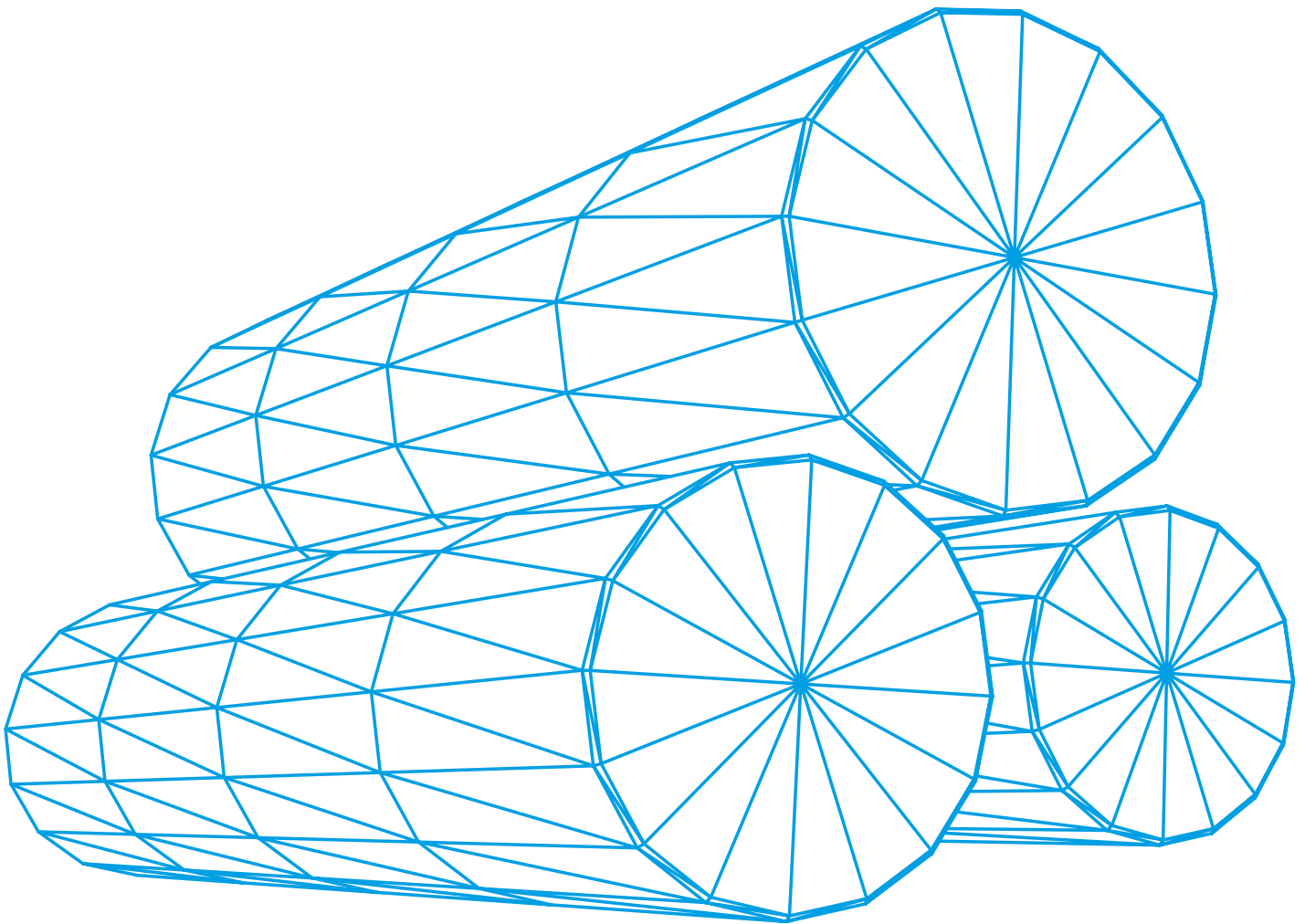




# FAST-TRACK SOURCING WITH PRE-CERTIFIED BAR

NEW FULLY CERTIFIED SANDVIK SAF™ 2205+ DUPLEX BAR FOR SUBSEA VALVE AND PUMP COMPONENTS



# TESTED. APPROVED. IN STOCK. NEW SANDVIK SAF™ 2205+ DUPLEX BAR.

You know the scenario. A major oil and gas company places an urgent order for a critical subsea pump or valve component to be machined from 2205 duplex bar (UNS: S31803, S32205). In addition to meeting common oil and gas standards, you now face additional testing requirements to certify the material for aggressive conditions. Relax. Instead of waiting weeks to comply with the new tests, you can use Sandvik SAF™ 2205+ bar, which is pre-tested, optimized and ready to go for the most critical subsea applications.

We call it "Plus" because this new member of our Sandvik SAF™ 2205 bar family is optimized to withstand extreme corrosion and certified for the very latest subsea requirements. Such requirements are, of course, an industry response to certain highly publicized pump and valve malfunctions in recent years – often due to hard-to-detect pitting corrosion or other types of general corrosion.

Sandvik SAF™ 2205+ complements our Sanmac® 2205 bar, which is renowned for its machining advantages. Featuring reduced levels of sulfur and phosphorous, with even tighter chemical tolerances, Sandvik SAF™ 2205+ bar is fully certified for critical subsea applications.

## KEY BENEFITS

- Covers the main end-user specifications
- Fast-tracks your material sourcing
- Aligned to the new IOGP S-563 and ISO 17781 standards
- No need for additional testing or certification
- Excellent resistance to general corrosion, cracking and pitting
- Outstanding surface finish
- Good weldability
- Minimum 4:1 reduction ratio on all dimensions

## MEETING STRINGENT OIL & GAS STANDARDS

Having served the oil and gas industry for more than 60 years, we are always looking for ways to innovate, improve safety and boost productivity. This applies to the development of corrosion-resistant alloys as well as new materials that are easier to fabricate, machine and weld. Sanmac® 2205 bar, for example, is our machinability-optimized version of the duplex (austenitic-ferritic) Sandvik SAF™ 2205. While Sanmac® 2205 bar significantly reduces machining time and costs, Sandvik SAF™ 2205+ is better suited to the most aggressive subsea environments due to its lower phosphorus and sulfur content.

## STANDARDS MET

- IOGP S-563
- ISO 17781
- NORSOK M630 Ed 6
- NACE MR0175/0130
- API 6A

## DUPLEX BAR WITH A PLUS

Sandvik SAF™ 2205+ duplex bar has all the benefits of a duplex steel along with the latest certification required for demanding oil and gas components. As a high-strength duplex duplex steel, it's ideal for pumps, valve heads, rings, actuators and other key control mechanisms in lighter constructions. And with extended testing and tighter chemical composition, you have a corrosion-resistant stainless-steel material that meets the most demanding applications.



### FAST TRACK YOUR SOURCING

If you are an distributor or machine shop, you may not have stocks of 2205 in the 20 to 260 mm range that are all fully certified to the latest standards. Sourcing the right material can take weeks and could mean you need to conduct additional tests to gain material certificates. Now you can stop worrying about all that. With Sandvik SAF™ 2205+ on your shelf, you have a bar that's ready to go – certified and approved for the most demanding subsea applications.

### EXTENDED TESTING AND TIGHTENED ACCEPTANCE CRITERIA

As the pioneers of modern duplex materials, with more than 50 years' experience from duplex manufacturing, we know that the standard testing and manufacturing procedures will not meet the increased demands of high performing materials for subsea applications. The design of Sandvik SAF™ 2205+, is based on extensive discussions with major oil and gas companies. The result is a grade that not only fulfills the new standards, but also covers other important requirements in end user specifications.

### ADDITIONAL TESTING

- Measuring of austenite spacing for material sizes from 50 mm and above, according to DNV RP F112, to verify the fine-grained structure.
- Extended hardness test close to surface.
- Ultrasonic testing according to ASTM, EN and API 6A standards

In addition to a 3.1 certificate, we provide microscopic images, test results from all additional tests and full documentation of heat treatment and ultrasonic testing. Should further testing be required, our test lab is certified to ISO/IEC 17025 and equipped for more than 600 test methods. If needed, we can also help put you in touch with a third-party inspector. All our bars are PMI-tested and ink-marked for full traceability.

### CONSISTENT QUALITY

An integrated steelmaker with a heritage dating back to 1862, Sandvik is noted for its top-quality products and ability control the entire production chain – from melt to finished product. This means you can count on consistent quality from batch to batch, with full traceability. Should you have technical questions, our service teams in the oil and gas hubs – supported by a dedicated R&D team – are always happy to help. We have extensive experience from demanding oil and gas applications with some of the world's leading oil and gas companies. When it comes subsea pumps, valves and components for critical applications, our knowledge gives you peace of mind when sourcing material, allows for shorter lead times and ensures an efficient process from the first point of contact to delivered materials.

## Chemical composition (nominal) %

### SANMAC® 2205 BAR

C	Si	Mn	P	S	Cr	Ni	Mo	N
≤0.030	≤1.0	≤2.0	≤0.030	≤0.015	22.5	4.5	3.2	0.17

### SANDVIK SAF™ 2205+

C	Si	Mn	P	S	Cr	Ni	Mo	N
≤0.030	≤1.0	≤2.0	<0.020	<0.010	22.5	4.5	3.2	0.17

The table above shows chemical composition of Sanmac 2205 bar and Sandvik SAF™ 2205+. Note the reduced levels of phosphorus and sulfur to comply with the most stringent oil and gas end-user requirements.

## Delivery testing

MATERIAL STANDARDS AND TESTS PERFORMED ON SANDVIK SAF™ 2205+	DELIVERY STATUS
Standards: IOGP S-563, ISO 17781	√
Standards: NORSOK M630, M650 ASTM 479, NACE, etc.	√
Chemical composition: P<0.020 S<0.010	√
PRE > 35	√
Impact test ¼ T, at -50 C°	√
Impact test criteria per ISO 17781 QLII longitudinal: 65J average 50J single	√
Impact test criteria per IOGP S-563, transversal 45J average 35J single	√
Hardness test ¼ T	√
Hardness test near surface	√
Tensile test ¼ T	√
UT testing per ASTM A388/API 6A PSL 3 for all dimensions above 75 mm	√
Pitting corrosion (G48) from a cross section, from the surface to the center	√
Ferrite check near surface per ASTM E562	√
Ferrite check at half radius per ASTM E562	√
Ferrite check at center per ASTM E562	√
Microscopic pictures per ASTM A923 Method A, near surface, mid radius and in the center of the bar	√
Heat treatment test diagram provided for all dimensions	√
Ultrasonic test diagram provided for all dimensions above 75 mm	√
Austenite spacing reported per DNV RP F112	√
100% PMI testing	√

## HOW TO ORDER

The most common dimensions of stainless bar in Sandvik SAF™ 2205+ are stocked and ready to ship. For less common dimensions, your order will be manufactured and shipped within 8–12 weeks. To order, please contact your nearest Sandvik partner for additional information.



**CONTACT US**

Sandvik Materials Technology  
materials.sandvik

