

UDIMAR® alloy 300 (UNS K93120) is an age-hardenable (maraging) iron-nickel steel combining ultra-high strength, toughness and resistance to crack propagation. The alloy is well suited to applications where heat treatment distortion and dimensional changes must be minimized and where high fracture toughness is required, such as rocket motor casings, light aircraft landing gear, power shafts and low temperature tooling.

The 18% nickel maraging steels offer a unique combination of properties not available from conventional low alloy ultra-high strength steels. They offer high strength, high ductility and toughness, and resistance to crack propagation. Hardening is accomplished by a simple aging cycle of 3 hours at 900°F (482°C) followed by air cooling. UDIMAR alloy 300 provides through hardening without quenching, freedom from decarburization, minimal distortion during aging, good formability, machinability, and weldability and a low coefficient of thermal expansion.

Available Products and Specifications

UDIMAR alloy 300 is designated UNS K93120 and is available as forging billet and bar.

Major specifications: AMS 6514

Typical Mechanical Properties

Table 3 - Typical Mechanical Properties of UDIMAR alloy 300

	Solution Annealed 1500°F (816°C), 1 hr, AC	Solution Annealed Plus Aged 900°F (482°C), 3 hrs, AC
0.2% Yield Strength, ksi	120	280
Ultimate Tensile Strength, ksi	150	290
Elongation, %	16	8
Reduction of Area, %	70	40
Hardness, Rc	30	52

Table 1 - Limiting Chemical Composition, %

Carbon	0.03 max.
Silicon	0.10 max.
Manganese	0.10 max.
Sulfur	0.010 max.
Phosphorus	0.010 max.
Cobalt	8.0-9.5
Nickel	18.0-19.0
Molybdenum	4.6-5.2
Titanium	0.55-0.80
Aluminum	0.05-0.15
Iron	Balance*

*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

Physical Constants

Table 2 - Physical Constants

Density, lb/in ³	0.290
g/cm ³	8.0
Melting Range, °F	2600-2650
°C	1427-1454
Specific Heat, Btu/lb•°F	0.08
J/kg•°K	335
Permeability at 200 Oersted (15.9 kA/m)	77.5
Coefficient of Expansion, 70-200°F, 10 ⁻⁶ in/in•°F	4.8
21-93°C, μm/m•°C	8.64
Thermal Conductivity, Btu•in/ft ² •h•°F	136
W/m•°C	19.6





www.specialmetals.com



U.S.A. Special Metals Corporation

Billet, rod & bar, flat & tubular products

3200 Riverside Drive
Huntington, WV 25705-1771
Phone +1 (304) 526-5100
+1 (800) 334-4626
Fax +1 (304) 526-5643

Billet & bar products

4317 Middle Settlement Road
New Hartford, NY 13413-5392
Phone +1 (315) 798-2900
+1 (800) 334-8351
Fax +1 (315) 798-2016

Atomized powder products

100 Industry Lane
Princeton, KY 42445
Phone +1 (270) 365-9551
Fax +1 (270) 365-5910

Shape Memory Alloys

4317 Middle Settlement Road
New Hartford, NY 13413-5392
Phone +1 (315) 798-2939
Fax +1 (315) 798-6860

United Kingdom

Special Metals Wigin Ltd.

Holmer Road
Hereford HR4 9SL
Phone +44 (0) 1432 382200
Fax +44 (0) 1432 264030

Special Metals Wire Products

Holmer Road
Hereford HR4 9SL
Phone +44 (0) 1432 382556
Fax +44 (0) 1432 352984

China

Special Metals Pacific Pte. Ltd.

Room 1802, Plaza 66
1266 West Nanjing Road
Shanghai 200040
Phone +86 21 3229 0011
Fax +86 21 6288 1811

Special Metals Pacific Pte. Ltd.

Room 910, Ke Lun Mansion
12A Guanghua Road
Chaoyang District
Beijing 100020
Phone +86 10 6581 8396
Fax +86 10 6581 8381

France

Special Metals Services SA

17 Rue des Frères Lumière
69680 Chassieu (Lyon)
Phone +33 (0) 4 72 47 46 46
Fax +33 (0) 4 72 47 46 59

Germany

Special Metals Deutschland Ltd.

Postfach 20 04 09
40102 Düsseldorf
Phone +49 (0) 211 38 63 40
Fax +49 (0) 211 37 98 64

Hong Kong

Special Metals Pacific Pte. Ltd.

Unit A, 17th Floor, On Hing Bldg
1 On Hing Terrace
Central, Hong Kong
Phone +852 2439 9336
Fax +852 2530 4511

India

Special Metals Services Ltd.

No. 60, First Main Road, First Block
Vasantha Vallabha Nagar
Subramanyapura Post
Bangalore 560 061
Phone +91 (0) 80 2666 9159
Fax +91 (0) 80 2666 8918

Italy

Special Metals Services Spa

Via Assunta 59
20054 Nova Milanese (MI)
Phone +390 362 4941
Fax +390 362 494224

The Netherlands

Special Metals Service BV

Postbus 8681
3009 AR Rotterdam
Phone +31 (0) 10 451 44 55
Fax +31 (0) 10 450 05 39

Singapore

Special Metals Pacific Pte. Ltd.

24 Raffles Place
#27-04 Clifford Centre
Singapore 048621
Phone +65 6532 3823
Fax +65 6532 3621

Affiliated Companies

Special Metals Welding Products

1401 Burris Road
Newton, NC 28658, U.S.A.
Phone +1 (828) 465-0352
+1 (800) 624-3411
Fax +1 (828) 464-8993

Canada House
Bidavon Industrial Estate
Waterloo Road
Bidford-On-Avon
Warwickshire B50 4JN, U.K.
Phone +44 (0) 1789 491780
Fax +44 (0) 1789 491781

Controlled Products Group

590 Seaman Street, Stoney Creek
Ontario L8E 4H1, Canada
Phone +1 (905) 643-6555
Fax +1 (905) 643-6614

A-1 Wire Tech, Inc.

A Special Metals Company
4550 Kishwaukee Street
Rockford, IL 61109, U.S.A.
Phone +1 (815) 226-0477
+1 (800) 426-6380
Fax +1 (815) 226-0537

Rescal SA

A Special Metals Company
200 Rue de la Couronne des Prés
78681 Epône Cédex, France
Phone +33 (0) 1 30 90 04 00
Fax +33 (0) 1 30 90 02 11

DAIDO-SPECIAL METALS Ltd.

A Joint Venture Company
Daido Shinagawa Building
6-35, Kohnan 1-chome
Minato-ku, Tokyo 108-0057, Japan
Phone +81 (0) 3 5495 7237
Fax +81 (0) 3 5495 1853

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