range of test temperatures.
  - Ceramic-matrix Composites
  - Metal-matrix Composites
  - Polymer-matrix Composites
  - Miscellaneous Composites
  - Reinforcements

- Polymers – Mechanical, processing, and physical properties are reported across a wide range of test temperatures.
  - Thermoplastics
  - Thermosets
  - Rubbers

- Ceramics and Glasses - Corrosive-resistance properties subjected to various exposure media.
  - Tantalum Carbide-based materials
  - Tungsten Carbide-based materials

- Worldwide material specifications from over 20 countries, including countries such as USA, UK, France, Germany, Japan, and India.