

## Chemical analysis

|      | C     | Si   | Mn   | S     | P     | Cr   | Ni   | Mo   | Cu   | N    |
|------|-------|------|------|-------|-------|------|------|------|------|------|
| Min. |       |      |      |       |       | 19.5 | 17.5 | 6.00 | 0,50 | 0.18 |
| Max  | 0.020 | 0.80 | 1.00 | 0.010 | 0.030 | 20.5 | 18.5 | 6.50 | 1.00 | 0.22 |

## Microstructure

S254SMO is a super austenitic stainless steel, with excellent resistance to pitting, crevice corrosion and high mechanical strength.

## Comparable standard

| Standard   | Designation/Type     |
|------------|----------------------|
| UNS        | S31254               |
| ASTM A 182 | F44                  |
| EN         | 1.4547               |
| DIN        | X2CrNiMnMoNNb20-18-7 |

## Main features and applications

General areas of application are:

- Oil and gas industry. (Valves, fittings, pumps, flanges, heat exchangers.)
- Marine industry.
- Chemical industry.

These areas take advantage of:

- High resistance to stress corrosion cracking in chloride-containing environments.
- High resistance to general corrosion, pitting and crevice corrosion.
- High resistance to erosion corrosion and corrosion fatigue.
- High mechanical strength.

## Process

Produced from scrap and alloys. Melting process: Electric Arc Furnace + AOD.  
 Forged on a free-form 1600 t hydraulic press.

## Minimum mechanical properties at room temperature

| Yield strength<br>Rp <sub>0.2</sub> [MPa] | Tensile strength<br>Rm [MPa] | Fracture<br>Elongation<br>A [%] | Area<br>contraction<br>Z [%] | Hardness<br>HRB |
|---|------------------------------|---------------------------------|------------------------------|-----------------|
| 300                                       | 650                          | 35                              | 50                           | Max. 220        |

## Heat treatment

Solution annealing at min. 1150°C, followed by water quenching.

## Weldability

S254SMO belongs to group 8.2, austenitic stainless steel with Cr > 19%, according to ISO/TR 15608:2013. The weldability of S254SMO is good.

## Physical properties at room temperature (typical values)

| Density,<br>20 °C<br>[kg/m <sup>3</sup> ] | Relative<br>magnetic<br>permeab. | Coefficient of<br>thermal expansion |                                   | Specific<br>heat, 20°C<br>[J/(kg K)] | Thermal<br>conductivity<br>[W/m K] | Electrical<br>resistivity<br>[Ωmm <sup>2</sup> /m] | Young's<br>modulus,<br>20 °C<br>[GPa] |
|---|----------------------------------|-------------------------------------|-----------------------------------|--------------------------------------|------------------------------------|--|---------------------------------------|
|   |                                  | Range<br>[°C]                       | Coefficient<br>[K <sup>-1</sup> ] |                                      |                                    |  |                                       |
| 8000                                      | -                                | 20 – 100                            | 16.5·10 <sup>-6</sup>             | 485                                  | 13,5                               | 0.85   | 195                                   |
|   |                                  | 20 – 200                            | 17.0·10 <sup>-6</sup>             |                                      |                                    |  |                                       |
|   |                                  | 20 – 300                            | 17.5·10 <sup>-6</sup>             |                                      |                                    |  |                                       |
|   |                                  | 20 – 400                            | 18.0·10 <sup>-6</sup>             |                                      |                                    |  |                                       |