

Technical Data Sheet

UGI® 202N – Grade 1

Chemical analysis (%)

C	Si	Mn	Cr	Ni	Mo	N	P	S
0.05 – 0.10	0.3 – 0.6	9.0 – 10.0	17.5 – 18.5	5.0 – 6.0	-	0.25 – 0.32	≤ 0.030	≤ 0.015

22-09-2017 – REV 00

General presentation

UGI® 202N is an austenitic stainless steel with a high manganese content, which belongs to the 200 serie.

This property makes UGI® 202N interesting for electronic, medical and measurement equipment.

With its high content in manganese and in nitrogen, UGI® 202N is a completely amagnetic steel even at very low temperature and even after a high amount of cold work. So UGI® 202N is designed

The high manganese content gives of UGI® 202N an excellent wear resistance. So UGI® 202N is well adapted for stainless steel filters in aggressive water environment like mine filtration or water well filtration.

- To cryogenic environment, liquid nitrogen or even liquid hydrogen.
- For amagnetic spring wires with absolutely no interference with electromagnetics waves.

Resistance to corrosion abrasion of UGI® 202N is better than 304 and 316L.

Classification

Austenitic stainless steel, 200 serie

Designation

Material N°

Europe EN		USA AISI	UNS	Japan SUS
1.4374	X8CrMnNiN18-9-5	202 *	S20200 *	SUS202 *

* Except for N

Mechanical properties

Tensile data

Temperature°C	UTS (MPa)	YS (MPa)	Elongation (%)	Striction (%)
20	680 - 750	320 - 450	55 - 70	65 - 80

Typical tensile values in the annealed condition

Rm and Rp 0,2% obtained after cold work can be much higher (see chapter cold transformation).

Physical properties

Temperature (°C)	Density (kg/dm³)	Elastic modulus (GPa)	Thermal conductivity (W.m ⁻¹ .K ⁻¹)	Expansion coefficient (10 ⁻⁶ .K ⁻¹)	Electrical resistivity (μΩ.cm)	Specific heat (J.kg ⁻¹ .K ⁻¹)
20	7,8	200	12	-	73	500
100			14	16.5		
200			16			
300			18	18		



Swiss Steel Group

Production sites: Ugitech SA
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Magnetic permeability (μ_r) of UGI® 202N is very low in annealed condition ($\mu_r < 1,005$).

Even after a high amount of cold work (> 80% of section reduction) magnetic permeability of UGI® 202N remains very low: $\mu_r < 1,01$.

Corrosion resistance

UGI® 202N provides a good corrosion resistance in mildly aggressive environments.

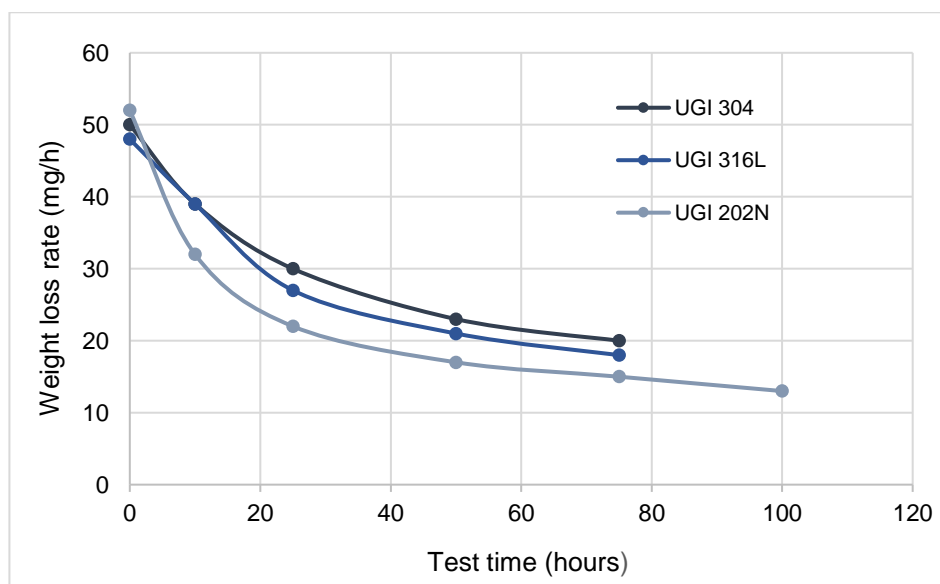
UGI® 202N is recommended for medium with limited concentration in chlorinated components.

High surface hardness in the work-hardened condition and very good corrosion-abrasion properties have led to its use in water and coal filtration industries.

The figure below shows the corrosion behavior of UGI® 202N after an abrasion-corrosion test. This test quantifies the rate of weight loss of specimens in an sulfuric acid solution with projection of silicon carbide particles.

The solution of H_2SO_4 is at pH=3 and SiC particles (diameter 105 μm and concentration 50 g/l) are projected at a speed of 10 m/s.

Grade UGI® 202N appears very good, outperforming AISI 304 and even AISI 316L.



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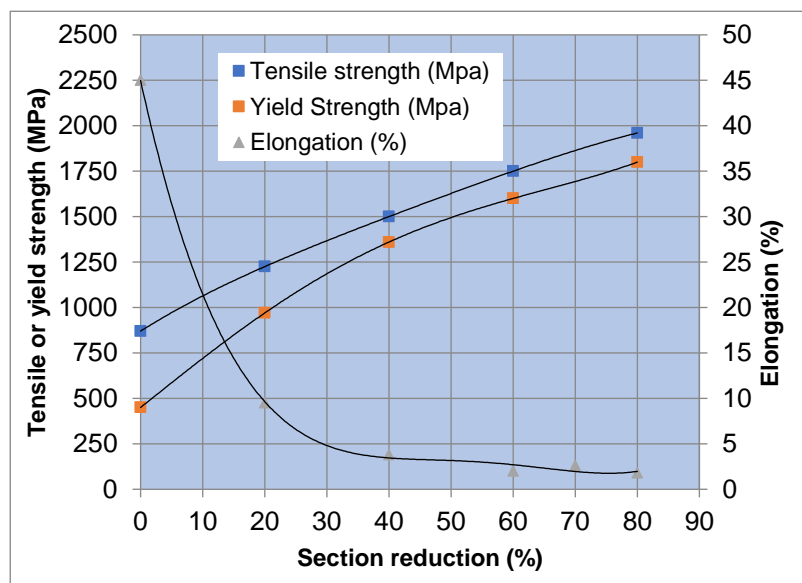
Hot transformation

UGI® 202N has good forging properties. Forging temperatures should be in the range of 900°C to 1100°C.

After forging, cooling should be quick in order to avoid sensitisation by chromium carbide formation and potential corrosion at grain boundaries.

Cold transformation

Drawing Like other austenitic steels, drawing UGI® 202N is not difficult. It strain hardens rapidly with reduction of section but its natural ductility allows to go above 80% of section reduction. The ratio between yield strength and tensile strength after cold work hardening is around 0,9.



Mechanical characteristics reached after a high section reduction are significantly higher than those obtained in annealed condition. These high mechanical characteristics makes UGI® 202N most adequate for amagnetic springs. Table below gives indicatives mechanical characteristics.

For diameter below 0,5 mm and above 6,0 mm contact us.

Diamètre nominal (mm)	Tensile strength (typical values) (MPa)	Yield strength (typical values) (MPa)
0.50 < d ≤ 0.65	2000	1850
0.65 < d ≤ 1.25	1975	1825
1.25 < d ≤ 1.75	1950	1800
1.75 < d ≤ 2.00	1925	1775
2.00 < d ≤ 2.50	1900	1750
2.50 < d ≤ 3.00	1850	1700
3.00 < d ≤ 3.50	1750	1600
3.50 < d ≤ 4.25	1650	1500
4.25 < d ≤ 5.00	1550	1400
5.00 < d ≤ 6.00	1500	1350



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Heat treatment

Mechanical characteristics of spring wire can be increased by approximately 250 MPa (depending on diameters) with a thermal treatment applied to springs.

Static furnace treatment:

– T° of treatment, 350/450 °C

Recommended duration, 0.5 to 1 hour depending on batch size

Continuous furnace treatment:

– T° of treatment, 25 °C more

Minimum duration, 3 minutes than with static furnace treatment

Available products

Product	Form	Aspect	Tolerance	Dimension	
Drawn wire	Round	Mat		0.5 – 6.0	mm
	Profiles	Bright		2 – 70	mm ²
Wire rod	Round	Pickled		5 – 32	mm
Bars	Round	Drawn	h9	3 – 30	mm
	Round	Turned and polished	h10 – h11	22 – 71	mm

Other contact us.

Applications

- Wear resistant part in corrosive environment as for example water filtration, coal mines filters
- Amagnetic spring wire.
- Cryogenic spring.



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