

## About Us

CINDAS LLC is a private company formed exclusively to disseminate materials properties data collected and analyzed by the Center for Information and Numerical Data Analysis and Synthesis (CINDAS) at Purdue University. CINDAS LLC obtained an exclusive license from the Purdue Research Foundation to disseminate the data. Staff members include chemical, mechanical, materials, and industrial engineers, chemists, and computer scientists. The President of CINDAS LLC has been closely associated with CINDAS for more than 30 years.

In 2007, CINDAS LLC entered into a Cooperative Research and Development Agreement (CRADA) with the United States Air Force, Air Force Research Laboratory, Materials and Manufacturing Directorate (AFRL/MLSC), Wright Patterson Air Force Base. Through this agreement, CINDAS LLC developed the Aerospace Structural Metals Database (ASMD) and assumed responsibility for the technical maintenance and distribution of the ASMD, Structural Alloys Handbook (SAH), and Damage Tolerant Design Handbook (DTDH).

CINDAS LLC has become the industry benchmark for critically evaluated materials properties data since its inception in 2003. CINDAS LLC is committed to carrying on the tradition of providing reliable materials properties data, while continually improving and expanding upon its material base, and providing that data in an easily accessible and searchable electronic format.

To learn more about the history of CINDAS LLC and the materials properties tradition, go to:  
<https://cindasdata.com/about/history>

## Databases

### Aerospace Structural Metals Database (ASMD)

The ASMD was created by CINDAS LLC in 2007. It is the web-based version of the highly respected and widely used Aerospace Structural Metals Handbook (ASMH) developed by Air Force and NASA. The ASMD has quickly become the industry benchmark for materials properties of high strength, lightweight alloys. It now contains more than 93,600 data curves and over 17,300 pages of critically evaluated information on 254 alloys used in the aerospace and other industries. It has the same interactive features as the TPMD and MPMD. It is updated and expanded continually with carefully selected alloys.

### High Performance Alloys Database (HPAD)

The HPAD was created by CINDAS LLC to address the needs of the oil/gas, chemical processing, power generation, and transportation industries. We were asked by many engineers in industries other than aerospace to produce a database of materials properties data analogous to the ASMD in format, but more focused on the specific needs of these high-performance industries including detailed data on corrosion performance and joining. Some time ago, we conducted an exhaustive study with materials experts in these industries as well as with the major manufacturers of high performance alloys. It now contains a total of 109 chapters with nearly 150 alloys. There are over 14,000 datasets, nearly 49,000 data curves with more than 10,400 PDF pages of text, tables and references. The HPAD has the same interactive features as the ASMD, TPMD and MPMD. Like our other databases, it is web-based, and updated and expanded continually with carefully selected alloys.

### **Aerospace and High Performance Alloys Database (AHAD)**

The AHAD was created by CINDAS LLC to address the needs of our clients in all industries including the aerospace, defense, oil/gas, chemical processing, power generation and transportation industries. When we were asked by many engineers in industries other than aerospace to produce a materials properties database analogous to the ASMD, in format, but more focused on the specific needs of these high performance industries including detailed data on corrosion testing and joining, we created the High Performance Alloys Database (HPAD). We recognized that many of our current ASMD clients would also want the materials properties data on the alloys in the HPAD. Therefore we have merged the HPAD and ASMD into a powerful combined database with alloys of importance in all industries requiring high performance alloy data, the AHAD. The AHAD contains materials properties data on 298 alloys, with nearly 100,000 data curves and over 19,300 pages. It has the same interactive features as the ASMD, HPAD, TPMD and MPMD. Like our other databases, it is web-based and updated and expanded continually with carefully selected alloys. We are currently taking orders. Please contact us if you would like to transition your current subscription from the ASMD to the AHAD.

### **Cryogenic and Low Temperatures Database (CLTD)**

The CLTD, released in May 2021, was developed based on suggestions and input from our current customers. It offers material characteristics in the cryogenic and low temperature ranges. It consists of thermophysical, mechanical, electrical and other properties of over 2000 materials in the temperature ranges from 0 K to 273 K. Initial data is from both NIST data resources as well as CINDAS data. More data will be added as it becomes available. This is an optimal source for cryogenic and low temperature data.

### **Microelectronics Packaging Materials Database (MPMD)**

The MPMD contains data and information on thermal, mechanical, electrical and physical properties of electronics packaging materials, and it is available in a web-based format. The database is continually updated and expanded. The MPMD contains 1,080 materials, 405 properties, and contains over 23,400 data curves.

### **Thermophysical Properties of Matter Database (TPMD)**

The TPMD contains data and information on thermophysical properties. This is the searchable, electronic version of the Thermophysical Properties of Matter, the TPRC data series. It is available in a web-based format. The database is continually updated and expanded. The TPMD contains over 5,000 materials categorized into 85 material groups, 107 properties, and over 51,700 data curves.

## **Graphing Functions**

### **CINDAS LLC web-based database graphing functions include:**

- Large graphs.
- Hovering cursor will show x and y values of each data point on the graph, in the color of the graph. All of the actual test data is still shown using the Show Text option.
- Zoom feature expands the scale of the graph instantly. To zoom into the graph, click and drag a box around the data points to see in more detail. The graph will automatically adjust the axis values. This feature may be used multiple times to expand the same area of the graph. To return to the original graph, click Reset Zoom.
- Export to printer, JPG, PNG, PDF, etc. New icons on graph display, allow user to save/export the graph to various programs.

- Change Units feature placed next to the property and can be changed prior to viewing graph.
- Expanded HELP section to explain new features.
- Question marks (?) for immediate help with material and curve selection instructions.

## Handbooks

### Damage Tolerant Design Handbook (DTDH)

The DTDH is a comprehensive compilation of fracture and crack growth data for high strength alloys. The handbook is a compilation of mechanical property data that are useful for damage tolerant design and analyses. Each alloy section contains a data summary, fracture toughness data, and crack growth resistance data. The fracture toughness, crack growth, R-curve, sustained load, and threshold data are for alloy and stainless steels, nickel based super alloys, titanium alloys, and aluminum alloys. The five-volume, 3,600 page set was compiled by the Materials Directorate of Wright Patterson Air Force Base. It is available in searchable PDF format.

### Structural Alloys Handbook (SAH)

The SAH, originated to assist designers in the metals and alloys selection process, draws on a database of well-defined test results and metals properties information. It includes representative, detailed characterization data for the more common metals and alloys important to construction, machine tool, heavy equipment, automotive, and general manufacturing industries. The SAH covers wrought steel, cast iron, wrought stainless steel, cast steel, wrought and cast aluminum, copper, brass, bronze, magnesium, and titanium. This handbook consists of three volumes, 2,500 pages. It is available in searchable PDF format.

**To learn more, please visit our website at: <https://cindasdata.com/>**