



## Now available on-line—CINDAS Microelectronics Packaging Materials Database (MPMD)

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The Microelectronics Packaging Materials Database (MPMD) is a searchable, browsable on-line database that contains data about thermal, mechanical, electrical and physical properties of microelectronics packaging materials. The MPMD database contains over 943 materials, 336 properties and contains approximately 20,600 data curves.

The MPMD was developed under the sponsorship of the Semiconductor Research Corporation (SRC). The results of this research program were originally available only to SRC members. Now they are available to engineers and scientists worldwide.

## Search and Browse the Microelectronics Packaging Materials Da- tabase by

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### Material Group

(Adhesives, Ceramics, Unfilled Epoxies, Semiconductors, etc.)

### Material Name

(Silver-Filled Epoxy, Iron Aluminides Intermetallics, Germanium, etc.)

### Property Group

(Electrical, Mechanical, Thermophysical, Optical, etc.)

### Property Name

(Dielectric Constant, Leakage Conductance, Elastic Modulus, etc.)

## Access

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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.

## Interface Tools

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**Save** – data for further analysis.

**Copy** – graphs with ease into PowerPoint.

**Project and Manipulate** – the database content live.

## Interface Features

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**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.

## Complete Packages

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The most complete package for research and applications includes all three complementing databases:

ASMD – Aerospace Structural Metals 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.

## Searching and Browsing: Microelectronics Packaging Materials Database (MPMD) 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 Microelectronics Packaging Materials Database contains 943 materials in 22 material groups and 336 properties in 13 property groups.*

MPMD (version 8, data updated 2010.4) [Start Over](#) | [Help](#)

**Browse By:**  
Material Group  
[Dropdown menu]  
or  
Property Group  
[Dropdown menu]

**Search By:**  
Material Name  
[Text input]   
e.g., ni inco, nickel incoy  
or  
Property Name  
[Text input]   
e.g., elastic, electric resistivity

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Select Property Group: Mechanical Properties - Stress

(13 property groups)

Select Property Name: [Dropdown menu]

- Biaxial Stress
- Biaxial Stress, Yield
- Compressive Lower Yield Stress
- Compressive Stress
- Compressive Stress in Pa
- Compressive Stress, True
- Critical Resolved Shear Stress
- Creep Stress
- Elastic Hexaxial Limit
- Film Stress
- Flexural Stress
- Flow Stress
- In Plane Shear Stress
- Residual Stress
- Rupture Stress, Normalized to F(T,U)
- Shear Stress
- Shear Stress in Pa
- Shear Stress, Resolved
- Stress Relaxation
- Tensile Flow Stress
- Tensile Stress
- Tensile Stress in Pa
- Tensile Stress, True
- Tensile Stress, True in Pa
- Tensile Upper Yield Stress
- Thermal Stress
- Transverse Rupture Stress

## Customizing Information

**Select:** The independent variable.

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Select Property Group: Mechanical Properties - Stress  
(13 property groups)

Select Property Name: Biaxial Stress  
(27 properties)

Property Range  
Biaxial Stress (MPa) -156.37 - 5488.0

Select an Independent Variable, and then click the Show Graph or Show Text button.

Independent Variable	Minimum	Maximum
<input checked="" type="radio"/> Annealing Temperature (K)	230.4	1538.0
<input checked="" type="radio"/> Film Thickness (micron)	0.04	0.45
<input checked="" type="radio"/> Temperature (K)	238.16	769.6

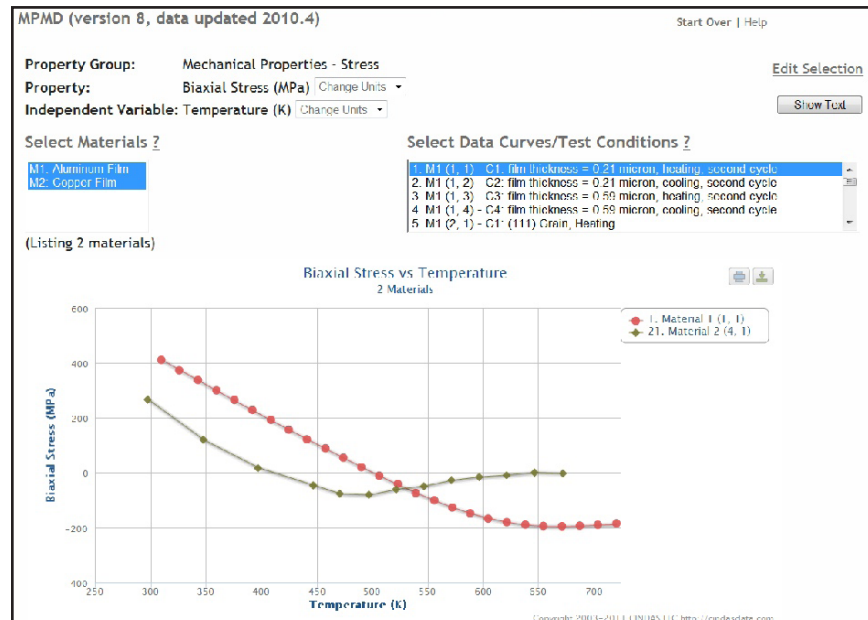
## Viewing Information

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

Step 1: Select Materials.

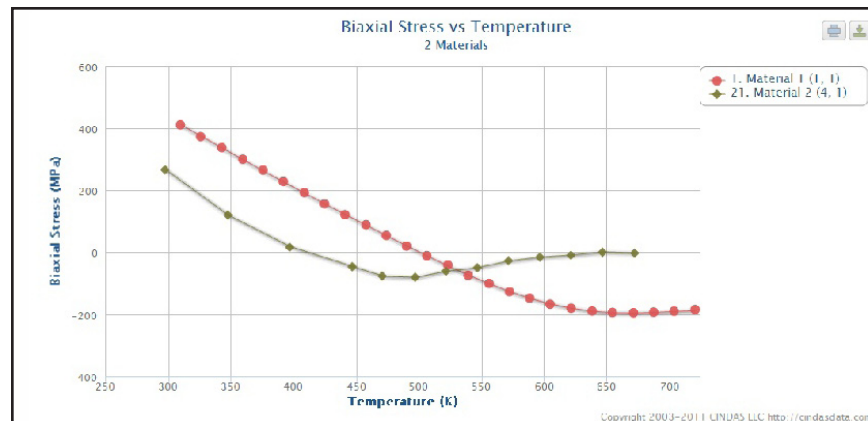
Step 2: Select Data Curves or Test Conditions.

*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

- Approximately 20,600 data curves
- Color-coded data curves
- Multiple curves of different materials per graph
- Hovering cursor to show X and Y values at each data point
- Unit conversion package
  - Contains both English and SI units
  - Shows all typically used units for the variables
  - Allows both X-axis and Y-axis selection



## Material Groups

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The MPMD has over 943 materials classified into 22 material groups. The MPMD can be searched by material or property name. If the full name is used to search, the search will bring the user directly to that material. If a partial name is used, the search will return the closest matches.

Adhesives – 30 *Materials*  
Ceramics – High K Oxides – 16 *Materials*  
Ceramics – Nitrides, Silicides, etc. – 24 *Materials*  
Ceramic Oxides – 54 *Materials*  
Coating and Unfilled Epoxies – 25 *Materials*  
Composites – Laminates (Glass/Epoxy) – 74 *Materials*  
Composites – Laminates – 63 *Materials*  
Composites – Thermal Management – 40 *Materials*  
Elements – 34 *Materials*  
Encapsulants and Underfill Materials – 26 *Materials*  
Intermetallics, Aluminides – 66 *Materials*  
Intermetallics, Beryllides – 35 *Materials*  
Intermetallics, Miscellaneous – 50 *Materials*  
Intermetallics, Silicides – 30 *Materials*  
Liquids and Gases – 5 *Materials*  
Metal Alloys – 50 *Materials*  
Molding Compounds – 55 *Materials*  
Polymers – Others – 20 *Materials*  
Polymers – Polyimides – 57 *Materials*  
Semiconductors – 29 *Materials*  
Solders – Lead – 42 *Materials*  
Solders – Lead Free – 59 *Materials*

## Property Groups

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The MPMD contains over 300 different properties. These properties are separated into 11 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 – 37 *Properties*  
Electrical Properties – 20 *Properties*  
Mechanical Properties:  
Modulus – 43 *Properties*  
Strength – 39 *Properties*  
Stress – 27 *Properties*  
Hardness – 8 *Properties*  
Fatigue – 12 *Properties*  
Creep – 16 *Properties*  
Others – 58 *Properties*  
Optical Properties – 8 *Properties*  
Other Properties – 51 *Properties*

## We Are Confident in Our Products

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The MPMD 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](http://www.cindasdata.com) for a demo.