

Special Interest Articles:

• Duplex Stainless

Page 2: Stainless
and Nickel Price
trends.

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Duplex Stainless Steel

This month, I would like to discuss Duplex Stainless Steel (DSS) as one of the answers to Stress Corrosion Cracking (SCC).

DSS means those steel with a mixed microstructure of about equal proportions of Austenite and Ferrite. DSS were first produced as "wrought" steel in Sweden in 1930 for use in the Sulfite Paper Industry.

Starting in the 60's the refining techniques in electric arc furnaces were improved and the carbon contents were lowered to better control heat chemistries and to reduce impurity levels. However, the major progress in the metallurgy of duplex stainless steel took place in the 1970's with the introduction of 2205 as the first generally accepted grade. It still accounts for over 70% of present duplex Deliveries.

The most popular brands are:

2101-Lean Duplex.

(C 0.04%; Cr 21-22%; MO 0.1-0.8%; MN 4-6%, and NI 1.37-1.7%). This is a less expensive brand of DSS and is used primarily for tank and structural applications.

2304-Lean Duplex.

(C 0.020 %; CR 23%; NI 4.0%; MO 0.2%.) This is a good

alternative to 316L stainless steel.

2205 Duplex.

As I mentioned, this is the most popular DSS. (C 0.020 %; Cr 22.1%; Ni 5.6%; Mo 3.1%) . 2205 is used in chemical processing, oil and gas exploration, marine and other chloride environments, along with pulp and paper digesters and liquor tank fabrication.

2507Cu Duplex.

(C 0.030%; Cr 24-26% ; MO 3.0-4.0%; Ni 5.5-8.0%, and CU 0.5-2.0%). 2507 is used to resist warm sea water and other high chloride environments. The Cu adds resistance to Sulfuric and other reducing acids, particularly in the very aggressive "mid concentration" range.

All the DSS have a higher tensile strength than 304 and 316 SS service, allowing designers to use thinner materials for vessel designs. DDS have better pitting and crevice corrosion than 304 and 316, usually a better thermal shock resistance, and naturally better resistance to Stress Corrosion Cracking.

Before you automatically replace an existing SS vessel, you might consider exploring the attributes of Duplex Stainless Steel.

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NON FERROUS SURCHARGE CHART

Stainless prices are up (↑) for September deliveries. Nickel prices are (↓) for September and October and then slightly rise (↑) for November deliveries. Remember, this chart is for surcharge only, it does not include the base price for materials.

Alloy	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2205	0.7523	0.7574	0.7215	0.5632	0.5622	0.6308	0	0	0
304 CLAD	0.3534	0.3347	0.3205	0.2666	0.2726	0.3	0	0	0
304/304L	0.6016	0.5687	0.5403	0.4325	0.4446	0.4948	0	0	0
304H	0.6016	0.5687	0.5403	0.4325	0.4446	0.4948	0	0	0
304LN	0.6016	0.5687	0.5403	0.4325	0.4446	0.4948	0	0	0
304N	0.6016	0.5687	0.5403	0.4325	0.4446	0.4948	0	0	0
309/309S/309H	0.7841	0.7366	0.694	0.5587	0.5767	0.6502	0	0	0
310/310S	1.0369	0.964	0.8965	0.7395	0.7681	0.8823	0	0	0
316/316L	0.7608	0.739	0.6921	0.5689	0.5777	0.6627	0	0	0
316LN	0.7608	0.739	0.6921	0.5689	0.5777	0.6627	0	0	0
316Ti	0.7833	0.7597	0.7109	0.5844	0.594	0.6819	0	0	0
317/317L	0.8799	0.8639	0.8075	0.661	0.6683	0.7703	0	0	0
AL-6XN Plus	1.4162	1.3372	1.4477	1.449	1.3939	1.2735	1.0564	1.1345	0
alloy 20	1.6467	1.4871	1.6107	1.5444	1.4468	1.3372	1.1699	1.2744	0
AL-200 TM	3.1192	2.5648	2.907	2.6976	2.3947	2.1176	1.9971	2.294	0
AI-400 TM	2.3123	1.9708	2.2196	2.0685	1.8568	1.6642	1.6041	1.8355	0
AI-600 Tm	2.6038	2.2021	2.4507	2.2798	2.0593	1.8577	1.6881	1.904	0
Altemp 625 In	4.344	4.0843	4.3166	4.2492	4.1002	3.8758	3.5821	3.7601	0
Alloy 276	3.5832	3.3826	3.6396	3.6576	3.5368	3.261	2.9147	3.0924	0



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