

# LDX2101<sup>®</sup> Stainless Steel

**What is LDX2101<sup>®</sup>?** LDX2101<sup>®</sup> is a Duplex Stainless Steel (as distinct from Austenitic, Ferritic or Martensitic). Duplex Steels generally combine the properties of the Austenitic and the Ferritic stainless steels. The duplex stainless steels are typically more corrosion resistant than the Austenitic range, and have a substantially higher yield stress.

LDX2101<sup>®</sup> is a trade name for EN 1.4162 Stainless Steel, registered to Outokumpu Steel Ltd. LDX2101<sup>®</sup> is ferromagnetic, which is useful for many applications, and has over double the yield strength of grade 304 stainless steel. Apart from its high strength and grain structure, LDX2101<sup>®</sup> contains substantially less nickel than 304, but much higher Chromium and Nitrogen content. This enables LDX2101<sup>®</sup> to retain high corrosion resistance without suffering the price fluctuation associated with volatile Nickel prices.

For engineering calculations and comparison, listed opposite are the properties of LDX2101<sup>®</sup>, SS370, austenitic grades 304 & 316, and structural steel S275 (typically used for galvanised lintels).

## Forming LDX2101<sup>®</sup>

All our cold formed products are either roll-formed or brake-pressed. LDX2101<sup>®</sup> is readily formable, experiencing some work-hardening. Under the guidelines in BS 5950-5, (reference design standard for light & medium gauge cold formed sections) an increased yield strength value may be used in the vicinity of bends. We usually do not take advantage of the increased yield values as many products undergo subsequent treatment that may negate the benefit of cold working.

## Cutting & Machining LDX2101<sup>®</sup>

LDX2101<sup>®</sup> can be cut on site using stainless steel (aluminium oxide) abrasive discs. Avoid using discs that have been in contact with other metals, such as mild steel, to help minimise contamination that may reduce the corrosion resistant properties LDX2101<sup>®</sup>. For sawing processes the use of a suitable lubricant is recommended but not essential. Good quality high speed steel drills are suitable for use on LDX2101<sup>®</sup>. Slower speeds than for mild steel should be used and the drill bits kept sharp. High speeds or blunt drill bits can cause excessive heat and work hardening which will then make drilling very difficult. Use of cutting lubricant is recommended to minimise heat. Punching

and shearing of LDX2101<sup>®</sup> is readily achieved with the same tooling that would be used for mild steel, but increased force is often required and maximum punching/shearing thicknesses are typically reduced. (This applies to nibbling equipment as well). Oxy-Acetylene cutting of stainless steels is very difficult due to the high melting point of chrome oxide, and is not recommended; plasma-arc cutting, sawing or abrasive disc are the preferred methods for cutting stainless. Best of all, if you cut or drill an LDX2101<sup>®</sup> product on site, you don't need to worry about damaged surface protection, because it's corrosion resistant stainless steel, all the way through!

## Welding LDX2101<sup>®</sup>

LDX2101<sup>®</sup> May be readily welded using similar processes to the other stainless steels; LDX2101<sup>®</sup> rod or wire, or Duplex filler types 2209 or 2507 are recommended. High heat input is recommended to assist proper grain formation in the HAZ. Excessively slow cooling is to be avoided, but is not usually relevant to our products because they all cool rapidly on account of the light gauge material. Do not use filler wire/rod designed for welding Austenitic Stainless Steel, the Chromium and Nickel content is wrong, and will result in a weak weld of lesser corrosion resistance. For on site welding of dissimilar metals (e.g. mild steel) to LDX2101<sup>®</sup> the previously listed electrodes should be used so as not to diminish the strength or corrosion resistance of the stainless. Note that other steels so joined may experience rapid corrosion unless in a clean & dry installation.

## Coating LDX2101<sup>®</sup>

LDX2101<sup>®</sup> corrosion resistance exceeds that of austenitic grade 304 stainless steel, and in some situations even exceeds grade 316. In almost all applications coating for surface protection is unnecessary. In some particularly harsh environments coating with a suitable paint system may be of benefit, in these cases LDX2101<sup>®</sup> exhibits exceptional under-paint corrosion resistance to prevent corrosion spread in case of coating damage. In cases where painting is required for aesthetic reasons, the material must be thoroughly cleaned and painted with an etch primer designed for stainless steels prior to over coating. LDX2101<sup>®</sup> may also be powder coated. Because of its ferromagnetic nature, particles of mild steel and other contaminants from the manufacturing and construction processes

are often left on the surface of an LDX2101<sup>®</sup> product. These particles (especially mild steel) will rust and cause localised stains, however these are easily removed by cleaning, and once installed and cleaned the products typically retain their finish better than a 304 stainless steel product. (note that the same particles cause similar staining on 304 steel, although they are not attracted to the surface so readily during manufacturing and construction).

## Notes for Stainless Steel Grades SS370, 304 & 316

We can also manufacture in stainless steel grades SS370, 304 and 316. For products in 304 and 316 see our separate RED Galvanised Catalogue; SS370 is our designation for the corrosion resistant ferritic grade of stainless steel with EN specification 1.4003. This steel has lower corrosion resistance than grade 304, but is substantially better than a galvanised product at a similar price! The other advantage of SS370 is its high strength (see properties opposite). All safe working loads published in this catalogue hold for both LDX2101<sup>®</sup> and SS370. 316 stainless steel (or 316L) is an exceptionally corrosion resistant Austenitic stainless steel. It is typically specified for applications requiring corrosion resistance in aggressive environments such as marine projects. It is very expensive compared to the other two stainless steels we offer, and has lower usable strength. We only recommend specifying 316 for our products in marine or similar environments and where aesthetics are of prime concern. 304 stainless steel (or 304L) is a general purpose austenitic stainless steel. It will retain a shiny finish for many years in most residential and commercial building applications and would typically outlast the rest of the building several times over. This steel is unfortunately also relatively low strength compared to LDX2101<sup>®</sup> or SS370. 304 derives its corrosion resistance primarily from its high nickel & chromium content. Nickel is an extremely price volatile material, and consequently the price of 304 stainless steel is historically similarly unstable. We suggest specifying our products in grade 304 only when they are to be installed together with other 304 fittings. We recommend choosing LDX2101<sup>®</sup> over grade 304 stainless steel; at time of print it is less expensive, is more than twice as strong, and has better corrosion resistance. Although originally developed as a high strength steel, LDX2101<sup>®</sup> is now displacing 304 stainless steel in most lintel applications for these reasons.