



### BUMAX® 88- reliability and consistency, where you need it most

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.

### Features vs A4-80 / B8M Class II



Premium A4/316L Material



High Strength



Fatigue Resistance



Good Corrosion Resistance



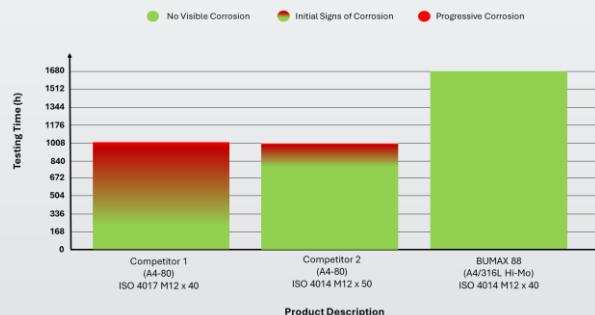
Low Risk of Galling- easy assembly



Low Magnetic Permeability

As a result, BUMAX 88 offers much better corrosion resistance compared with more commonly available A4-80 stainless steel or B8M Class II, due to its higher molybdenum content, lower carbon content, smooth surface properties and BUMAX's rigid control of trace elements and inclusions.

Visual Inspection of Samples During Salt Spray Testing  
(Testing to ISO 9227- 5% NaCl- 35°C)



### Corrosion Resistance

BUMAX® 88 is manufactured from premium 316L high Molybdenum grades, with much higher alloying composition than standard A4-80 (ISO 3506-1) or B8M Class II (ASTM A193) fastener material grades.

The Pitting Resistance Equivalent Number (PREN) is a well-known formula that indicates the pitting resistance and crevice corrosion resistance, based on the material's alloying content. The higher PRE number, the more resistant is the steel against pitting corrosion in seawater and chloride induced corrosion.

Grade	Cr	Mo	Ni	PRE
A4/316 Class 80	17	2.3	10-15	25
ASTM A193 B8M Class II	17	2.3	10-14	25
<b>BUMAX 88 (A4/316L Hi Mo)</b>	<b>17</b>	<b>2.7</b>	<b>min. 11</b>	<b>27</b>

### Mechanical Properties

BUMAX® 88 fasteners are stronger than class A4-80 and equivalent in strength to carbon steel 8.8. The minimum mechanical properties of BUMAX 88 are also guaranteed regardless of fastener diameter, unlike B8M Class II fasteners, where the strength differs depending on fastener diameter and can become considerably weaker at larger diameters.

BUMAX 88 offers good ductility, providing additional safety and security against unexpected failure. This also means that BUMAX 88 benefits from fatigue resistance.

BUMAX 88 also retains its excellent material properties down to cryogenic temperatures, with negligible loss in toughness. This is backed up by a 3<sup>rd</sup> party assessment demonstrating BUMAX 88's suitability for pressure equipment designed in accordance with PED 2014/68/EU, down to operating temperatures as low as -273°C.

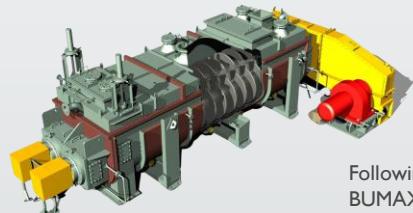
Grade	Dimension	Tensile Strength (min.)	Yield Strength (min.)
<b>BUMAX 88 (A4/316L Hi Mo)</b>	<b>M3-M36</b>	<b>800 MPa / 116 ksi</b>	<b>640 MPa / 93 ksi</b>
A4/316 Class 80 (A4-80)	M3-M36	800 MPa / 116 ksi	600 MPa / 87 ksi
ASTM A193 B8M Class II	< $\frac{3}{4}$ "	760 MPa / 110 ksi	655 MPa / 95 ksi
ASTM A193 B8M Class II	$\frac{3}{4}$ " – 1"	690 MPa / 100 ksi	551 MPa / 80 ksi
ASTM A193 B8M Class II	1" – 1 $\frac{1}{4}$ "	655 MPa / 95 ksi	448 MPa / 65 ksi
ASTM A193 B8M Class II	1 $\frac{1}{4}$ " – 1 $\frac{1}{2}$ "	620 MPa / 90 ksi	345 MPa / 50 ksi

## Applications

- Marine Applications
- Subsea Equipment
- Transportation
- Industrial Machinery
- Space
- Process & Pipework Installations
- Pressure Equipment (PED 2014/68/EU)
- Low Temperature & Cryogenic Applications
- Structural Bolting (Non-preloaded & Preloaded)



## Customer Case- Nara Machinery (Japan)



The machines require a high degree of air tightness with firmly tightened stainless steel screws. However, as screws that have powder contact cannot be lubricated, they are particularly susceptible to thread galling issues. Such issues and maintenance needs resulted in costly procedures and downtime for industrial customers.

Following this successful trial, NARA Machinery has recently built a brand-new machine with BUMAX® 88 screws. "Going forward, we plan to use BUMAX® screws for all new powder-handling machines we manufacture that require air tightness," says Johara. "This will help our customers avoid the need for costly downtime due to the maintenance and replacement needs related to galling."

The use of BUMAX® 88 screws has helped NARA Manufacturing to further develop their high-quality powder-handling machines. "We are very happy to have found BUMAX, and I would strongly recommend BUMAX products to other companies that experience similar galling issues," concludes Johara.

## 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.I test certification. Products are traceable down to individual box labels (material cast and production number) and can be cross referenced against the 3.I certificates.



## Stock



BUMAX 88 fasteners are stocked in hex bolts, hex set screws, socket head cap screws, counter-sunk screws, threaded bars, nuts, lock-nuts and washers in sizes from M3 to M36 and 1/4" to 1" UNC. Other sizes and types manufactured to order. See the BUMAX website for the full range.