

**TIMETAL<sup>®</sup> 15-3****HIGH STRENGTH, COLD FORMABLE STRIP ALLOY**

TIMETAL 15-3 is a metastable beta titanium alloy that offers substantial weight reductions over other engineering materials. In the solution treated condition, it has excellent cold formability; in aged condition, it has high strength. TIMETAL 15-3 is a production alloy that is currently used for critical applications on air and space vehicles. TIMETAL 15-3 is usually acceptable for use at temperatures up to 550°F (288°C). Strip is available in gauges from 0.016 in (0.4mm) to 0.094 in (2.4mm). At thinner gauges, TIMETAL 15-3 is less expensive than TIMETAL<sup>®</sup> 6-4.

TABLE 1

**CHEMICAL COMPOSITION**

ELEMENT	WEIGHT %	
	Min.	Max.
Vanadium	14.0	16.0
Chromium	2.5	3.5
Tin	2.5	3.5
Aluminum	2.5	3.5
Oxygen	—	0.13
Nitrogen	—	0.05
Carbon	—	0.05
Hydrogen	—	0.015
Iron	—	0.25
Residual Elements, each	—	0.10
Residual Elements, total	—	0.40
Titanium	Remainder	

TABLE 3

**HEAT TREATMENT**

Solution Temperature	1450°F (790°C) air cool equivalent
Solution Time	3 - 20 min
Age Temperature	900°F (480°C) - 1150°F (620°C)
Age Time	4 - 16 hrs

TABLE 2

**PHYSICAL PROPERTIES**

PROPERTY	VALUE	
	English	SI
Density	0.173 lb in <sup>-3</sup>	4.78 g cm <sup>-3</sup>
Beta Transus	1375°-1425°F	750°-770°C
Tensile Modulus		
Solution Treated (Annealed)	11.9 Msi	82 GPa
Solution Treated plus Aged (1000°F [538°C])	15.5 Msi	107 GPa
Solution Treated plus Aged (900°F [482°C])	16.1 Msi	111 GPa

TABLE 4

**SPECIFIED MINIMUM TENSILE PROPERTIES FOR STRIP AFTER AGING****1450°F (790°C) SOLUTION HEAT TREATMENT; AIR COOL**

Aging Time hours	Aging Temp °F (°C)	UTS ksi (MPa)	0.2% YS ksi (MPa)	Elong. %
8	1000 (538)	145 (1000)	140 (965)	7
8	925 (496)	170 (1172)	160 (1103)	5
16	900 (482)	180 (1241)	170 (1172)	5



FIGURE 1

**THERMAL CONDUCTIVITY (K),  
SPECIFIC HEAT (C), AND  
COEFFICIENT OF THERMAL  
EXPANSION (α)**

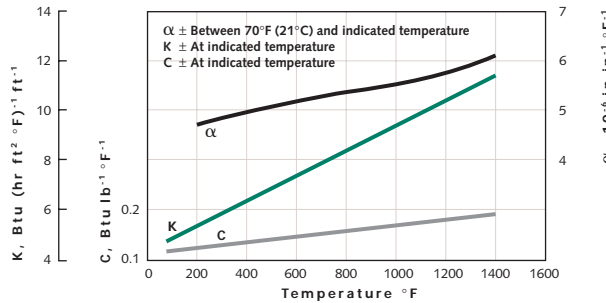


FIGURE 2

**TENSILE MECHANICAL  
PROPERTIES vs. TEMPERATURE**

1450°F (790°C) SOLUTION, AGED 1000°F (538°C)  
FOR 8 HRS

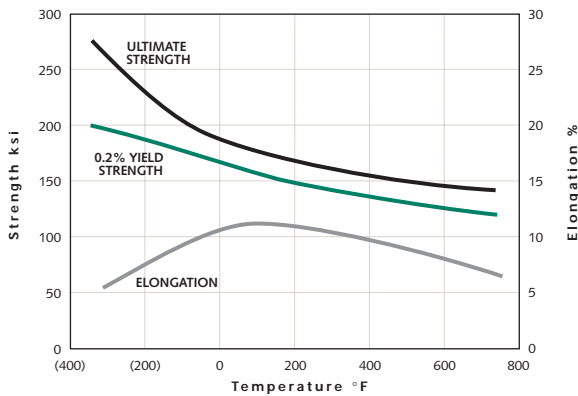


TABLE 6

**TYPICAL ROOM TEMPERATURE  
TENSILE PROPERTIES VARIOUS  
PRODUCT FORMS**

SOLUTION TREATED AND AGED AS INDICATED

Product	UTS ksi (MPa)	0.2% YS ksi (MPa)	Elongation %
Casting (HIP + 975°F (524°C), 12 hrs)	181 (1248)	170 (1172)	3.7
Forging (1000°F (538°C), 8 hrs)	172 (1186)	159 (1096)	13
GTA Weldment (950°F (510°C), 8 hrs)	172 (1186)	157 (1083)	7
EB Weldment (900°F (482°C), 8 hrs)	180 (1241)	145 (1000)	8

TABLE 5

**COLD FORMABILITY  
COMPARISON**

	TIMETAL 15-3	TI-6Al-4V
Bend	2.5t	4.5t
Springback	15°	16°
Bead	5/1	—
Draw (Cup)	46%	—
Joggle L/d	2	6
d/t	5	3
Flange Stretch	20%+	—
Flange Shrink	1%	—
Stretch Wrap	15%	3.5%

**TYPICAL APPLICATIONS**

- Airframe Structure
- Body Armor
- Ducts
- Knives
- Fire Extinguishers
- Foil
- Propellant Tanks
- Honeycomb
- Fasteners
- Hybrid Laminates
- Springs
- Metal Matrix Composites

The data and other information contained herein are derived from a variety of sources which TIMET believes are reliable. Because it is not possible to anticipate specific uses and operating conditions, TIMET urges you to consult with our technical service personnel on your particular applications.

For more information, please contact the TIMET Sales Office/Service Center nearest you, TIMET's Technical Laboratories or TIMET's Website @ [www.timet.com](http://www.timet.com)

**NORTH AMERICA**

Hartford, CT	860-627-7051
Toronto, OH	740-537-5600
St. Louis, MO	800-753-1550
Dallas, TX	817-329-5035
Tustin, CA	714-573-1000

**EUROPE**

Birmingham, England	44-121-356-1155
Savoie, France	33-4-79-89-73-73
Düsseldorf, Germany	49-211-230-880

**TECHNICAL SUPPORT**

Henderson, NV	702-566-4416
Birmingham, England	44-121-332-5381



First in Titanium Worldwide

