

SPECIFICATIONS

Commercial 200 Series

200 Series stainless steels are not new – In fact they have been around for many years. To date they have traditionally not proved very popular outside the USA. However, since they have a much lower Nickel content than 300 Series Austenitics, the very high Nickel price over recent years has led to significantly more interest. Equally, stainless steel producers have an ongoing programme of development designed to enhance existing grades and produce new grades. These new grades are sometimes developed for specific end uses and sometimes to improve upon an existing grade.

Features:

- ~ Lower nickel than 300 series – with it being replaced by Manganese
- ~ Thus lower cost than 300 series
- ~ Similar mechanical & physical properties to 300 series
- ~ Similar fabrication performance to 300 series, including deep-drawing
- ~ Corrosion resistance similar to 430 (i.e. not nearly as good as 300 series)
- ~ High carbon may cause stress corrosion cracking, especially after welding thicker material
- ~ Non Magnetic

Performance Comparison:

- ~ Formability: Similar to 304, better than 430
- ~ Strength: Stronger than 304 (and 430)
- ~ Corrosion Resistance @20 C: Similar to 304, better than 430 but susceptible to stress corrosion cracking / intergranular corrosion especially after welding

CHEMICAL COMPOSITION

| Element | % Present |
|----------------|-----------|
| Chromium (Cr) | 16 - 18 |
| Manganese (Mn) | 6.8 - 8.5 |
| Nickel (Ni) | 2 - 5 |
| Nitrogen (N) | 0.25 max |
| Iron (Fe) | Balance |

See attached page for full chemical analysis and mechanical properties

ALLOY DESIGNATIONS

AISI 201 stainless steel corresponds to the following specifications:
UNS20100 / EN1.4372 / JIS SUS 201

AISI 201L stainless steel corresponds to the following specifications:
UNS20103 / EN1.4371

AISI 202 stainless steel corresponds to the following specifications:
UNS20200 / EN1.4373

AISI 204C stainless steel corresponds to the following specifications:
UNS20400 / EN1.4597

SUPPLIED FORMS

- Sheet
- Plate

GENERIC PHYSICAL PROPERTIES

| Property | Value |
|-----------------------|-------------------------|
| Density | 7.80 g/cm ³ |
| Thermal Expansion | 17 x10 ⁻⁶ /K |
| Modulus of Elasticity | 200 GPa |
| Thermal Conductivity | 15 W/m.K |

MECHANICAL PROPERTIES

| Property | Value |
|-------------------|-------------|
| Proof Stress | 310 Min MPa |
| Tensile Strength | 655 Min MPa |
| Elongation A50 mm | 40 min % |

See attached page for full mechanical properties.

Note that there are some differences in the requirements of AISI 200 series types and the EN standards - The above is taken from AISI. EN 1.4372, the EN equivalent to AISI 201 has a minimum proof of 350 and a tensile range of 750 to 950 whilst minimum elongation is 45%

WELDABILITY

Reasonable, although sensitive to intergranular corrosion in the heat affected zone where thickness exceeds 6mm.

Post-weld cleaning and passivation is crucial.

CORROSION RESISTANCE

The 200 series grades perform at a similar level to grades 304 and 301 in low corrosion, mainly indoor applications at room temperature.

Not recommended for use in Chloride environments.

HEAT RESISTANCE

Oxidation resistance is similar to grade 1.4310 (301) up to 840 Centigrade.

APPLICATIONS

200 series austenitics are typically used to replace types 304 and 301 as well as Carbon (Chrome-Manganese) Steels mainly for indoor use for low corrosion applications at room temperature

Furniture
Bins
Cookware & Serving Bowls
Window Channel Spacers
Safety Shoes (mid-sole protector)
Deep drawn kitchen equipment – e.g. Cookware & Sinks
Hose Clamps
Trailer Frames
Industrial Strapping
Railway Rolling Stock

There is also grade 201LN for welded constructions, structural uses and low temperature applications - Examples include sides & roofs of trains, liquified gas storage vessels, structural members/chassis of railway rolling stock, trucks & trailers, coal handling equipment

PERFORMANCE COMPARISON

The 200 series grades perform at a similar level to grades 304 and 301 in low corrosion, mainly indoor applications at room temperature.

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REVISION HISTORY

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DISCLAIMER

This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

Please note that the 'Datasheet Update' date shown above is no guarantee of accuracy or whether the datasheet is up to date.

The information provided in this datasheet has been drawn from various recognised sources, including EN Standards, recognised industry references (printed & online) and manufacturers' data. No guarantee is given that the information is from the latest issue of those sources or about the accuracy of those sources.

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Typical Chemical Composition

| % | 201/201L | 202 | 204C |
|--------------|-----------|----------|------|
| C Max | 0.15/0.03 | 0.15 | 0.15 |
| Cr | 17 | 18 | 16 |
| Mn | 6 | 8.5 | 7 |
| Ni | 4.5 | 5 | 2 |
| N | 0.25 Max | 0.25 Max | 0.15 |

Mechanical Properties

| Grade | 201 | 201L | 201LN | 202 | 204C |
|-------------------------|--------|--------|--------|-----|------|
| Tensile Strength (KSi) | 75 Min | 95 Min | 95 Min | | |
| Proof Stress 0.2% (KSi) | 38 Min | 38 Min | 45 Min | | |
| Elongation % (Min) | 40 Min | 40 Min | 40 Min | | |

Extract from BS EN 10088-2: Chemical Compositions

| Designation | Chemical composition % by mass max unless stated | | | | | | | | | | |
|-------------|--|-------|------|----------|-------|-------|-----------|-----------|------|---------|--|
| | EN | C | Si | Mn | P | S | N | Cr | Mo | Ni | Others |
| 201 | 1.4372 | 0.15 | 1.00 | 5.5/7.5 | 0.045 | 0.015 | 0.05/0.25 | 16.0/18.0 | - | 3.5/5.5 | - |
| 201L | 1.4371 | 0.030 | 1.00 | 6.0/8.0 | 0.045 | 0.015 | 0.15/0.20 | 16.0/17.0 | - | 3.5/5.5 | - |
| 202 | 1.4373 | 0.15 | 1.00 | 7.5/10.5 | 0.045 | 0.015 | 0.05/0.25 | 17.0/19.0 | - | 4.0/6.0 | - |
| 204C | 1.4597 | 0.10 | 2.00 | 6.5/8.5 | 0.040 | 0.030 | 0.15/0.30 | 16.0/18.0 | 1.00 | 2.00 | B: 0.0005/ 0.0050 Cu: 2.00/ 3.5 |

Extract from BS EN 10088-2: Mechanical Properties

| Steel name | Steel number | Product | | Proof strength | | Tensile strength R_m N/mm ² | Elongation % |
|-------------|--------------|---------|---------------------|---------------------------------|---------------------------------|---|--------------|
| | | Form | Max thickness mm | $R_{p0.2}$ N/mm ² | $R_{p1.0}$ N/mm ² | | |
| 201 | 1.4372 | C | 8 | 350 | 380 | 750/950 | 45 |
| | | H | 13.5 | 330 | 370 | 750/950 | 45 |
| | | P | 75 | 330 | 370 | 750/950 | 40 |
| 201L | 1.4371 | C | 8 | 300 | 330 | 650/850 | 45 |
| | | H | 13.5 | 280 | 320 | 650/850 | 45 |
| | | P | 75 | 280 | 320 | 630/830 | 35 |
| 202 | 1.4373 | C | 8 | 340 | 370 | 680/880 | 45 |
| | | H | 13.5 | 320 | 360 | 680/880 | 45 |
| | | P | 75 | 320 | 360 | 600/800 | 35 |
| 204C | 1.4597 | C | 8 | 300 | 330 | 580/780 | 40 |
| | | H | 13.5 | 300 | 330 | 580/780 | 40 |