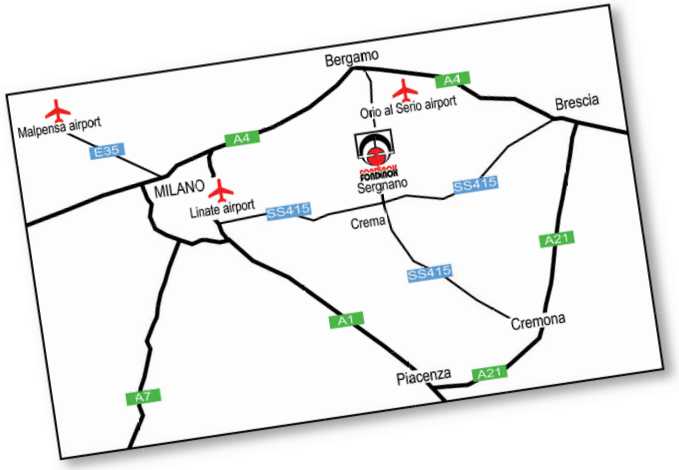
PRODUCTION RANGE

Fondinox SpA is a job foundry, specialized in the production of cast products in stainless alloys, ranging from mariensitic 13%Cr grades up to all corrosion resistant nickel base alloys. In Avesta Outokumpu Oy 654SMO 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.
Centricast products can be considered for many applications in the valve and pump industries the ideal substitutes either of sand castings or forgings, due to their outstanding metallurgical cleanliness. The utilization of various high frequency induction furnaces, also with small capacities, confers to this special alloy production the highest flexibility, with no problems of minimum melting quantities.
Our technical and metallurgical department is at continuous full disposition of Customers for consulting and project development.
All production steps are executed according to a QA System ISO 9002 qualification (Lloyd's Register accreditation No. 160085).

Centricast balls for oil & gas applications



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Stainless steel and nickel base alloys

AVESTA 654 SMO

CAST PRODUCTS FOR INDUSTRIAL APPLICATION

www.fondinox.com

Fondinox SpA produces under original licence of AVESTA OUTOKUMPU Oy raw, premachined and finish machined castings and centricast products in the patented alloy 654SMO (UNS S32654), worldwide known as one of the superaustenitic stainless cornpositions with the best corrosion resistance in rnany environrnents, cornrnonly encountered in:

- oil and gas sour wells
- process equipment in chemical industry
- bleaching equipment in pulp and paper industry
- flue gas cleaning
- desalination
- seawater handling

Main properties of 654SMO alloy are:

- fully austenitic structure
- very good resistance to uniforrn corrosion
- exceptional good resistance to pitting and crevice
- very good resistance to various types of SCC
- good ductility and weldability
- enhanced mechanical properties

Machined choke valves (350 Kgs)

CHEMICAL COMPOSITION (TYPICAL FOR CASTINGS)			
C	0.020	S	0.010
N	0.45	Cr	24.0
Si	0.50	Ni	22.0
Mn	3.5	Mo	7.3
P	0.020	Cu	0.7

MECHANICAL PROPERTIES AT 20°C (TYPICAL)					
		Min. (castings)	Typical (castings)	Min. (wrought)	Typical 254 SMO (castings)
0.2% Yield stress	MPa	370	390	430	290
1% Yield stress	MPa	400	430	470	320
U.T.S.	MPa	700	730	750	580
Elongation	%	30	40	40	45
Hardness	HB	<250	<250	<250	<190
Impact	J/cm^2	70	120	80	180

PHYSICAL PROPERTIES AT 20°C		
Density	8.0	Kg/dm^3
Modulus of elasticity	189	GPa
Linear expansion between 20°C and 100°C	$15x10^{-6}$	$°C^{-1}$
Thermal conductivity	8.6	W/m°C
Thermal capacity	500	J/Kg°C
Electical resistivity	0.78	µΩm
Patternmaker's shrinkage	2.4	%

CORROSION RESISTANCE

Corrosion resistance of Avesta Outokumpu Oy 654SMO alloy is generally considered on the top of all stainless cast alloys. Outstanding pitting and crevice corrosion performances can be reached. Cast products are generally considered slightly lower in such performances than equivalent hot finished products, due to the unavoidable presence in the solidified structure of micro and macro-segregations. Proprietary production cycles and solution treatment practices at very high temperatures (>1230°C) contributes in the optimisation both of segregations and intermetallic precipitates, leading to an outstanding corrosion resistance, fully comparable to wrought items. For more detailed corrosion data it is advisable to consult data sheets and original literature both of Outokumpu Oy and Fondinox SpA.

WELDABILITY

Cast Avesta 654SMO is readily weldable. The overalloyed Ni base filler metal AVESTA POLARIT P16 (similar to Ha-stelloy alloy C22) is recommended. Low heat input should be used, with interpass temperatures not exceeding 150°C. Full solution annealing, followed by rapid water quench is also recommended in case of major welds.

MACHINABILITY

When cast Avesta 654SMO castings are to be machined, the tendency towards work hardening must be considered, as for all superaustenitic grades. With the right choice of tools and machining data, full satisfactory results can be obtained. Literature is available also on such subject.