



PREVENTING CORROSION IN CONCRETE STRUCTURES & INDUSTRIAL APPLICATIONS



*Durinox Stainless Steel Reinforcing Bar
Product Summary Guide*

Company Profile & Introduction

Stainless Bar & Wire Co. is a fully owned Australian company that leads the way in supplying concreting products to the building and construction industry. With an established distribution and warehousing network throughout Queensland, we offer a product range to rival all competitors, including a dedicated stainless steel reinforcing division.

Durinox is Stainless Bar & Wire Co.'s trade name for stainless steel reinforcing and is synonymous with durability and longevity. Other methods may delay the onset of concrete cancer (spalling) however only Durinox Stainless Steel Reinforcing will prevent it. It is no coincidence that we lead our market, and it's this experience and expertise that stands behind the Durinox product range.

Stainless Bar & Wire Co. knows that steel and concrete are the backbone of most constructions. Our Durinox team is working with asset owners, designers, engineers and builders of structures to ensure appropriate grades are selected and the intelligent positioning of the stainless occurs. This will effectively save our customers money in the initial cost, as well as saving them money by virtually eliminating maintenance costs for up to 100 years!

Our dedicated stainless processing equipment can cut to size and bend to almost any shape that is required for your project. At Stainless Bar & Wire Co., we understand that by keeping our equipment dedicated to processing only stainless steel, any risk of cross contamination from conventional black steel is avoided. This is paramount in keeping your investment in stainless steel, corrosion free for its total design life.

"BUILD FOR TODAY WITH TOMORROW IN MIND"



The pictures above are examples of corrosion in carbon steel reinforcing caused by an aggressive marine environment.

Reasons for Specifying Durinox Stainless Steel Reinforcing Bar

- Concrete is a “sponge”. Stainless steel reinforcing bar provides a solution to problems associated with chloride induced corrosion in reinforced concrete structures, particularly in aggressive environments, such as sea water, where early deterioration of carbon steel is a serious problem.
- Stainless steels are easy to handle, manipulate and weld and can withstand damage and abrasion during installation when compared with galvanized and coated steels.
- The use of stainless steel rebar will outlast galvanized steel rebar by more than 5 times in a variety of corrosive environments.
- Stainless steel can be recycled after many years of service meaning less environmental impact.
- The enhanced performance of stainless steel will reduce the maintenance and repair costs of a comparable carbon steel reinforced structure. The cost of repeat inspections, traffic interruption for engineering work and perhaps demolition is virtually eliminated.
- Stainless steel is a cost effective option in structures that have difficult future access for repair or maintenance.
- Stainless steel’s mechanical strength and corrosion resistance may allow a reduction in the thickness of concrete, which can considerably lighten the weight of a structure. It also equates to cheaper transport costs for prefabricated items.
- The higher mechanical properties of some grades of stainless over carbon steel may enable the use of reduced metal sections.
- Stainless is forgiving in installation; it can be flush with the concrete surface without subsequent corrosion risk. Therefore concrete pouring methods, curing, coatings, on site inspection and special concrete blends may be able to be relaxed.
- Stainless steel reinforcing should be used in the critical corrosion zones only. If designed correctly, there are no subsequent risk of galvanic corrosion of rebar, when buried in concrete away from the recognized corrosion zones. Joining between stainless and carbon steel can be achieved with couplers or lapping.
- The durability of stainless steel is attractive to asset owners who often look at the “triple bottom line” (environment, social and financial) when assessing the overall life-cycle cost of a structure.
- Austenitic stainless steels have low magnetic permeability and are suited to applications where disturbing strong magnetic fields need to be avoided such as housings for electronic equipment, transformer bases, medical buildings and airports.
- Austenitic stainless steel retains ductility to temperatures below -196°C making it suitable for reinforcement of containment systems for LNG and Liquid Oxygen.
- Stainless steel has low thermal conductivity and high strength at elevated temperatures giving it superior fire and heat resistance qualities compared to standard mild steel.



Specify Durinox Stainless Steel Rebar

Typical Applications

Buildings:

Balcony nosing; Sea facing frontages; Abattoir floors; Prefabricated concrete structures; Monumental restoration; Fire resisting walls; Buildings requiring non-magnetic reinforcing such as hospitals, banks, airports and meteorological stations.

Civil engineering:

Bridges; Tunnels; Wharfs; Piers; Dams; Sea Walls; Cliff anchor bars; Embankments; Footpaths; Drains; Effluent treatment plants; Structures or civil works required to withstand extreme cold; Seismic resistant constructions; Airport runways; Harbour installations;

Welding

Durinox stainless steel reinforcing bar, both austenitic and duplex types are readily welded. All standard electric welding processes can be used, including friction, flash butt, resistance, MIG (flux cored or solid wire) and manual metal arc welding.

Durinox Reinforcing Bar Stocking Program, Dimensions and Weights:

Nominal Dia. (mm)	CrossSection Area (mm ²)	Mass (kg/m)
6	28.3	0.226
8	50.3	0.425
10	78.5	0.632
12	113.1	0.910
16	201.1	1.618
20	314.2	2.528
25	490.9	3.870
32	804.2	6.471
40	1256.6	10.100

Red = coil stock (no scrap produced)

Black = bar stock usually 11.7m lengths

316 grade (Austenitic) - 6/8/10/12/16mm
2304 grade (Duplex) - 12/16/20/25/32/40mm
2205 grade (Duplex) - 20/25/32/40mm
LDX2101® grade (Duplex) – newly stocked grade.
Call for more info.

Other sizes in different grades can be ordered especially for your project however are subject to minimum order quantities and longer lead times.

**LDX2101 is a trademark of Outokumpu*



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Reinforcing Bar Grade Selection

Stainless Grade Compositions:

Durinox Grade	European Designation	Type	C % max.	Cr %	Ni %	Mo %	N %	PRE*
304	1.4301	Austenitic	0.08	18	8.5			18
316	1.4436	Austenitic	0.08	17	10.5	2.6		24
LDX2101®	1.4162	Duplex	0.03	21.5	1.5	0.3	0.22	26
2304	1.4362	Duplex	0.03	23	4	0.3		24
2205	1.4462	Duplex	0.03	22	5	3	0.15	34

Note: Compositions are typical values except where noted. * PRE = % Cr + (3.3X % Mo) + (16x % N)

Physical and Mechanical Properties:

Measurement	Unit	Austenitic	Duplex
Density	kg/m3	7900	7800
Elastic Modulus	MPa	200,000	200,000
Thermal Conductivity	W/m°C at 20°C	15.3	15
Thermal Expansion coefficient (between 20°C & 200°C)	10 ⁻⁶ cm/cm/°C	16.5	13.5

Note: These values are typical. Each individual grade has properties that can vary slightly from these values.

Minimum Yield Strength

Durinox Grade	European Designation	Minimum Yield Strength(MPa)	
		Cold Ribbed	Hot Ribbed
304	1.4301	500	235
316	1.4436	500	235
LDX2101®	1.4162	530	450
2205	1.4462	650	600
2304	1.4362	650	600

Red text = Durinox stock range

* LDX2101 is a trade mark of Outokumpu



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Durinox Products & Services

Durinox Stainless Reinforcement Range of Products and Services:

Stainless Steel Products:

- Cold Ribbed Rebar – 3mm to 16mm
- Hot Ribbed Rebar – 20mm to 50mm
- Connection Couplers
- Welded Wire Mesh
- Tie Wire
- Dowels

Durinox Customised Processing Equipment:

- Durinox processing equipment is the only dedicated stainless steel reinforcing bar bending and forming equipment in Australia and New Zealand
- Cold ribbed product up to 16mm diameter is processed from stainless steel coil into customized bar shapes and lengths
- Hot ribbed product from 20 to 50mm diameter is processed from standard 11.7m bar lengths into customized shapes and lengths

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