



THE WORLD'S STRONGEST  
STAINLESS STEEL BOLTS

# BUMAX DX 129

## BUMAX® DX 129- High Strength Duplex Stainless Eqv. to 12.9

Manufactured in Sweden, BUMAX meets the requirements of high demanding customers when it comes to quality, corrosion resistance, high strength, fatigue strength, traceability and heat resistance. All products are European traceable, fully tested and available with optional 3.1 product test certification. We deliver reliability and safety. Visit the BUMAX website for further information, technical data, CAD files, customer cases and see why BUMAX products are trusted by the most demanding industries around the world.



### Product Features

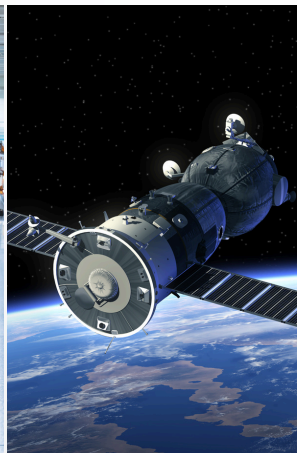
Very High Mechanical Strength ✓

High Ductility ✓

Excellent Fatigue Resistance ✓

High Corrosion Resistance ✓

No Risk of Internal Hydrogen Embrittlement ✓



## BUMAX DX 129 Application Areas

BUMAX® DX 129 is designed for very high strength bolting applications where corrosion can also be a concern.

Traditionally, for these types of high strength application engineers would have to opt for high tensile 12.9 carbon steel fasteners. However, these fasteners lack any sort of resistance to corrosive conditions and would therefore also require an additional protective coating. This can introduce a host of complications- more complex specifications, supply chain sourcing challenges, additional quality concerns and product performance risks.

In addition, a secondary coating will not offer the same level of robustness and protection of a stainless material. 12.9 carbon steels also suffer from reduced ductility and fatigue resistance.

There is also another common concern with high tensile carbon steel fasteners- risk of Hydrogen Embrittlement and unexpected failure during service, if the fasteners have not been correctly manufactured.

BUMAX DX 129 does not suffer such risk and is not susceptible to internal hydrogen embrittlement, as a result of its manufacturing process.

The next alternative to high tensile 12.9 coated carbon steel fasteners, would be a sizeable step up in specification towards nickel alloy fasteners, such as Alloy 625, 718, A286, K500 in order to achieve high strength and high corrosion resistance (or even Titanium in certain applications). These types of high specification fasteners are almost always custom manufactured, at high cost and long lead times. Such options can be an even more costly, as volume requirements increase due to the manufacturing process involved.

BUMAX DX 129 has been designed to bridge the gap between coated high tensile 12.9 carbon steel fasteners and far more costly high specification Nickel alloy material grades.

BUMAX DX 129 delivers an optimal combination of mechanical performance, corrosion performance, availability and cost in many applications.

## Mechanical Properties

BUMAX® DX 129 fasteners are equivalent in strength to carbon steel 12.9 and minimum tensile and yield strengths are guaranteed, regardless of the fastener diameter up to maximum M20. Despite very high strengths, there is no compromise in ductility of DX 129 fasteners, which exhibit excellent ductility, similar to that of A4-80 fasteners. This means that DX 129 fasteners also benefit from superior fatigue resistance properties and is an ideal option for highly demanding applications, where connections are subject high levels of dynamic mechanical loading.

The added mechanical strength offered by BUMAX DX 129 can be utilised to downsize fastener diameters for smaller, more compact and efficient designs. Alternatively, BUMAX DX 129 can be designed in retrospectively, for added capacity against increased loads or to provide additional margins of safety and reassurance.

BUMAX DX 129 offers design engineers unique capabilities, where traditional high tensile 12.9 coated carbon steel fasteners are unable to cope due to lack of ductility, risk of hydrogen embrittlement or corrosion. DX 129 is also proven to be a more cost-effective option, where higher grades of Nickel alloy fasteners are proving to be expensive, especially in applications where higher volumes are required.

PRODUCT GRADE	TENSILE STRENGTH (min.)	YIELD STRENGTH (min.)
BUMAX DX 129	1,200 MPa / 174 ksi	1,080 MPa / 156 ksi
12.9 Carbon Steel	1,220 MPa / 176 ksi	1,100 MPa / 159 ksi
Alloy 718 (AMS 5662/5663)	1,275 MPa / 185 ksi	1,000 MPa / 145 ksi
Alloy K500 (ASTM F468)	896 MPa / 130 ksi	620 MPa / 90 ksi
A286/Grade 660 (ASTM A453- Class A)	895 MPa / 130 ksi	585 MPa / 85 ksi
Titanium- Grade 5 (ASTM F468)	896 MPa / 130 ksi	861 MPa / 125 ksi

## Corrosion Resistance

BUMAX® DX 129 is manufactured from premium duplex stainless steel material. Duplex stainless-steel offers very high resistance to chlorides and are therefore a very good option in seawater environments.

BUMAX DX 129 benefits from a PREN considerably higher than that of A4/316L materials, giving a better corrosion performance alternative to standard A4/316 fasteners in coastal and offshore environments. However, despite its excellent corrosion resistance properties, BUMAX DX 129 is often used for its strength, mechanical properties and immunity to internal hydrogen embrittlement from its manufacturing process.



### Customer Case- Ringfeder (Germany)

Ringfeder Power Transmission has used a range of BUMAX® high-strength corrosion-resistant stainless steel fasteners since 2012, as they are able to transmit the high torques from the company's rust-proof locking devices.

BUMAX® DX 129 screws are used for some of its products and proves to be the ultimate choice where very high strength, ductility and corrosion resistance are required.

“BUMAX was the only company that could provide the high-strength fasteners with the corrosion resistance we required for our applications.” - Rainer Peter, Senior Product Manager for Shaft-Hub Connections at Ringfeder Power Transmission.

## Quality, Traceability & Certification

All BUMAX® fasteners are fully traceable, with 100% of all material and manufacture exclusively within Western Europe. All BUMAX production undergoes full testing in accordance with ISO 3506 and every product is available with optional 3.1 test certification. Products are traceable down to individual box labels (material cast and production number) and can be cross referenced against the 3.1 certificates.



### Stock

BUMAX® DX 129 fasteners are stocked in hex bolts, hex set screws, socket head cap screws, nuts, and washers in sizes from M6 to M16 as standard. Other fastener types can be manufactured to order in sizes up to M20. See the BUMAX website for the full range.