

Why Special Alloys?

While 316L is adequate for most applications, high chloride media, acidic pH levels, high temperature, time of contact, and equipment design can affect the corrosion of stainless steel.



The NEUMO Ehrenberg Group offers a wide range of special alloys: 316L; 1.4435; 904L; AL-6XN®; Ultra 6XN; Hastelloy® C22®; Alloy C22.

These alloys are commonly used in the biotech, pharmaceutical, personal care, home care, food, dairy, and beverage industries worldwide.

The Value of proper material selection

Increase Production

Decrease downtime and product loss

No Microbial Contamination

No crevice and pitting corrosion, no product buildup

No Maintenance Cost

Eliminate regular replacement and repair of failed material

One-time Material Investment

Proper material compatibility equals to a long running equipment

Stainless Steel and Corrosion

The uniqueness behind the corrosion resistance of stainless steel is the formation of a durable and spontaneous ultra-thin film that covers the surface.

The resistance of this film is dependent on the steel grade chosen and the conditions to which it is exposed. If the conditions become aggressive, the oxide film breaks down resulting in corrosion.

The main types of corrosion affecting hygienic and high purity application in aggressive chloride environments are pitting, crevice, and stress corrosion.

Optimum performance is obtained by the use of alloying elements; chromium, molybdenum, nickel, and nitrogen.



Types of Alloys and PREN

In today's market there are a wide range of austenitic, superaustenitic, duplex, superduplex, and nickel-base alloys. Besides corrosion performance, other factors should be considered such as commercial availability, appearance, good mechanical properties, and fabrication characteristics.

The higher the PREN-value (Pitting Resistance Equivalent Number), the more resistant the alloy is to localized pitting corrosion by aqueous salt solution.

	UNS		EN Designation	C	N	Cr	Ni	Mo	Cu	PREN
Austenitic	S31603	316L	1.4404	0.03	0.1	16.0-18.0	10.0-14.0	2.0-3.0		24
Duplex	S32205	2205	1.4462	0.03	0.14-0.20	22.0-23.0	4.5-6.5	3.0-3.5		35
Superaustenitic	N08904	904L	1.4539	0.02	-	19.0-23.0	23.9-28.0	4.0-5.0	1.0-2.0	36
Superduplex	S32750	2507	1.441	0.03	0.24-0.32	24.0-26.0	6.0-8.0	3.0-5.0	0.5	42.5
Superaustenitic	S31254	254SMO	1.4547	0.02	0.18-0.22	19.5-20.5	17.5-18.5	6.0-6.5	0.5-1.0	42.5
Superaustenitic	N08926	Ultra 6XN	1.4529	0.02	0.15-0.25	19.0-21.0	24.0-26.0	6.0-7.0	0.5-1.5	45
Superaustenitic	N08367	AL-6XN®		0.03	0.18-0.25	20.0-22.0	23.5-25.5	6.0-7.0	0.75	45.2
Nickel base	N10276	C276®/Alloy C276	2.4819	0.01	-	16	57	16	0.5	
Nickel base	N06022	C22®/Alloy 22	2.4602	0.01	-	22	56	13	0.5	

For stainless steel: $PREN = \%Cr + 3.3 \times \%Mo + 16 \times \%N$

Typical Applications

Some of the common applications for the special alloys; 904L, 6Mo and Alloy C22 in the

hygienic, biotech and pharmaceutical industries.

- **Biotech and Pharmaceutical:** buffer solutions, chromatography lines, API, ethanol distillation, saline solutions
- **Personal care:** shampoo, conditioner, toothpaste, deodorant/antiperspirant, body wash, liquid soap
- **Home care:** fabric softener, detergent, cleaners
- **Food, dairy and beverage:** ketchup, tomato sauce, mayonnaise, soy sauce, barbecue sauce, chili sauce, breaker eggs/liquid eggs, soup, brine solutions, cheese, isotonic drinks



Product range

Superaustenitic

The superaustenitic also known as high-performance stainless steel share many characteristics with its standard grade counterpart like high tensile strength, good weldability, and formability becoming a better choice than duplex stainless steel. Additionally, it is a cost-effective alternative to more expensive nickel-base alloys.

✓ Standard: ASME-BPE

MaxCore 904L - UNS N08904

- Sizes: 1/2" - 4" O.D. tube size
- Internal Surface Finish: SF3 - 0,76 µm (30Ra) & SF4 - 0,38µm (15Ra) EP
- Tube complies with ASTM A249/A269/B674 and ASME SB674



MaxCore 6Mo - UNS N08367

(AL-6XN®; Ultra 6XN)

- Sizes: 1/2" - 4" O.D. tube size
- Internal Surface Finish: SF1- 0,51µm (20Ra) & SF5 - 0,51µm (20Ra) EP
- Tube complies with ASTM A270/A269/A249/B676 and ASME SA249/SB676

- ✓ Standard: DIN11866/ DIN 11865 range B

MaxCore 904L - UNS N08904

- Sizes: DN8 (13,5) – DN100 (114,3)
- Internal Surface Finish: H3o (internal Ra < 0,8µm) and H4o (internal Ra < 0,4µm)
- Tube complies with PED, EN10217-7/EN10216-5

Nickel-based alloy

HASTELLOY Alloy C-22®/ Alloy C22 is a nickel-chromium-molybdenum alloy with enhanced resistance to corrosion. The alloy provides exceptional resistance to pitting and crevice corrosion attacks in chloride-induced media as well as stress corrosion cracking.

- ✓ Standard: ASME-BPE

MaxCore Alloy C22 - UNS N06022

- Sizes: 1/2" - 4" O.D. tube size
- Internal Surface Finish: SF1 - 0,51µm (20Ra) & SF5 - 0,51µm (20Ra) EP
- Tube complies with ASTM B626/B622 and ASME SB626/SB622

- Complete product range includes MTR according EN 10204-3.1

Other equipment under the NEUMO Ehrenberg Group



- ✓ ConnectS® * BioConnect® * BioControl®
- ✓ Tank ferrules, custom fittings and manifolds
- ✓ BioFlow check valves



- ✓ Single seat valves
- ✓ Mixproof valves
- ✓ Sampling valves
- ✓ Relief valves



- ✓ AWH-Connect
- ✓ Butterfly valves
- ✓ Magnetic mixers
- ✓ Tank cleaners