

S32100 UNS (USA)

Standards

UNS

Other designations

International

UR 321 - ArcelorMittal

USA

321 - AISI

5510 P - AMS

5557 H - AMS

5559 H - AMS

5645 - AMS

7211 - AMS

7490 - AMS

A 271 (321) - ASTM A271-96

AMS-QQ-S-763 - AMS

AS7325 - AMS

J2515 (321) - SAE J2515

J405 (321) - SAE J405:1998

J467 (321) - SAE J467

MIL T-8606 Ty.1 (321) - MIL

SAE 30321 - SAE

SPEC MIL-T-16286 (TP 321) - MIL

TP 321

Uniloy 321

5510 - AMS

5557 - AMS

5559 - AMS

5576 - AMS

5689 - AMS

7211 G - AMS

A 167 (321) - ASTM A167-99 (2009)

A 430 (321) - ASTM A430-91

AMS-QQ-S-763 (321) - FED

DMV 321

J405 (30321) - SAE J405:1998

J412 (30321) - SAE J412

MIL S-27419 (321) - MIL S-27419

QQ S-766 (321) - FED

SCF 19 Max - Carpenter Specialty Alloys

Stainless Type 321

Type 321 - Carpenter Specialty Alloys

Chemical composition

C (Carbon) < 0.08

P (Phosphorus) < 0.045

Si (Silicon) < 1.0

S (Sulphur) < 0.03

Mn (Manganese) < 2.0

Cr (Chromium) 17.0 - 19.0

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Ni (Nickel) 9.0 - 12.0

Ti (Titanium) < 0.7

Fe (Ferrum) Rest

Ti > 5°C

Properties

By ASTM A774

Yield Strength: > 205 MPa

Tensile Strength: 515 - 690 MPa

Elongation: > 40 %

Hardness HB: < 217

Hardness HRB: < 95

By ASTM A778

Transverse test pieces

Tensile Strength: > 515 MPa

Operational characteristics

By MSS SP-58

Application temperature: -29 - 649 °C

By Russian Maritime Register of Shipping

Application temperature: -165 - 600 °C

Class: A-5

Weldability

ASME Section IX

Brazing

P-Number: 102

Welding

P-Number: 8

Group: 1

By ISO 15608

Group: 8.1

By ISO 20421-1

By ISO/TR 15608

Group: 8.1

By ISO/TR 20173

By ASME/AWS

P-Number: 8

Group: 1

By ISO 15608

Group: 8.1

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Calculated Properties

Density: 7.79 g/cm³

Микроструктура: Metastable austenite

Modulus of elasticity (Young module)

Temperature -198°C: 210 GPa

Temperature -150°C: 207 GPa

Temperature -100°C: 203 GPa

Temperature -50°C: 200 GPa

Temperature 0°C: 196 GPa

Temperature 50°C: 193 GPa

Temperature 100°C: 189 GPa

Temperature 150°C: 186 GPa

Temperature 200°C: 183 GPa

Temperature 250°C: 179 GPa

Temperature 300°C: 176 GPa

Temperature 350°C: 172 GPa

Temperature 400°C: 168 GPa

Temperature 450°C: 165 GPa

Temperature 500°C: 160 GPa

Temperature 550°C: 156 GPa

Temperature 600°C: 151 GPa

Temperature 650°C: 146 GPa

Temperature 700°C: 140 GPa

Temperature 750°C: 134 GPa

Temperature 800°C: 127 GPa

Temperature 816°C: 125 GPa

Thermal conductivity

Temperature 21°C: 14.16 W/m^{°C}

Temperature 50°C: 14.61 W/m^{°C}

Temperature 100°C: 15.37 W/m^{°C}

Temperature 150°C: 16.11 W/m^{°C}

Temperature 200°C: 16.84 W/m^{°C}

Temperature 250°C: 17.57 W/m^{°C}

Temperature 300°C: 18.30 W/m^{°C}

Temperature 350°C: 19.02 W/m^{°C}

Temperature 400°C: 19.75 W/m^{°C}

Temperature 450°C: 20.46 W/m^{°C}

Temperature 500°C: 21.17 W/m^{°C}

Temperature 550°C: 21.87 W/m^{°C}

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Temperature 600°C: 22.56 W/m*°C
Temperature 650°C: 23.23 W/m*°C
Temperature 700°C: 23.90 W/m*°C
Temperature 750°C: 24.57 W/m*°C
Temperature 800°C: 25.25 W/m*°C
Temperature 816°C: 25.48 W/m*°C

Linear expansion coefficient

Temperature 50°C: 15.6 (10⁶)/°C
Temperature 100°C: 16.2 (10⁶)/°C
Temperature 150°C: 16.6 (10⁶)/°C
Temperature 200°C: 17.1 (10⁶)/°C
Temperature 250°C: 17.4 (10⁶)/°C
Temperature 300°C: 17.7 (10⁶)/°C
Temperature 350°C: 17.9 (10⁶)/°C
Temperature 400°C: 18.1 (10⁶)/°C
Temperature 450°C: 18.3 (10⁶)/°C
Temperature 500°C: 18.4 (10⁶)/°C
Temperature 550°C: 18.6 (10⁶)/°C
Temperature 600°C: 18.8 (10⁶)/°C
Temperature 650°C: 19.0 (10⁶)/°C
Temperature 700°C: 19.2 (10⁶)/°C
Temperature 750°C: 19.4 (10⁶)/°C
Temperature 800°C: 19.4 (10⁶)/°C
Temperature 816°C: 19.4 (10⁶)/°C

Thermal diffusivity

Temperature 21°C: 3.6 10⁶ m²/s
Temperature 50°C: 3.6 10⁶ m²/s
Temperature 100°C: 3.8 10⁶ m²/s
Temperature 150°C: 3.9 10⁶ m²/s
Temperature 200°C: 4.0 10⁶ m²/s
Temperature 250°C: 4.1 10⁶ m²/s
Temperature 300°C: 4.2 10⁶ m²/s
Temperature 350°C: 4.3 10⁶ m²/s
Temperature 400°C: 4.4 10⁶ m²/s
Temperature 450°C: 4.6 10⁶ m²/s
Temperature 500°C: 4.7 10⁶ m²/s
Temperature 550°C: 4.8 10⁶ m²/s
Temperature 600°C: 4.9 10⁶ m²/s
Temperature 650°C: 5.0 10⁶ m²/s

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Temperature 700°C: 5.1 10⁶ m²/s

Temperature 750°C: 5.2 10⁶ m²/s

Temperature 800°C: 5.3 10⁶ m²/s

Temperature 816°C: 5.3 10⁶ m²/s

Additional information

Austenitic steel