

**ACCIAIERIE VALBRUNA**

High quality is our standard

**av225eVO**

THE R-EVOLUTION IN DUPLEX STEEL MACHINABILITY

**When turning becomes  
easy even for a steel  
tough to be machined**

**Valbruna has developed a new generation of improved machinability stainless steels that also includes duplex steel.**

AV225EVO has a different behavior when compared to the standard grades of similar alloy composition, due to a special steel making process aimed at generating special inclusions.

#### Description of the material

AV225EVO is a molybdenum and nitrogen alloy ferritic-austenitic stainless steel whose duplex structure, containing approximately the same amounts of ferrite and austenite, is able to provide both good pitting and uniform corrosion resistance, as well as very good stress corrosion cracking resistance, along with high mechanical properties and toughness.

#### Applications

Pump and valve parts, pressure vessels, desalination plants, tanks, bolts, nuts, rings, stirrers, hollow bars handling solutions containing chloride, marine environments, boat shafts where corrosion fatigue resistance is required.

#### Corrosion resistance

AV225EVO has a very good resistance in environments containing chloride and fluoride and other aggressive solutions or materials. Particularly, it shows better results in general and pitting corrosion than type 316 and similar austenitic stainless steels, and has a very good resistance to crevice corrosion, thanks to high chromium, nitrogen and molybdenum contents. However, in any case, an accurate evaluation of component design is required in order to avoid very narrow crevices situations. Stress corrosion resistance is guaranteed thanks to the presence of the ferritic part of the duplex structure. It's important to point out that the surface of every kind of stainless steel for optimum corrosion resistance should be passivated and free of any contaminants, heat tint and scale.

#### Designations

| STANDARD<br>VALBRUNA GRADE | IMPROVED MACHINABILITY<br>VALBRUNA GRADE | AISI    | W.N.   | UNS           | EN              |
|----------------------------|------------------------------------------|---------|--------|---------------|-----------------|
| V225MN                     | AV225EVO                                 | F51/F60 | 1.4462 | S31803/S32205 | X2CRNIMON22-5-3 |

#### Specifications

| ASME                  | ASTM               | EN                        |
|-----------------------|--------------------|---------------------------|
| SA182 / SA276 / SA479 | A182 / A276 / A479 | 10088-3 / 10222-5 / 10272 |



## Machining

Standard duplex grades have, by definition, a poor machinability due to their chemical composition that, considering their application, privileges other characteristics such as high mechanical properties and excellent corrosion resistance. Nevertheless, in recent years, the usage of duplex has become more popular also in markets other than Oil and Gas, where parts need to be subjected to high precision machining processes. As a consequence, the request for good machinability has now become more frequent.

AV225EVO has been developed starting from the MAXIVAL EVO® steel making practice where the aim is a tailored and precise control of non-metallic inclusions with a particular morphology and lubricating properties which are able to improve machinability.

This results in lower tool wear and higher chip-breaking due to the formation of a layer between the tool and the chip.

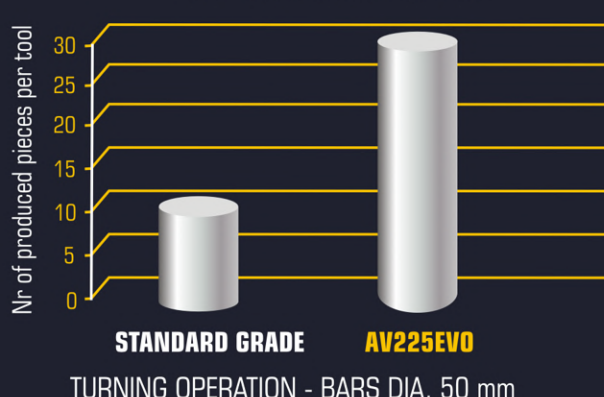
Available size range: 5,5 - 65 mm.

**The enhanced cutting speed with EVO vs Standard Grade**



This simple bar graph highlights that AV225EVO allows to significantly increase the cutting speed during a turning operation improving the equipment performance.

**The enhanced productivity with EVO vs Standard Grade**



The improvement of equipment performance achieves an increase of overall productivity as shown in this second graph.



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