



Now available on-line—CINDAS Aerospace Structural Metals Database (ASMD)

The ASMD web-based database allows the user to instantly see the properties and relationships for 227 metal alloys with over 84,000 data curves. This user-friendly interface enables ASMD subscribers to quickly select and compare the attributes of the alloys for which they are looking.

The ASMD provides numeric and graphic information as part of the database, including a comprehensive PDF consisting of additional information for each alloy.

ASMD Users

Universities	Course Material Aid
Technical Schools	Project Reference & Guide
Government Agencies	New Material Research
Aerospace Industry	Turbine Design
Automotive Industry	Developing Engines & Frame
Industrial Suppliers	Manufacturing, Machinery
Research Corporations	Research and Development

And many others...

About the Data

The ASMD was fully developed by CINDAS LLC from the widely used and highly respected Aerospace Structural Metals Handbook (ASMH).

CINDAS LLC completed and released the database under a Cooperative Research and Development Agreement (CRADA) with the United States Air Force Materials Directorate at Wright Patterson Air Force Base.

Search and Browse the Aerospace Structural Metals Database by

Material Group

(Aluminum, Titanium, Nickel Alloys, Stainless Steels, etc.)

Material Name

(Al6061, Ti-6Al-4V, AZ63A, etc.)

Property Group

(Mechanical, Thermophysical, etc.)

Property Name

(Yield Strength, Elongation, Fracture Toughness, etc.)

Property Groups

The ASMD contains over 540 different properties. These properties are separated into 20 easy-to-navigate property groups. Alternatively, you can search the property names by using keywords which would bring you directly to the property you're interested in.

Thermophysical

Thermoradiative

Electrical and Nuclear

Mechanical Properties

Strength, Stress, Hardness, Fatigue & Crack Growth, Impact Energy, Strain, Area Reduction, Deformation and others

Temperature

Time, Life to Failure

Corrosion, Oxidation, and Weight Change

Length, Thickness, Diameter, Size, and Grain Size

Content of Component, Phase

Plus others...

Searching and Browsing: Aerospace Structural Metals Database (ASMD) 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 Aerospace Structural Metals Database contains 227 metal alloys in 20 metal groups and over 542 properties in 20 property groups.

ASMD (version 2.5, data updated 2011.1) [Start Over](#) | [Material](#) | [Prop. Index](#) | [Help](#) | [Help](#)

Browse By:
Material Group
[Dropdown Menu]

Search By:
Material Name
[Text Input]
e.g., 6061-T6 Aluminum

or

Property Group
[Dropdown Menu]

or

Property Name
[Text Input]
e.g., electric Electric Resistivity

ASMD (version 2.5, data updated 2011.1) [Start Over](#) | [Material](#) | [Prop. Index](#) | [Help](#) | [Help](#)

Select Property Group: Mechanical Properties - Fatigue, Crack [Dropdown Menu]

(20 property groups)

Select Property Name: [Dropdown Menu]

- Alternating Pseudo Stress
- Cycles to First/Initiation Crack
- Delay Cycles
- Effective Crack Length
- Fatigue, Alternating Stress
- Fatigue, Crack Growth Rate
- Fatigue, Crack Growth Rate per Cycle
- Fatigue, Cyclic Stress
- Fatigue Limit/Endurance Limit
- Fatigue, Maximum Stress
- Fatigue, Mean Stress
- Fatigue Strength
- Fatigue Strength Ratio, Fatigue Strength/TS
- Fatigue Strength Ratio, Fatigue Strength/Fty
- Fatigue Stress
- Fatigue, Stress Amplitude
- Fatigue, Stress Range
- Fatigue, Torsional Strength
- Mean Stress
- Peak Pseudo Stress
- Percent of Fatigue Max. Stress/ Ultimate Strength
- True Fracture Stress

Customizing Information

Select: The independent variable.

ASMD (version 2.5, data updated 2011.1) [Start Over](#) | [Material](#) | [Prop. Index](#) | [Help](#) | [Help](#)

Select Property Group: Mechanical Properties - Fatigue, Crack [Dropdown Menu]

(20 property groups)

Select Property Name: Fatigue, Alternating Stress [Dropdown Menu]

(22 properties)

Property Range
Fatigue, Alternating Stress (ksi) -0.4 - 180.11

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

Independent Variable	Minimum	Maximum
<input type="radio"/> Cycles (cycles)	30506.47	321062.0
<input type="radio"/> Cycles to Failure (cycles)	981.4	571023513.61
<input type="radio"/> Cycles to First/Initiation Crack (cycles)	1/33.36	93351.3/
<input type="radio"/> Fatigue, Mean Stress (ksi)	-16.0	232.55
<input type="radio"/> Mean Stress (ksi)	0.0	99.28

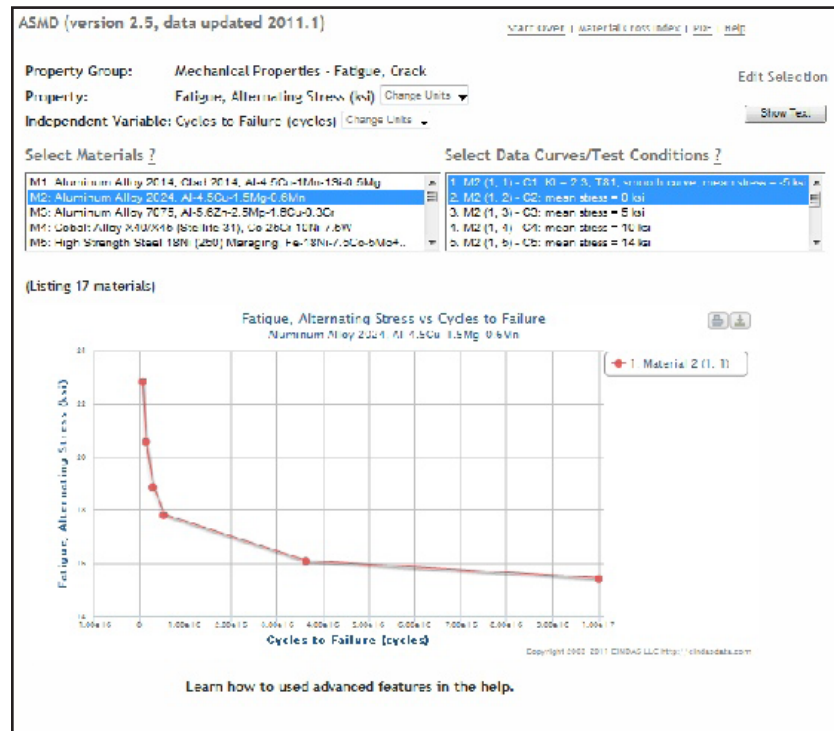
Viewing Information

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

Step 1: Select Materials.

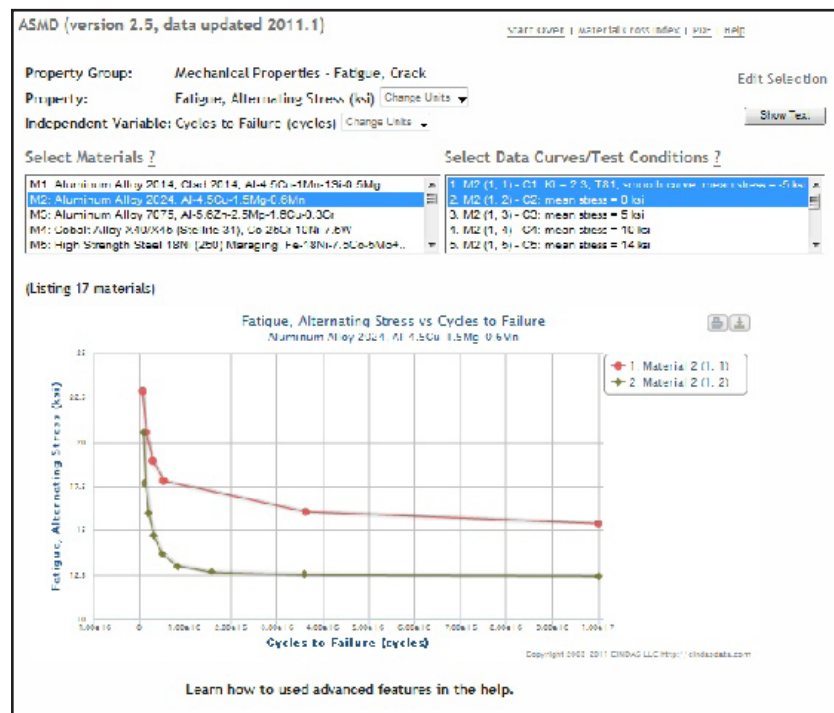
Step 2: Select Data Curves or Test Conditions.

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

- Over 84,000 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
- 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



Materials Cross Index

The materials cross index contains the commercial and alternative designations for all the metal alloys in the database. This feature can be used to find the correct metal alloy when only the trade name or commercial designation is available.

Material Name	Commercial and Alternated Designations
Carbon Steel T-1, Fe-0.15C-0.8Mn-0.85Ni-0.53Cr-0.50Mo+	T-1, T-1 Type A, T-1 Type B, USS T-1, USS T-1 Type A, USS T-1 Type B
High Strength Steel 4130, Fe-0.30C-0.95Cr-0.20Mo	4130, AISI 4130, SAE 4130, 4130H, UNS G41300, UNS H41300
High Strength Steel 4140, Fe-0.4C-1Cr-0.2Mo	4140, AISI 4140, SAE 4140, 4140H, UNS G41400, UNS J14046,
High Strength Steel 4330V, Fe-0.3C-1.8Ni-0.8Cr+	4330V, 4330, 4330 Mod, 4330V Mod, 4330V (Mod+Si), UNS J23260, UNS K23
High Strength Steel 4335V Mod, Fe-0.35C-1.8Ni+	4335 V Modified, 4335 Modified, UNS Number K33517
High Strength Steel 4340 (4337), Fe-0.4C-1.8Ni+	4340, AISI 4340, SAE 4340, E 4340, 4340 H, UNS G43400
High Strength Steel 52100, Fe-1C-1.45Cr	52100, E 52100, Teten (Alleghegy-Ludlum)
High Strength Steel 8630, Fe-0.3C-0.55Ni-0.5Cr-0.25Mo	8630, AISI 8630, SAE 8630, B630H, UNS J13042, UNS J13050, UNS GB6300
High Strength Steel E9310, Fe-0.1C-3.25Ni-1.2Cr-0.1Mo	E9310, SAE 9310, AISI E 9310 H, AMS 6260 E, UNS G93106
High Strength Steel 17-22A(S), 17-22A(V), Fe-C-1.3Cr+	17-22A(S), 17-22(V), Uniloy 14 MV (Universal Cycloas designation for 17-22A(S))
High Strength Steel D6A, D6AC, Fe-0.46C-1.0Cr-1.0Mo-0.55Ni	D6A (air melt), D6AC, UNS K2472B, UNS K24729
High Strength Steel Hy-Tuf, Fe-0.25C-1.8Ni-1.5Si-1.3Mn-0.4Mo	Hy-Tuf, UNS K32550
High Strength Steel Nitralloy 135 Mod, Fe-0.4C-1.6Cr-1.1Al+	Nitralloy 135 modified, Nitralloy Type G modified, AMS 6470 Nitriding Steel, SAE 7140, U
High Strength Steel Hy-130/140, Fe-5Ni-0.55Cr-0.47Mo-0.075V	HY 130, 5 Ni-Cr-Mo-V Steel, UNS K51255
High Strength Steel 300-M, Fe-0.43C-1.8Ni-1.6Si-0.8Cr-0.4Mo+V	300M, Tricent, 4340 M, UNS K44220, UNS K44540
High Strength Steel H-11 Mod, Fe-0.4C-5Cr-1.3Mo-0.5V	H-11 Mod, AISI Type H-11, SAE Type H-11, UNS T20811, Al Tech Potomac A, Carpenter
High Strength Steel 18Ni Maraging (250 G), Fe-18Ni-7.5Co-	

On-line Handbook

The Aerospace Structural Metals Database includes an interactive on-line version of the printed handbook. The on-line PDF handbook supplements the ASMD by providing additional information about the metal alloys.

- General Overview
- Commercial Designations
- Alternative Designations
- Metal Specifications
- Composition
- Heat Treatment
- Forms & Conditions
- Melting & Casting
- Fabrication
- Metal Treatments

And many others...

Aerospace Structural Metals Handbook		Non-Ferrous Alloys • AIWT
Author K. Brown		7475Al
1 GENERAL		Al
	Aluminum alloy 7475 is primarily an aerospace alloy used in a heat-treated condition. It is usually available as bare or clad sheet or as plate, but on occasions, extrusion and forgings have been made for special applications in place of its sister alloys, 7075 and 7175.	5.6 Zn
	Alloy 7475 is basically a high purity version of 7075, i.e., it contains lower iron and silicon, and has marginally lower upper limits on copper and magnesium. Special proprietary processing may sometimes be given to 7475. The limits on chemical composition reduce the amounts of second phase constituents, which result in higher fracture toughness at the same level of strength and corrosion resistance. In over-aged tempers, for example, T7x, 7475 is resistant to exfoliation and stress corrosion. Most aerospace applications are for component requiring high strength and toughness at temperatures up to 300 F.	2.2 Mg
1.01 Commercial Designations	7475 aluminum alloy	1.5 Cu
1.02 Alternate Designations	UNS A97475	0.21 Cr
1.03 Specifications	7475-T7351 plate: AMS 4202 [33] 7475-T651 plate: AMS 4090 [34]	Low Si
		Fe
		Mn
		Ti
1.04 Composition	[Table] Aluminum Association composition limits.	
1.05 Heat Treatment	Details of the heat treatments should be obtained, when required, from the specific supplier of the material due to possible differences in fabrication history, and consequent differences in response to heat treatments.	
1.06 Hardness		
1.061	T61 sheet: R_B 89; T761 sheet: R_B 85; T7351 plate: R_B 76 to 85.	
1.07 Forms and Conditions Available	Alloy 7475 is available as sheet (up to 0.25-inch thick) in both bare and clad forms, in either T61 or T761 tempers. It is also available in T7351, T7651, T76351 and T651 plate up to approximately 4-inches in thickness, and in extruded rods for the manufacture of cartridge cases. Producers and aerospace companies have also investigated the availability of 7475 structural forgings and extrusions; however, the data are not found in the open literature.	

We Are Confident in Our Products

The ASMD 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.