Cryogenic and Low Temperatures Database

New Product Offering from CINDAS in May 2021

Overview of the Cryogenic and Low Temperatures Database (CLTD)



CINDAS has developed a new product offering of material characteristics in the cryogenic and low temperature ranges. Most of the data will be in the temperature ranges 0 K to 273 K



It consists of thermophysical, mechanical, electrical and other properties for over 2000 materials



Initial data is from CINDAS and NIST with other relevant data being added



Optimal source for cryogenic and low temperature data

Amount of Data and Types of Properties

- 23,000+ data curves
- 48% of data curves are thermophysical properties vs temp.
- 47% of the data curves are mechanical properties vs temp.
- Breakdown of the different property types
 - 11,000 data curves of thermophysical properties
 - 600 data curves of thermoradiative properties
 - 400 data curves of electrical and nuclear properties
 - 11,000 mechanical properties (strength, modulus, fatigue, strain rate, fracture toughness, etc.)
 - 100 data curves for other properties
 - In total there are 250 property types in the CLTD

Materials in the CLTD (54 material groups)

- Adhesives
- Alloys: Aluminum Alloys
- Alloys: Beryllium, Magnesium, Manganese, Molybdenum & Tantalum Alloys
- Alloys: Chromium, Cobalt, Niobium (Cb), & Zirconium Alloys
- Alloys: Copper Alloys
- Alloys: Nickel Alloys
- Alloys: Other Nonferrous Alloys
- Alloys: Solders Leaded & Lead Free
- Alloys: Steels, Carbon & Low Alloy
- Alloys: Steels, High Strength
- Alloys: Steels, Other Alloy Steels
- Alloys: Steels, Stainless Steels
- Alloys: Titanium Alloys
- Borides & Bromides
- Carbides & Carbonates
- Ceramics
- Chlorides
- Coatings

- Composites: Kevlar Fiber & Thermal Management
- Composites: Laminates (Glass Fiber)
- Composites: Laminates (Others)
- Composites: Others
- Compounds: Calcium, Magnesium, Sodium Oxides
- Compounds: Inorganic Non-oxide Compounds
- Compounds: Molding
- Compounds: Organic Compounds
- Compounds: Other Oxide Compounds
- Elements: Carbon, Graphite
- Elements: Metals
- Elements: Others
- Encapsulants, Underfill Materials & Unfilled Epoxies
- Gas Mixture: Monatomic & Polyatomic Systems
- Glasses
- Hydrides & Silicides
- Intermetallics, Aluminides, Silicides & Mixtures Compounds
- Intermetallics, Miscellaneous

- Iodides & Phosphates
- Liquids: Mineral & Silicone Oils
- Liquids: Others
- Minerals, Rocks, Processed Mineral Substances & Miscellaneous Refractory Materials
- Miscellaneous Materials
- Mixtures: Fluorides & Their Mixtures
- Mixtures: Nonoxide Inorganic Mixtures
- Mixtures: Oxides Mixtures
- Mixtures: Sulfides & Their Mixtures
- Nitrates, Nitrides & Nitrites
- Polymers: Epoxy, Resins, Rubber, Silicones
- Polymers: Others
- Salts
- Selenides & Tellurides
- Semiconductors & Optical/Sensor Materials
- Single Oxides: Aluminum, Beryllium & Silicon Oxide
- Single Oxides: Others
- Sulfates

Key Thermophysical Properties

- Thermal Expansion
- Coef. of Thermal Expansion
- Thermal Conductivity
- Specific Heat
- Emissivity



Key Mechanical Properties

- Young's Modulus
- Strength
- Stress
- Hardness
- Fatigue
- Crack and Fracture Toughness

Key Electrical and Nuclear Properties

- Dielectric Constant
- Dielectric Strength
- Electrical Resistivity
- Hall Constant
- Hole Concentration

Features and Functionality of CLTD

- Easy to navigate interface
- Plot and export data
- Compare multiple data curves of the same property for different materials on a single graph
- Search by material/property group, material name or specific material property
- References are given for every graph

Screen Shot of Thermal Expansion vs. Temperature for Different Materials

(Material 5 – 6061 Aluminum, Material 13 – Copper, Material 21 – Gold)



Key Market Applications CLTD

- Space
- Liquefaction of gases
- Medical
- Military
- Industrial and transportation
- Electronics
- Cryocoler (refrigerator designed to reach cryogenic temperatures)
- Nuclear
- Subatomic particle research

Why Your Organization Needs the CLTD

- All cryogenic and low temperature data in a single database
- Saves valuable time looking for validated data
- 2200 different materials in database
- Temperature range from 0 K to 273 K
- All data is linked to original reference
- Failure analysis tool
- Valuable tool for materials and design engineers
- Compare product characteristics for different materials

How to get the CLTD

- Send email to info@cindasdata.com
- Call us at 765.807.5400
- Use this link on our webpage: https://cindasdata.com/support/contact
- Contact your distributor if you already are a CINDAS LLC customer