

MARYLAND METRICS

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TECHNICAL INFORMATION and DATA

Austenitic steel group

Chromium-nickel steels which are made resistant to corrosion by the self-generated chromium oxide. If the chromium oxide film is damaged, it will restore itself as long as there is oxygen in the environment. However, if access of oxygen is hampered by unfavorable designs or contamination, corrosion will occur.

All austenitic stainless steel fasteners are normally non-magnetic; after cold working some magnetic properties may be evident particularly for A2. When there is a risk of inter-granular corrosion, steel grades A3 and A5 (=stabilized steels) or A2L and A4L (=low carbon steel) are recommended.

Common stainless grades are:

- **A2-70 / A4-80** for bolts, screws, studs and nuts
- **A1-50** for machined pins, slotted set screws, specials

- A1:** Steel type, e.g.: **1.4305** 1.4300
Chromium-nickel-steels specially designed for machining. Due to the elevated content of sulphur, the steels within this grade have lower resistance to corrosion than corresponding steels with normal content of sulphur. Weldability is possible but not good.
- A2:** Steel type, e.g.: **1.4301** 1.4303 1.4306** (= A2L) 1.4311 (= A2L)
Chromium-nickel steels most frequently used (**stainless steel**). They are suitable for kitchen equipments and apparatus for the chemical industry. Steels within this grade are not suitable for use in non-oxidizing acid and agents with chloride content, i. e. swimming pools and sea water. Good weldability.
- A3:** Steel type, e.g.: **1.4541** 1.4550
Stabilized "stainless steels" with properties similar to A2.
- A4:** Steel type, e.g.: **1.4401** 1.4435** (= A4L) 1.4436 1.4406** (= A4L) 1.4429** (= A4L)
Acid proof steel. Chromium-nickel steels which are molybdenum alloyed and give a considerably better resistance to corrosion than A1, A2 and A3.
A4 is used to a great extent by the cellulose industry as this steel grade is developed for boiling sulfuric acid (thus given the name "acid proof") and is to a certain extent also suitable in an environment with chloride content. A4 is also frequently used by the food processing industry and by the marine industry. Good weldability.
- A5:** Steel type, e.g.: **1.4571** 1.4580
Stabilized "acid proof steels" with properties similar to A4.

Other types: Steel type e.g.: 1.4439 1.4539 1.4529 1.4565 1.4426
Austenitic stainless steels with particular resistance to chloride induced stress corrosion. The risk of failure of bolts, screws and studs due to chloride induced stress corrosion (for example in indoor swimming pools) can be reduced by using these types of steels.

** = Excellent resistance to inter-granular corrosion

Martensitic steel group

Steels with somewhat limited resistance to corrosion, but which can be heat treated to excellent strength. Magnetic.

- C1:** Steel type, e.g.: **1.4006** 1.4021 1.4028
Steels used in turbines, pumps and knives.
- C3:** Steel type, e.g.: **1.4057**
Resistance to corrosion better than C1. Used in pumps, valves and apparatus.
- C4:** Steel type, e.g.: (**1.4104** most commonly used)
Steels intended for machining, otherwise they are similar to steels of grade C1.