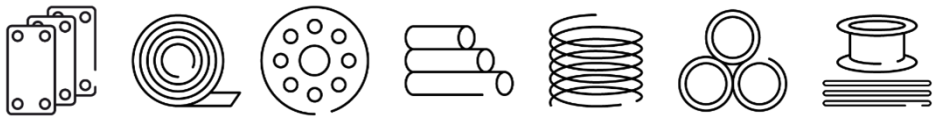
Alloy 201 I LC-Ni99 I 2.4068
High Performance Alloys Data Sheet

Zapp is certified to ISO 9001



Alloy 201

- Alloy 201 is technically pure nickel with high ductility, good thermal conductivity and outstanding resistance to numerous corrosive media
- limited carbon content of max. 0.025 %
- This material offers good corrosion resistance under reducing conditions, e.g. hydrofluoric and hydrochloric acid. Under oxidizing conditions, a corrosion-resistant protective film forms on the surface, to which the good resistance to sodium hydroxide, hydrogen chloride (dry), bromine and fluorine (dry) can be attributed.
- Alloy 201 exhibits good resistance to stress-crack corrosion in both caustic alkali and chloride-containing solutions. In sodium hydroxide at operating temperatures from approx. 300 to 450 °C, Alloy 201 should be used in order to reduce the risk of inter crystalline corrosion.

Application

- Chemical and petrochemical engineering, e.g. heater tubes, tube bundles and trays of an evaporator in a sodium hydroxide plant
- Equipment components for salt production, e.g. heat exchangers, centrifuges and fittings.
- Food and beverage industry: equipment components for food processing, e.g. fruit juice processing plants

Please get further information under:
https://www.zapp.com/en-us/materials/high-performance-alloys-ni-co-ti

Specifications

	Material 201
DIN Designation	LC-Ni99
DIN Material Number	2.4068
VdTÜV Datasheet	345
BS	3072/NA12, 3073/NA12, 3074/NA12, 3075/NA12, 3076/NA12
AMS	5553
UNS	N02201
DIN	17740, 17750, 17751, 17752, 17753, 17754
ASTM	B 160, B 161, B 162, B 163
ASME	SB 160, SB 161, SB 162, SB 163

Delivery forms

Sheet	hot or cold rolled, heat treated, pickled or de-scaled
Strip	hot or cold rolled, heat treated, pickled or de-scaled
Pipe	seamless, longitudinally welded, heat treated, pickled or de-scaled
Bar	rolled or forged, heat treated, pickled or de-scaled
Wire	rolled or drawn, heat treated, pickled or de-scaled
Forging	heat treated, machined on request
Welding filler metal	welding bar, wire electrode coated bar electrode

Do you require other delivery forms or finishes? We will be glad to discuss your needs with you over the phone.

Processing Instructions

Alloy 201 is cold and hot formable. At degrees of cold forming greater than 5%, subsequent stress-relief annealing or annealing is required. Hot forming is performed in the temperature range between 1250 and 800 °C. All work pieces should be freed of oil, grease, carbon, sulfur-containing residues and other contaminants prior to heating. The furnace should be adjusted to maintain a slightly reducing to neutral atmosphere. If the absence of sulfur cannot be guaranteed, slightly oxidizing annealing is necessary. Measures should be taken to avoid alternating between oxidizing and reducing conditions.

Heat Treatment

Annealing: 700 – 850 °C
Stress-relief annealing: 550 – 650 °C
Duration depending on thickness of semi-finished product.
Cooling: Air

Welding

Welding on alloy 201 is preferably carried out on matching materials using GTAW and GMAW gas metal arc welding processes as well as the fusion arc welding process. The semi-finished products should be processed in a stress-free, metallic bright condition and be free of dirt.

Chemical Composition*

	C	Si	Mn	S	Cu
Max.	0.02	0.25	0.35	0.005	0.25
	Fe	**Mg**	**Ti**	**Ni****	**-**
Min.	-	-	-	99.0	-
Max.	0.40	0.15	0.10	-	-

* weight %

** permissible Co max. 1%

Physical Properties

	Material 201
Melting temperature range	1450–1445 [°C]
Density*	8900 [kg · m^{-3}]
Modulus of elasticity* (approximately)	196 [GPa]
Specific heat*	440 [J · kg^{-1} · K^{-1}]
Thermal conductivity*	76 [W · m^{-1} · K^{-1}]
Coefficient of thermal expansion 20-300 °C	14.5 x 10^{-6} [K^{-1}]
Specific electrical resistivity*	0.085 [Ω · mm^2 · m^{-1}]

* at room temperature

Mechanical Properties at Room Temperature

Semi-finished product form	Sheet ≤ 50 mm thickness Bar ≤ 250 mm ⌀ Forging ≤ 150 mm ⌀ thickness
$R_{p\ 0.2}$ min [MPa]	80
$R_{p\ 1.0}$ min [MPa]	105
R_m [MPa]	340-540
A min [%]	40

Mechanical Properties at Elevated Temperatures*

Semi-finished product form	Strength parameter	Temperature °C 100	200	300	400
Sheet ≤ 50 mm thickness	$R_{p\ 0.2}$ [MPa]	70	65	60	55
Bar ≤ 250 mm ⌀	$R_{p\ 1.0}$ [MPa]	95	90	85	80
Forging ≤ 150 mm thickness	R_m [MPa]	290	275	260	240

* minimum values

Welding Filler Metal

	DIN EN ISO	Alloy Designation
Bar (GTAW)	18274	Ni 2061
Wire (GMAW)	18274	Ni 2061
Coated rod electrode (MMA)	14172	Ni 2061

We will be glad to provide you with information and instructions on machining and processing and on the selection of suitable welding filler metal. Please do not hesitate to call us.

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