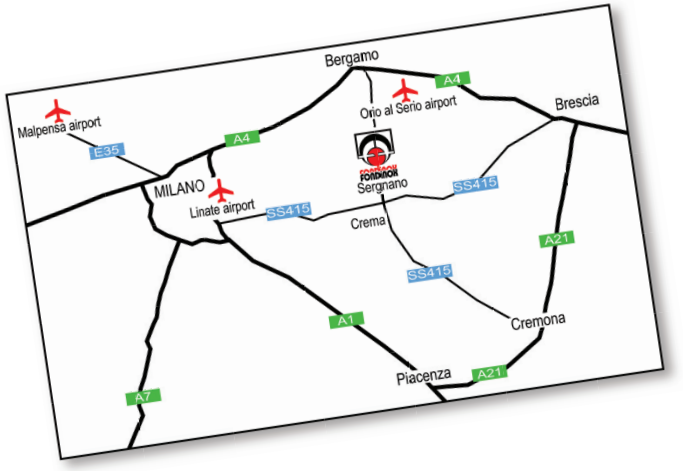
PRODUCTION RANGE

FONDINOX is a typical job foundry, specialized in the production of static castings in stainless alloys, from 13% Cr martensitic grades up to all corrosion resistant Ni base alloys. In SANDVIK SAF 2205 castings ranging from 0.5 Kg up to 6000 Kgs single finished weight can be produced. Centrispun tubes with OD up to 1500 mm, length up to 5.5 mts, thickness up to 150 mm are also produced. Vertically shaped centricast products are also produced, with max OD up to 1400 mm and max length up to 880 mm.
Both such products can be considered for many applications in the valve and pump industries as the ideal substitutes for static castings, owing to their outstanding metallurgical cleanliness. The utilization of various high frequency induction furnaces, also with small capacities, confers to this special alloy production an high flexibility degree, with absolutely no problems of minimum melting quantities and consequent delayed deliveries to cutomers. Castings are produced under written procedures, determined by internal quality assurance department and not destructive controls are performed by qualified personnel. Technical and production engineers are at continous full disposition of customers for consulting work and project development.

Fully machined decanter cylinder (1000 mm OD)



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Stainless steel and nickel base alloys

SANDVIK SAF 2205

CASTINGS FOR OFFSHORE,
CHEMICAL AND PETROCHEMICAL
INDUSTRIES

www.fondinox.com

SANDVIK SAF 2205 (UNS J92205\ASTM A890 GR 4A), produced by foundry FONDINOX under official agreement and technical assistance of SANDVIK STEEL AB Sweden, can be considered one of the basic developments in the production of duplex cast alloys. This alloy gives an answer to many of the most demanding environments encountered in offshore and chemical technologies. Its main advantages are:

- high resistance to stress corrosion cracking in chloride or hydrogen sulphide bearing media;
- high resistance to general, pitting and crevice corrosion;
- high mechanical strength, roughly twice the yield strength of the austenitic grades;
- good resistance to erosion corrosion and corrosion fatigue;
- good weldability.

Finish machined pump casing (3000 Kgs)

CHEMICAL COMPOSITION (TYPICAL FOR CASTINGS)			
C	0.022	Cr	22.50
Si	0.45	Ni	5.50
Mn	0.9	Mo	3.10
P	0.020	N	0.17
S	0.005	P.R.E.	≥34

MECHANICAL PROPERTIES AT 20°C			
		Min. (castings)	Min. (wrought)
0.2% Yield stress	MPa	450	450
1% Yield stress	MPa	470	500
Tensile strength	MPa	680	680
Elongation	%	20	25
Hardness	HV	<270	<305
Hardness (typical)	HV	220	220
Impact value KV 20°C	J/cm^2	150	200
Impact value -45°C	J/cm^2	110	120

PHYSICAL PROPERTIES AT 20°C		
Modulus of elasticity	190	GPa
Thermal conductivity	19	W/m°C
Specific heat capacity	400	J/Kg°C
Density	7.8	Kg/dm^3
Electrical resistivity	0.80	μΩm
Melting temperature (liquidus)	1445	°C
Patternmaker's shrinkage	2.5	%

CORROSION RESISTANCE

Corrosion resistance of duplex cast alloys is determined by several factors, among which the phase balance austenite\ ferrite assumes a decisive role. The best results are obtained at a ratio 55:45, which can be reached only through a careful control of chemical composition and solution treatment. In these conditions the cast alloy shows an high degree of refractoriness against all forms of localized attack (pitting, crevice, stress corrosion) also in the most demanding environments encountered in sour gas wells. Rotating components (centrifugal impellers) can then take advantage by the optimum resistance of SAF 2205 against erosion corrosion and cavitation.Corrosion resistance of well produced castings can be assumed roughly equivalent to that of wrought or forged products. Fondinox is qualified acc. to Norsok M-650 for production of static castings with thicknesses up to 250 mm. Similar qualification is available also for all types of centricast items.

WELDABILITY

SAF 2205 castings are readily weldable. The cast base structure must be presented to the welding operations in a complete solution treated condition, to avoid the coexistence of embrittling sigma phase. Low heat input should be used, to avoid either intermetallic precipitation or ferritization in the heat affected zone, with an interpass temperature not exceeding 150 °C. It will be recommended to utilize for any welding operation as filler metals in gas-shielded arc welding SANDVIK grade 22.8.3.L. and for manual arc welding the covered electrode SANDVIK 22.9.3.L.

MACHINABILITY

Compared with the standard cast grade A351 CF8M (AISI 316) cutting speeds have to be reduced by 20% when machining SAF 2205 with cemented carbide tools. Much the same applies to other operations, where cemented carbide tools are used. If high speed steel tools are used, the same cutting data can be applied, as with AISI 316.