# Ualloy750 (Alloy X-750)

Alloy X-750 refers to Inconel X-750, is an austenitic, nickel based alloy.
It is non-magnetic and resistant to both reducing acids and oxidizing acids. Good corrosion resistance and oxidation resistance below 980℃, high strength below 800℃, and good relaxation resistance below 540℃.

## Alloy X-750| Inconel X-750 Material Chemical Composition

| C | Cr | Ni | Co | Al | Ti | Fe | Nb | Si | Mn | P | S | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ≤0.08 | 14-17 | ≥70 | ≤1.00 | 0.4-1.00 | 2.25-2.75 | 5-9 | 0.7-1.2 | ≤0.5 | ≤1.00 | ≤0.015 | ≤0.010 | ≤0.5 |

## Alloy X-750| Inconel X-750 Material Properties

| Grade | Density | Melting Point | Alloy X-750| Inconel X-750 Mechanical Properties | | | | | Stress Rupture | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tensile strength | Yield Strength | Elongation | Reduction of area | Hardness Brinell | Temperature | Stress | Min Hours | Elongation |
| Type 1 | 8.25 | 1395-1425℃ 2543-2597℉ | 140KSI 965MPa | 90 KSI 620 MPa | 8 | / | ≥262 | 1350℉ 732℃ | 310Mpa | 100 | 5 |
| Type 2 C | | | 170KSI 1170Mpa | 115 KSI 790 MPa | 18 | 18 | 302-363 | / | / | / | / |
| Type 2 D | | | 170KSI 1170 Mpa | 115 KSI 790 MPa | 15 | 15 | 302-363 | / | / | / | / |
| Type 3 | | | 160KSI 1103 Mpa | 100 KSI 689 MPa | 20 | 20 | 267-363 | / | / | / | / |
| Type 3 | | | 185KSI | 130 KSI | | | | / | / | / | / |

Web: Ualloy.com
Tel: 86-0571-63255636
Fax: 86-0571-63256181
E: sales@ualloy.com

Information presentation property of Ualloy

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1276 Mpa | 896 MPa | | | | | | | |

## Alloy X-750| Inconel X-750 Applications

Automatic Engine Valve Springs

Tanks

Piping

Heat Exchangers

Pumps and Valves

| Alloy Name | Trade Name | UNS NO. | Germany Spec | French Spec | Specification |
|---|---|---|---|---|---|
| Alloy X-750 | Inconel X-750 | UNS N07750 | WS 2.4669 | / | ASTM B637<br>AMS 5699 |

## Inconel X-750 Heat Treatment

| Grade | Recommended Solution Treatment | Recommend Stabilizing Treatment | Precipitation Hardening Treatment |
|---|---|---|---|
| Alloy X-750| Inconel X-750 Type 1 | 2100±25℉（1149±14℃）， hold 2 to 4 h, air cool | 1550±25℉（843±14℃）， hold 24h, air cool | 1300±25℉（704±14℃）， hold 20h, air cool or furnace cool |
| Alloy X-750| Inconel X-750 Type 2 | 1800 ±25℉（982±14℃）, hold1/2 h min, cool at rate equivalent to air cool or faster | / | 1350±25℉（732±14℃）， hold 8h, furnace cool to 1150±25℉（621±14℃）， hold until total precipitation heat treatment has reached 18h, air cool |
| Alloy X-750| Inconel X-750 Type 3 | 1975-2050℉（1079-1121℃）， hold 1 to 2 h, air cool | / | 1300 ±25℉（704±14℃）， hold 20h,+4-0h, air cool |

## Alloy X-750| Inconel X-750 Temperature Range

Alloy X-750| Inconel X-750 Type 1 and 2 service above 1100℉(593℃).

Web: Ualloy.com
Tel: 86-0571-63255636
Fax: 86-0571-63256181
E: sales@ualloy.com

Information presentation property of Ualloy

## Alloy X-750| Inconel X-750 Thermal Conductivity

| θ/℃ | 50 ℃ | 100℃ | 300℃ | 500℃ | 900℃ |
|---|---|---|---|---|---|
| W/(m·℃) | 14.7 | 15.9 | 20.1 | 25.1 | 37.3 |

## Alloy X-750| Inconel X-750 Coefficient of Thermal Expansion

| θ/℃ | 20-200 | 20-300 | 20-400 | 20-500 | 20-600 | 20-700 | 20-800 |
|---|---|---|---|---|---|---|---|
| α | 13.1 | 13.5 | 14.1 | 14.4 | 15.0 | 15.6 | 16.2 |

## Alloy X-750| Inconel X-750 Modulus of Elasticity

| θ/℃ | 68℉<br>20℃ | 392℉<br>200℃ | 572℉<br>300℃ | 752℉<br>400℃ | 932℉<br>500℃ | 1112℉<br>600℃ | 1292℉<br>700℃ | 1472℉<br>800℃ |
|---|---|---|---|---|---|---|---|---|
| E/GPa | 213.7 | 205.9 | 200.1 | 194.2 | 186.3 | 178.5 | 169.7 | 160.8 |

## Alloy X-750| Inconel X-750 Hydrogen Embrittlement

Reference: Hydrogen-assisted Failure of Alloys X-750 And 625 Under Slow Strain-rate Conditions- R.S.Daum, A.T.Motta, D.A.Koss, and D.D. Macdonald

Inconel X-750 in AH and HTH heat treatment showed a pronounced susceptibility to hydrogen embrittlement at room temperature.

Inconel X-750 in AH and HTH heat treatment showed no hydrogen embrittlement at 288℃ （550.4℉）

Incoloy is a trademark of high-performance nickel-based alloys developed by Special Metals Corporation.

Inconel is a trademark of high-performance nickel-based alloys developed by Special Metals Corporation.

Web: Ualloy.com
Tel: 86-0571-63255636
Fax: 86-0571-63256181
E: sales@ualloy.com

Information presentation property of Ualloy