

Nickel-based Alloy

PYRAD44DW

X8NiCrMoTi42

Consumable electrode remelted version

SPECIFICATIONS

European standard:

- X8NiCrMoTi42

WL : 2.4662
 UNS : N09901
 BS : HR53

COMPOSITION

| | |
|-----------------|--------|
| Carbon..... | ≤0.10 |
| Nickel..... | 42.00 |
| Iron..... | 35.00 |
| Chromium..... | 13.00 |
| Molybdenum..... | 5.50 |
| Titanium..... | 2.90 |
| Cobalt..... | ≤ 1.00 |

TYPICAL MECHANICAL PROPERTIES

On metal supplied ready for use:

- Tensile test at ambient temperature:
 - UTS: 1200 N/mm²
 - 0.2 % Yield strength: 890 N/mm²
 - Elongation (5d): 14 %

- Rapid tensile test at temperature:

| Temperature in °C | UTS in (N/mm ²) | 0.2 % Yield strength in (N/mm ²) | Elongation (5d) in % |
|-------------------|-----------------------------|--|----------------------|
| 200 | 1150 | 860 | - |
| 400 | 1090 | 820 | - |
| 500 | 1045 | 795 | 14 |
| 600 | 1000 | 770 | 13 |
| 700 | 880 | 710 | 15 |

- Creep:

| Temperature in °C | Average load in N/mm ² causing creep fracture in 1000 hrs |
|-------------------|--|
| 600 | 580 |
| 650 | 440 |
| 700 | 310 |
| 750 | 190 |
| 800 | 65 |

APPLICATIONS

- Gas turbine parts.
- Compressor discs.
- Rotors.

CHARACTERISTICS

Precipitation hardened, refractory alloy with:

- Very good resistance to oxidation at temperatures between 550°C and 750°C.

HEAT TREATMENT

- Solution treatment and ageing:
1090°C / water + 770°C / Air cool +710°C / Air cool

PHYSICAL PROPERTIES

- Density:

| | |
|-------------|-----|
| - at 20°C: | 8.2 |
| - at 400°C: | 8.1 |
| - at 800°C: | 7.9 |
- Thermal conductivity in W.m/m².°C:

| | |
|-------------|----|
| - at 20°C: | 13 |
| - at 200°C: | 15 |
| - at 400°C: | 17 |
| - at 600°C: | 19 |
- Mean coefficient of expansion in m/m.°C:

| | |
|---------------------------|--------------------------|
| - between 20°C and 200°C: | 14.10 x 10 ⁻⁶ |
| - between 20°C and 400°C: | 14.70 x 10 ⁻⁶ |
| - between 20°C and 600°C: | 15.55 x 10 ⁻⁶ |
| - between 20°C and 800°C: | 16.75 x 10 ⁻⁶ |
- Modulus of elasticity in N/mm²:

| | |
|-------------|-----------------------|
| - at 20°C: | 206 x 10 ³ |
| - at 200°C: | 194 x 10 ³ |
| - at 400°C: | 177 x 10 ³ |
| - at 600°C: | 159 x 10 ³ |
| - at 800°C: | 142 x 10 ³ |

FORGING

- 1175/900°C

Contact:

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