

# Aerospace Structural Metal Database(ASMD)

## 航空宇宙構造鋼データベース

Data Type: データベース  
 Subject : 冶金  
 Publisher : CINDAS LLC  
 URL: <https://cindasdata.com>

ASMDの前身はAerospace Structural Metals HandbookとしてNASAとアメリカ空軍によって作成され幅広く利用されておりました。ASMDは航空産業や部品メーカーの設計者向けに2007年からCINDAS社により提供されている他に代えが効かないWebベースの物性ファクト・データベースです。

### 特徴

- CINDAS社の主要なDBとして、2018年も材料を追加中。
- 専門家のレビューを受けた情報を提供
- 17,000PDFのテキストページ、91,800以上のデータカーブと257の合金
- アメリカの冶金の歴史的遺産と最新の材料を融合したデータベース
- 世界中で最も大きな根拠のある材料物性ファクト・データベース
- ブラウザ (Firefox, Chrome, Safariサポート) とJavaスクリプト、Cookieのみで、参照可能
- IP認証

### 収録例 :

Material Group(材料グループ): Aluminum, Titanium, Nickel Alloys, Stainless Steels, Ultra High Strength Steels etc.

Material Name(材料名): A16061, Ti-6Al-4V, AZ63A, Inconel 706, etc

Property Group(物性グループ): Mechanical, Thermophysical, etc

Property Name (物性名): Yield Strength, Elongation, Fracture Toughness, Corrosion Rate, etc

### 物性グループ :

Thermophysical(熱物性), Thermoradiative (熱放射物性), Electrical and Nuclear (電氣的及び核物性), Mechanical Properties(機械的物性) (Strength(力学), Stress(圧力), Hardness(硬度), Fatigue & Crack Growth(疲労及び亀裂増大), Impact Energy(衝突エネルギー), Strain(ひずみ), Area Reduction(断面収縮), Deformation(変形) and others), Temperature (温度), Time, Life to Failure (時間及び機能停止までの時間), Corrosion(腐食), Oxidation(酸化), and Weight Change(重量変化), Length(力), Thickness(厚み), Diameter(直径), Size(大きさ), and Grain Size(粒径) Content of Component(構成要素の中身), Phase(位相)など

### 内容のイメージ :

ASMD (version 8.2, data updated 2018.05)

Material Group: Aluminum Alloys; Wrought, Heat Treatable  
 Material Name: Aluminum Alloy 2048, Al-3.3Cu-1.5Mg-0.4Mn  
 Property: Compressive Strength, Yield (ksi)  Change Units  Logarithmic  
 Independent Variable: Temperature (F)  Change Units  Logarithmic

#### Select Materials ?

Select one or more materials from the list below. Hold the control key to select multiple materials. Available data curves will be displayed on the right. Then proceed to Step 2.

M1: Aluminum Alloy 2048, Al-3.3Cu-1.5Mg-0.4Mn

(Listing 1 materials)

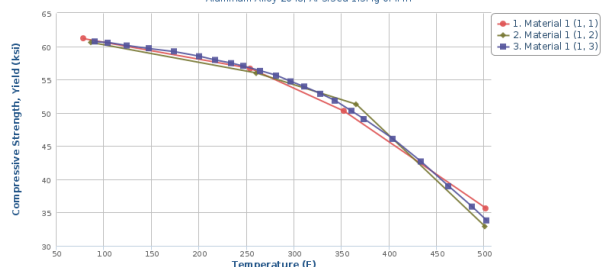
#### Select Data Curves/Test Conditions ?

Select between one and twenty data curve descriptions from the list below to view graphs. Hold the Control key to select multiple data curves.

Key: Selected Material: (Set, Curve) - Remarks

1. M1 (1, 1) - C1: 3" plate, Cond T851, L, exp data  
 2. M1 (1, 2) - C2: T, exp data  
 3. M1 (1, 3) - C3: Smooth Curve

Compressive Strength, Yield vs Temperature  
 Aluminum Alloy 2048, Al-3.3Cu-1.5Mg-0.4Mn



(Listing 1 materials)

Start

Material: Aluminum Alloy 2048, Al-3.3Cu-1.5Mg-0.4Mn  
 Property: Compressive Strength, Yield (ksi)  
 Independent Variable: Temperature (F)

Aluminum Alloy Al-2048, Al-3.3Cu-1.5Mg-0.4Mn

Compressive property (Fcy) of plate at room and elevated temperatures.

Specimen Form: 3" plate.  
 Condition: T851.  
 Orientation: L, T.

C1: L, exp data;  
 C2: T, exp data;  
 C3: smooth curve.

Data Points

X	Y
7.8629e+01	6.1209e+01
2.5431e+02	5.6646e+01

Curve: 1  
 C1: L, exp data

テキストにて数値  
 の確認及びレファ  
 レンス確認

GRADE	UNS
<b>ALUMINUM ALLOYS</b>	
<b>Cast</b>	
355/C355	A33550
A201	A02010
A356/356	A03560/A13560
A357	A13570
<b>Wrought/Heat Treatable</b>	
2014 & Clad 2014	A92014
2024	A92024
2024 Clad	A92024
2048	A92048
2090	A92090
2098	A92098
2124	A92124
2195	A92095
2219 & Clad 2219	A92219
2297	A92297
2519	A92519
2618	A92618
2624/2026	A92624/A92026
6013	A96013
6061	A96061
6069	A96069
6082	A96082
7005	A97005
7049	A97049
7050	A97050
7055	A97055
7075 & Clad 7075	A97075
7085	A97085
7150	A97150
7175	A97175
7475	A97475

GRADE	UNS
<b>STAINLESS STEELS</b>	
<b>Austenitic</b>	
19-9DL	J92843/K63198/K63199
203EZ	S20300
21-6-9	S21904
CF8C-Plus	J92604
Nitronic® 60	S20162/S21800
Type 201	S20100
Types 301 & 302	S30100/S30200
Types 303/303 Se	S30300/S30323
Types 304/304L	S30400/S30403
Type 305	S30500
Types 310/310S	S31000/S31008
Type 314	S31400
Types 316 & 317	S31600/S31603 & S31700/S31703
Type 321	S32100
Types 347 & 348	S34700/S34800
<b>Martensitic</b>	
410Cb	S41040
AM-363	S36300
Ferrium S53	S10500
Greek Ascoloy	S41800
Types 403, 410 & 416	S40300/S41000/S41600
Type 420	S42000
Type 422	S42200
Type 431	S43100
Type 440 A/B/C & F	S44002(A)/S44004(C)
<b>Precipitation Hardening</b>	
15-5 PH*	J92110/S15500
17-4 PH	S17400

GRADE	UNS
<b>ULTRA HIGH STRENGTH STEELS</b>	
17-22A(S)/17-22A(V)	K23015
18Ni Maraging (200 Grade)	K92810
18Ni Maraging (250 Grade)	K92890/K92940
18Ni Maraging (300 Grade)	K93120/K93160
300-M	K44220/K44540
4130	G41300
4140	G41400/J14046
4330V	J23260/K23080
4335V Mod	K33517
4340	G43400
52100	G52986
8630	G86300/J13042/J13050
9Ni Steel	K813403
9Ni-4Co	K91283
AerMet 100	K92580
AF 1410	K92571
D6A/D6AC	K24728/K24729
E9310	G93106
H-11 Mod	T20811
H-13	T20813
Hy-130/140/5Ni-Cr-Mo-V	K51255
Hy-Tuf	K32550
M50/M50 NiL Steels	K88165/T11350
Maraging T-250	K92150
Nitralloy 135 Mod	K24065

<b>LOW ALLOY STEELS</b>	
T-1	None

<b>BERYLLIUM ALLOYS</b>	
Beryllium	None

April 2009      Aerospace Structural Metals Handbook      Ferrous Alloys • **FeM**  
 Authors: Chris Kern      **Ferrium S53**  
 Paul Trestor

**1 General**  
 Ferrium S53 is a corrosion resistant, secondary hardening, ultra-high strength martensitic steel that exhibits good toughness, good general corrosion resistance, high resistance to stress corrosion cracking, excellent resistance to fatigue and notch fatigue, and very high bearing strength with an ultimate tensile strength of 280 ksi or greater. Ferrium S53 was designed as a replacement for 300M in landing gear components. The increased general corrosion resistance and high resistance to stress corrosion cracking allows for the elimination of cadmium coating of components. Greater general corrosion resistance leads to less component condemnations by allowing the component to be reworked within the dimensional tolerance limits for the component. The high resistance to stress corrosion cracking reduces the number of failures for components. Another benefit of Ferrium S53 is the high-temperature resistance of the alloy. The high-temperature resistance of Ferrium S53 reduces the amount of condemnations during processing due to grinding damage. In addition to landing gear components, Ferrium S53 has been applied to oil and gas applications and can be used in other applications requiring high strength with good corrosion resistance. (Refs. 1-3, 7, 10)

- 1.5.2 Normalizing: Heat to 1940–2012F, air cool, cool below -100F, hold 1 hour or longer, air warm.
- 1.5.3 Annealing: Heat to 1231–1281F, air cool.
- 1.5.4 Austenitizing: Heat to 1958–2012F, hold 60–70 minutes, oil quench or equivalent, cool below -100F, hold 1–3 hours, air warm.
- 1.5.5 Tempering: Heat to 922–946F, hold 2.5–3 hours, oil quench or equivalent, cool below -100F, hold 1–3 hours, air warm, heat to 882–918F, hold 11–14 hours, air cool.

<b>10.0</b>	<b>Fe</b>
<b>5.5</b>	<b>Cr</b>
<b>14.0</b>	<b>Ni</b>
<b>2.0</b>	<b>Co</b>
<b>1.0</b>	<b>Mo</b>
<b>0.3</b>	<b>W</b>
<b>0.21</b>	<b>V</b>
	<b>C</b>

- 1.6 **Hardness**  
 The hardness of Ferrium S53 after heat treatment is 52–55 Rockwell C. (Refs. 3, 7)
- 1.7 **Forms and Conditions Available**  
 1.7.1 [Table] Forms and conditions  
 Ferrium S53 is available in the form of bar, billet, and forging in the normalized and annealed condition. The microstructure of the mill annealed product is a

■ ニッケル基合金 (>5%Co, <5%Co), オーステナイト系ステンレス鋼、アルミ合金、マグネシウム合金、チタニウム合金、コバルト合金など収録

■ 商用製品との対照表も提供

**お問合せ先**

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