Now available on-line—CINDAS Thermophysical Properties of Matter Database (TPMD)

The Thermophysical Properties of Matter Database (TPMD) is a web-based version of the Thermophysical Properties of Matter, the TPRC data series, from CINDAS LLC. It is a searchable on-line database that contains multiple thermophysical and thermoradiative properties for metallic alloys and elements, nonmetallic liquids and solids, composites, ceramics, gases and coatings. In addition to the searchable data, the TPMD includes theories and measurements PDF documents with hundreds of pages of supplemental text for additional research.

Similar to other CINDAS databases, the Thermophysical Properties of Matter Database has an easy-to-navigate interface.

The TPMD database contains 53,623 data curves with 155 properties for 5,269 materials categorized into 96 general material groups that are updated regularly.

Interface Tools

Save – data for further analysis.

Copy – graphs with ease into PowerPoint.

Project and Manipulate – the database content live.

Interface Features

Find – material group or property group by browsing, or material name or property name by searching.

View – the effects on a given property with changes in temperature or other independent variable.

Compare – multiple data curves of different materials on a single graph.

References – are available for every graph and description in the show text feature.

Theories & Measurements - provide information on property definition and tests.

Search and Browse the Thermophysical Properties of Matter Database by

Material Group
(Composites, Ceramics, Coatings, Organic Compounds, etc.)
Material Name
(Borosilicate Glass, Glass Fiber/Silicone Resin, Graphite, etc.)
Property Group
(Thermophysical, Thermoradiative, Optical, etc.)
Property Name
(Normal Total Emittance, Thermal Conductivity, Viscosity, etc.)

The TPMD allows the user to search using the full or partial name of the property or material. The user can also browse the TPMD using the drop-down menu browse feature.

The Convergence Center, 101 Foundry Drive Suite 4700, West Lafayette IN 47906-3445 USA
Phone: 765-807-5400 • 765-807-7011 • Fax: 765-807-5291 • info@cindasdata.com • www.cindasdata.com

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Searching and Browsing:
Thermophysical Properties of Matter Database (TPMD)
Finding Information

Search: Enter the full or partial name of the property or material.

Browse: Use the drop-down menu to find the property or material.

The Thermophysical Properties of Matter Database contains 5,269 materials in 96 material groups and 155 properties in 4 property groups.

Customizing Information

Select: The independent variable.

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Viewing Information

The TPMD allows the user to view a property of multiple materials on one graph.

Step 1: Select Materials.

Step 2: Select Data Curves or Test Conditions.

Step 3: If needed, you can also modify the Graph Parameters of the properties.

Note: At any time, the user can click on the "Show Text" button to see the values of the data points, text description, references, etc.
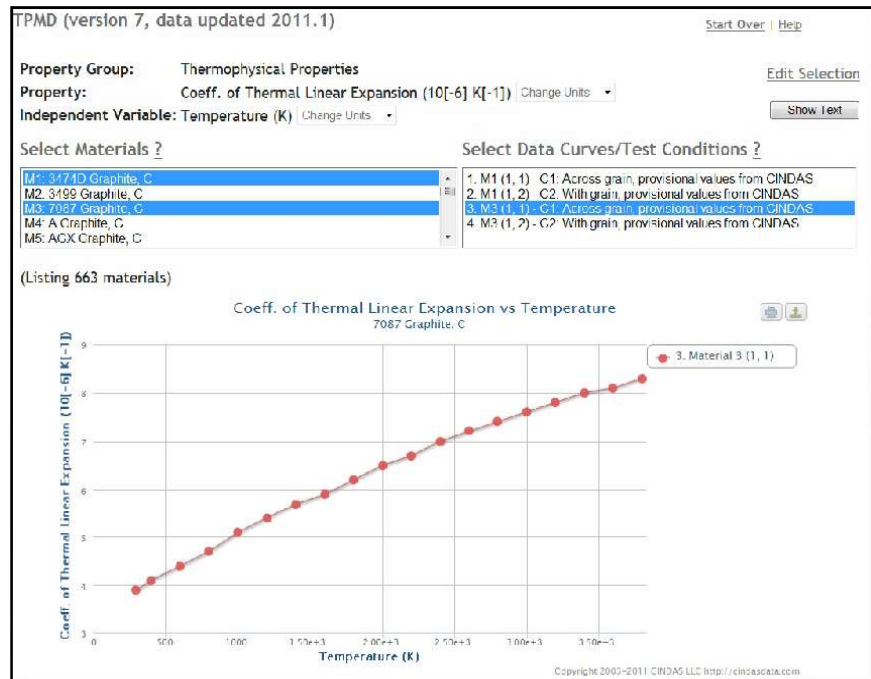
Results: Graphic and Numeric

- 53,623 data curves

- Color-coded data curves

- Multiple curves of different materials per graph

- Hovering cursor to show X and Y values of each data point

- Modifiable Y-axis and X-axis range of the graph
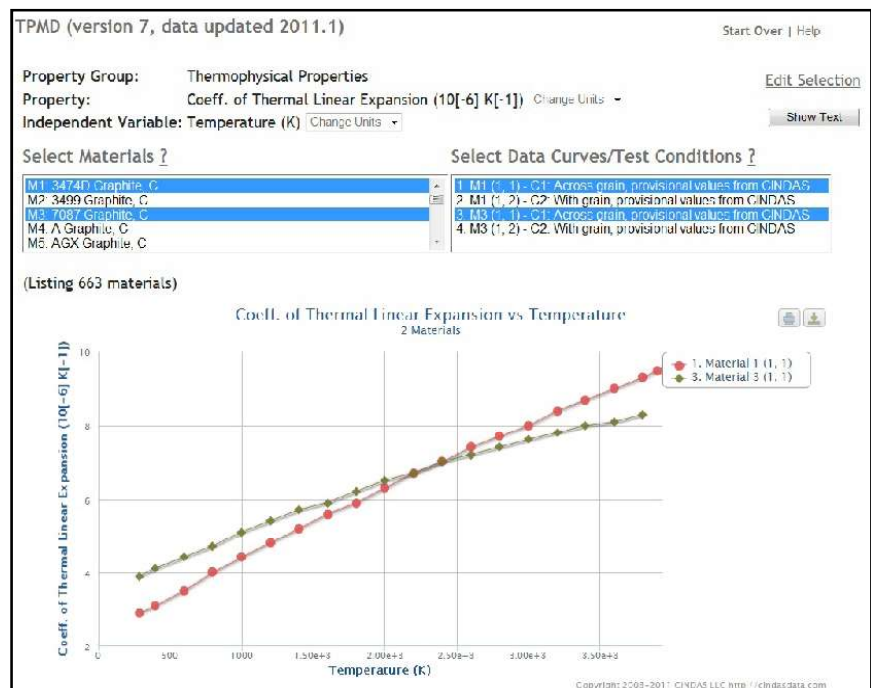
Material Groups

The 5,269 materials in the TPMD are conveniently subdivided into 96 material groups with drop down selection options for the specific materials in each Material Group. Alternatively, you can reach a specific material by entering a keyword in the Material Name box.

Material	Number
Aggregate Mixes	30
Alloys: Alloy Steels	129
Alloys: Aluminum Alloys	127
Alloys: Carbon Steels and Cast Iron	74
Alloys: Chromium Alloys	17
Alloys: Cobalt Alloys	28
Alloys: Copper Alloys	82
Alloys: Magnesium, Manganese, Molybdenum and Niobium Alloys	89
Alloys: Miscellaneous Alloys And Mixtures	15
Alloys: Nickel Alloys	91
Alloys: Other Nonferrous Binary Alloys	155
Alloys: Other Nonferrous Multiple Alloys	76
Alloys: Stainless Steels	74
Alloys: Titanium Alloys	59
Alloys: Titanium Alloys, Additive Manufacturing	1
Alloys: Zirconium Alloys	22
Animal and Vegetable Natural Substances	35
Borides	56
Bromides	20
Carbides	55
Carbonates	22
Ceramics	3
Cermets	65
Chlorides	66
Coatings: Anodized Conversion	31
Coatings: Metallic Contact	125
Coatings: Metallic Pigmented	15
Coatings: Nonmetallic Inorganic Carbide Contact	19
Coatings: Nonmetallic Inorganic Other Contact	36
Coatings: Nonmetallic Inorganic Oxide Contact	82
Coatings: Nonmetallic Inorganic Silicate or Titanate Contact	22
Coatings: Nonmetallic Pigmented, Other Binders	101
Coatings: Nonmetallic Pigmented, Others	17
Coatings: Nonmetallic Pigmented, Potassium Silicate Binder	44
Coatings: Nonmetallic Pigmented, Silicone Binder	66
Coatings: Other Contact	51
Coatings: Other Pigmented	33
Coatings: Oxidized and Others Conversion	48
Coatings: Pigmented, Trade Name	81
Coatings: Resin Contact	47
Coatings: Thermal Barrier	17
Composites: Ceramic Matrix, Particulate-Reinforced	42
Composites: Ceramic Matrix, Wisker-Reinforced	29
Composites: Kevlar Fiber	18
Composites: Laminates (Glass Fiber)	46
Composites: Laminates (Others)	19
Composites: Metal Matrix	9
Composites: Nano Fibers, Additive Manufacturing	1

Material	Number
Composites: Nano(Graphene, CNT etc) Particles or Fillers	20
Composites: Others	66
Composites: Polymer (Epoxy, Resin) Matrix	45
Compounds: Calcium, Magnesium, Sodium Oxides	92
Compounds: Inorganic Nonoxide Compounds	37
Compounds: Organic Compounds	275
Compounds: Other Oxide Compounds	144
Elements: Carbon, Graphite	145
Elements: Others	150
Fabrics, Yarns, And Hairs	7
Foods & Biological Materials	27
Gas Mixture: Monatomic and Polyatomic Systems	71
Gas Mixture: Monatomic Systems	24
Gas Mixture: Polyatomic Systems	112
Glasses	104
Hydrides	18
Interface of Different Materials	4
Intermetallic Compounds, Mixtures	32
Intermetallics: Aluminides	6
Intermetallics: Beryllides	22
Intermetallics: Miscellaneous	147
Intermetallics: Silicides	28
Iodides	18
Liquids: Fluorocarbons and Hydrocarbons	16
Liquids: Mineral and Silicone Oils	47
Liquids: Others	53
Metamaterials	1
Minerals, Rocks and Processed Mineral Substances	105
Miscellaneous Refractory Materials	82
Mixtures: Binary Mixtures of Oxides	56
Mixtures: Fluorides and Their Mixtures	81
Mixtures: Mixtures of Oxide and Nonoxide	17
Mixtures: Multiple Mixtures of Oxides	38
Mixtures: Nonoxide Inorganic Mixtures	41
Mixtures: Sulfides and their Mixtures	64
Nitrates, Nitrides and Nitrites	42
Phosphates	18
Polymers: Epoxy, Resins, Rubber, Silicones	69
Polymers: Others	134
Residues, Slags and Scales	9
Salts	20
Selenides and Tellurides	78
Semiconductors & Optical/Sensor Materials	24
Silicides	51
Single Oxides: Aluminum, Beryllium and Silicon Oxide	60
Single Oxides: Others	137
Sulfates	33
Systems & Structures	9

Property Groups

The TPMD contains 155 different properties. These properties are separated into 4 easy-to-navigate property groups. Alternatively, you can search the property names by using keywords which would bring you directly to the property you are seeking.

Thermophysical Properties – *55 Properties*

Thermoradiative Properties – *38 Properties*

Optical Properties – *20 Properties*

Other Properties – *42 Properties*

Access

Costs of subscriptions to the CINDAS databases depend on the number of locations and the number of potential users at each location. Once subscribed, engineers, librarians, researchers, and scientists all have unlimited access to the databases by IP address/ranges.

Complete Packages

The most complete package for research and applications includes:

ASMD – Aerospace Structural Metals Database

HPAD – High Performance Alloys Database

AHAD – Aerospace and High Performance Alloys Database (combines ASMD and HPAD)

CLTD – Cryogenic and Low Temperatures Database

TPMD – Thermophysical Properties of Matter Database

MPMD – Microelectronics Packaging Materials Database

The CINDAS databases give the composition and describe the test conditions of each material. They also present specific conditions for each desired material plotted on a graph.

Learn more at https://cindasdata.com/resources

We Are Confident in Our Products

The TPMD is quick, efficient, and frequently updated, and is currently used by a growing list of universities, corporations and research facilities. Please visit www.cindasdata.com for a demo.

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