

The material 1.4512 / AISI 409 is a rust-resistant ferritic chromium steel. Due to the titanium content, the material is more corrosion resistant than the ferritic material 1.4003, but the corrosion resistance is lower than that of austenitic stainless steels. Compared to these, however, the material 1.4512 / AISI 409 has a better resistance to stress corrosion cracking. The material is suitable for cold forming and is used, among other things, in the automotive industry or in mechanical engineering.

Chemical composition (mass fraction in % according to DIN EN 10088)

| C | Si | Mn | P | S | N | Cr | Cu | Mo | Ni | Ti | Other |
|---------|--------|--------|---------|---------|---|------------|----|----|----|----------------------------|-------|
| ≤ 0,030 | ≤ 1,00 | ≤ 1,00 | ≤ 0,040 | ≤ 0,015 | - | 10,5 -12,5 | - | - | - | [6 × (C + N)] bis 0,65 [◇] | - |

[◇] Stabilisation can be achieved by using titanium, niobium and/or zirconium.

According to the atomic mass and the proportion of carbon + nitrogen, the following applies: Nb (mass proportion in %) = Zr (mass proportion in %) = 7/4 Ti (mass proportion in %).

Specifications

| | |
|----------------|----------|
| EN-Grade | 1.4512 |
| EN-short name | X2CrTi12 |
| EN-standard | 10088 |
| AISI | 409* |
| B.S. | 409S19 |
| JIS | SUH409L |
| Microstructure | Ferrite |

Physical properties

| | |
|---|---------|
| Magnetisability: | present |
| Density(kg/dm ³) | 7,7 |
| Thermal conductivity (at up to 20°C) | 25 |
| Electronic resistance at Room temperature (in Ω mm ² /m) | 0,60 |

Possible areas of application

Facility engineering
Automotive industry
Construction industry
Fastening elements
Household appliance manufacturing
Mechanical Engineering
and more

Mechanical properties at room temperature in the annealed condition (according to EN 10088)

| Form of production | Ø mm / Max | 0,2 % Yield strength | | Tensile strength R _m in Mpa | Elongation at break A in% (longitudinal) |
|--------------------|---------------|---|------------------------------------|---|---|
| | | R _{p0,2} (longitudinal) Mpa | R _{p0,2} (transverse) Mpa | | |
| cold rolled strip | 8 | ≤ 210 | ≤ 220 | 380 - 560 | 25 |
| hot rolled strip | 13,5 | ≤ 210 | ≤ 220 | 380 - 560 | 25 |

Minimum values of the 0.2 % proof stress at elevated temperature in the annealed condition (according to EN 10088)

| Temperature in °C | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 |
|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Minimum 0,2 % Yield strength MPa | 200 | 195 | 190 | 185 | 180 | 160 | - | - | - | - |

(* based on)

Heat treatment and hot forming

| | |
|-------------------------------|--------------|
| Hot forming | 800-1100 °C |
| Cooling through air | |
| Annealing | 770 - 830 °C |
| Cooling through air and water | |

Welding

The material 1.4512 has poor welding properties and in the high temperature range the material is sensitive to embrittlement due to grain growth. The harmful influences can be better controlled when working in the low range, with a welding energy lower than 1kJ/mm. Due to the addition of titanium, hydrogen or nitrogen containing gas should be avoided.

If you have further questions about this or any other product, please contact our team at +49 2263-9240-0 or email agst@agst.de

Please note:

The information given in this material data sheet has been compiled to the best of our knowledge and is based on the current version of the relevant standard. We accept no liability for any errors.