Remanit® 4301

Material number

1.430 1 · DIN X 5 CrNi 18 10 · NF Z 7 CN 18-09 · ASTM 304 · SIS 2332/33 · BS 304 S 31 · EN X5CrNi18-10

* To DIN 17440 and EN 10088

Chemical composition*

	C	Cr	Ni	N
min.	-	17.0	8.0	-
max.	0.07	19.5	10.5	0.11

* Data to EN 10088 in % by mass

Depending on the properties desired, special agreements can be reached within the specified analysis limits.

Mechanical properties*

At room temperature in solution-annealed condition and resistance to intercrystalline corrosion

Size range mm	0.2% proof stress (Rp 0.2) min. N/mm²	1% proof stress (Rp 1.0) min. N/mm²	Tensile strength (Rm) N/mm²	Elongation after fracture A5 min. in % Long.	Trans.	Notched bar impact work min. in J Long.	Trans.	Resistance to intercrystalline corrosion In as-delivered condition	In sens. condition
d ≤ 160	190	225	500 to 700	45	35	100	60	Yes	No*
160 < d ≤ 250									

* Sensitisation treatment lasting 15 min. at 700 °C with subsequent cooling in air

* Data to EN 10088

The mechanical properties have to be agreed on for thicker dimensions, as the delivered product is based on the values given.

At elevated temperatures

Temperature in °C	100	150	200	250	300	350	400	450	500	550
0.2% proof stress ($Rp_{0.2}$) min.	155	140	127	118	110	104	96	95	92	90
1% proof stress ($Rp_{1.0}$) min. in N/mm²	190	170	155	145	135	129	125	122	120	120

Hot forming / Heat treatment, structure

Hot forming

°C	Cooling
1200 to 900	Air

AT heat treatment, structure

°C	Cooling	Structure
1000 to 1100	Water, air	Austenite with very small ferrite component

Physical properties*

Density at 20 °C	Modulus of elasticity kN/mm² at			Thermal conductivity at 20 °C	Specific heat at 20 °C	Resistivity at 20 °C
kg/dm³	20°C	200°C	400°C	W/mK	J/kgK	Ω mm²/m
7.9	200	186	172	15	500	0.73

* Data to EN 10088

Thermal expansion in 10^{-6} K^{-1} between 20 °C and

100 °C	200 °C	300 °C	400 °C	500 °C
16.0	16.5	17.0	17.5	18.0

The material may be slightly magnetisable in quenched condition. The higher the degree of cold forming, the higher the magnetisability.

Processing

The possibilities for cold forming REMANIT 4301 are very good. The considerably greater strain hardening compared to plain steel grades demands correspondingly higher forming forces. In general, the regulations set out in AD Data Sheet HP7/3 should be complied with during cold and hot forming, as well as any heat aftertreatment.
The annealing colours or scaling occurring during hot forming or welding impair the corrosion resistance. They must be removed by pickling, grinding or sand-blasting (iron-free!).
Metal-cutting machining has to be performed with tools made of high-quality high-speed steel (good cooling necessary), or preferably carbide cutting tools, owing to the strain hardening and the low thermal conductivity.
The material versions REMANIT 4301 IM and REMANIT 4301 SUPER IM display better cutting properties owing to the specific addition of sulphur or sulphur and calcium.
REMANIT 4301 can be polished.

Welding

Good weldability using all processes (except gas welding).

* Only if permissible considering the corrosion stress

Filler metals:

	Identical or similar		More highly alloyed			
Thermanit	J	JE	21/ 10E	H	G*	A*

Max. working temperature (interpass temperature): 250 °C. Heat treatment after welding is not necessary.
Authorisations: The material and filler metal are authorised for pressure vessel construction.

Notes on use

Owing to its good corrosion resistance, cold formability and weldability, REMANIT 4301 is widely used in apparatus and tank construction, for fittings in equipment for the processing of food and tobacco goods, and in medical systems.
REMANIT 4301 is resistant to intercrystalline corrosion during continuous operation at up to 300 °C .