

Märker[®] MARESIST[®] G 4565 S

MATERIAL DATA SHEET

Märker® MARESIST® G 4565 S is high Nitrogen containing Superaustenitic Steel Grade with remarkable corrosion resistance and high yield strength.

Märker® MARESIST® G 4565 S shows excellent weldability.

Application:

- Castings for severe corrosion service, e. g. in chemical and environmental facilities
- Offshore industry
- shipbuilding
- chemical industry
- pulp and paper industry
- seawater desalination plants with improved corrosion resistance, e. g. high CPT and CCT resistance also in the as welded condition

Corrosion resistance:

Märker® MARESIST® G 4565 S features excellent corrosion resistance in a wide range of corrosive media especially in high-chloride environments with strong pitting and crevice corrosion potential. The pitting resistance index $PRE_{(N)}$ is considered to measure the resistance against pitting and crevice corrosion and is determined by the content of the alloying elements Chromium,

Molybdenum and Nitrogen. Due to the high amount of these elements in Märker® MARESIST® G 4565 S a pitting index of at least 45 can be achieved.

In a ferric(III)chloride solution according to ASTM G 48-92 a critical pitting temperature of 80°C could be observed, similar results have been reached in the welded condition.

Chemical composition:

in weight % (cast analysis)									
C	Si	Mn	P	S	Cr	Mo	Ni	Nb	N
max.	max.	5.0	max.	max.	23.0	4.0	16.0	max.	0.40
0.03	1.0	7.0	0.025	0.015	25.0	5.0	18.0	0.10	0.60

$(PRE_{(N)}): \%Cr+3.3\%Mo+16\%N \geq 45$

Märker® MARESIST® G 4565 S is melt in an induction melting furnace with high quality ingredients.

Mechanical properties:

Heat treatment condition	Ruling thickness [mm] max.	0,2%-proof strength [MPa] min.	1,0%-proof-strength [MPa] min.	Tensile strength [MPa] min.	Elongation ($l_0=5d_0$) [%] min.	Notched impact energy (mean value) ISO-V [J] min.
+AT ¹	250	325	350	600-750	35	100

The values for the mechanical properties are valid for room temperature and were taken at test pieces with a maximum thick-

ness of 150 mm. For test pieces, which are separated from a cast piece, the values for the extension and the notched impact energy have to be agreed.

0,2%-proof stress at elevated temperatures:

Temperatur [°C]	100	200	300
R _{p0,2} [MPa] min.	275	210	190

Guidance data for heat treatment:

solution annealing: ≥ 1150°C / water

Structure: Steel casting Märker® MARESIST® G 4565 S offers after the heat treatment a solid austenitital structure as a rule, due to the very high nitrogen concentration.

Guidance data for physical properties:

Gravity [g/cm ³] at 20°C	Thermal conductivity [W/m K] at 20°C	Thermal expansion [10 ⁻⁶ K ⁻¹] between 20°C and			Specific heat [J/kg K] at 20°C
		100°C	300°C	500°C	
8.0	14.5	14.5	16.3	17.2	450

Magnetism: not available ²

Guidance data for welding

Märker® MARESIST® G 4565 S has a very good weldability. A suitable filler metal is NiMoC res EL-NiCr22Mo16. In comparison to the 6% Mo containing steel grade the weldability is much better.

The small decrease of CPT is important for Märker® MARESIST® G 4565 S also in the welded condition.

¹ AT (solution annealed and quenched)

² a very weak magnetisability may occur in the solution annealed condition

Information provided on material quality and recommendations for use are intended as a reference only. Such information is based on practical experience as well as on the findings obtained through our research and development work. Although all specifications concerning the characteristics and applications mentioned in this data sheet occur to the best of our knowledge, liability has to be excluded.

Production sites

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S+C ALFANAMETAL s.r.o.
Czech Republic

S+C MÄRKER GmbH
Germany

S+C Bowers & Jones Ltd.
Great Britain

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