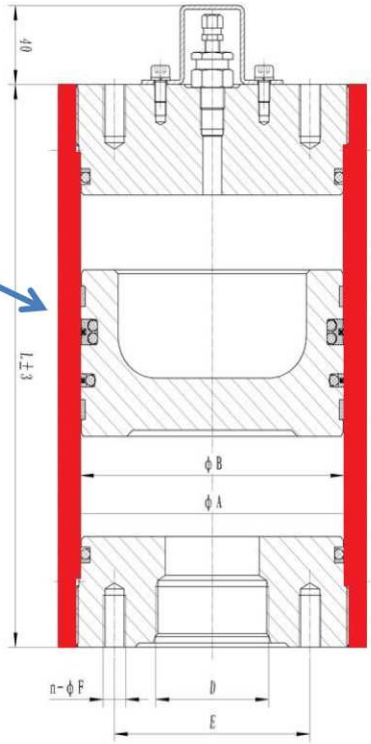
FONDINOX S.p.A.
26010 SERGNANO (CR) Italy - Via Marconi, 42/48
in CZ and SK represented by
BIBUS METALS s.r.o.
Vídeňská 125, 619 00 Brno, T +420 547 125 383, info@bibusmetals.cz,
www.bibusmetals.cz
BIBUS METALS
SUPPORTING YOUR SUCCESS

Pipes for Hydraulic Cylinders and Piston Accumulator Construction

In the last years Hydraulic field is still growing all over the word due to the ability to manage considerable power using components with little size and weight.
In each plant, when is required the conversion of hydraulic energy in mechanical (force or movement), are used Hydraulic Cylinder or Piston Accumulator.
Thanks of continuous improvement of our production processes, enhancing the technological level and the technical content of our products and aiming to the optimization of our results in terms of quality performances, **Fondinox SpA** could identify not only as a supplier but first of all as a reliable and highly qualified partner in the production of **stainless steel and special alloys centrifugal casting pipes** used as barrel for the Cylinder or Accumulator construction.

Pipe/barrel
For Piston
Accumulator



Supply condition of the pipe:

- rough condition: annealed, tempered, solubilized or as requested.
- OD and ID premachined cylindrical.
- finish machined with internal honing.

Fondinox S.p.A. is equipped with an excellent machining department (GM Inox srl) and with a whole series of further qualified machining subsuppliers, in order to perform all types of machining operations inhouse.

CNC Horizontal Lathes for machine long and big pipes

Finish machined Pipe in ASTM A995 Gr4A

Dimensional Range

Outside Diameter	**200 < OD < 1200mm**
Minimum honed Inner Diameter	**ID (honed) > 65mm**
Length of pipe	**L up to 4750mm**

Pipes premachined outside and honed inside in ASTM A451 CPF8M (316)

Rough pipe with thickness of 100mm in ASTM A487 CA6NM

Rough pipes in ASTM 451 CPF8 (304)

Materials

The application fields of Hydraulic Cylinders and Piston Accumulator are very wide: Oil and Gas, Energy, Hydraulic, Static or Motion Mechanical Engineering.

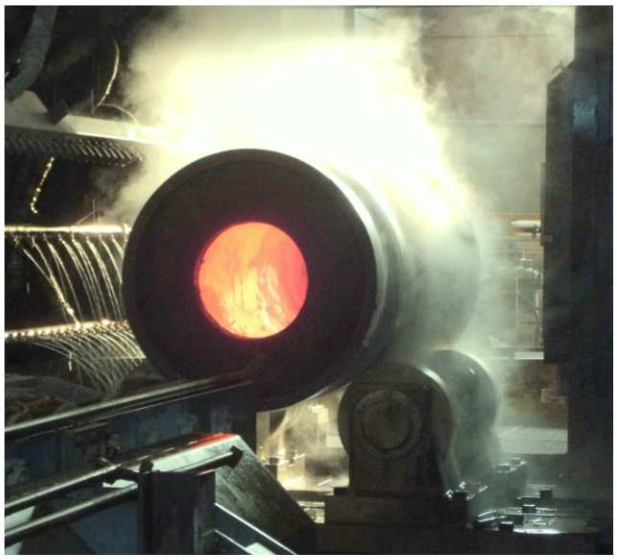
Below you can see a table with typical material and their designation of these components:

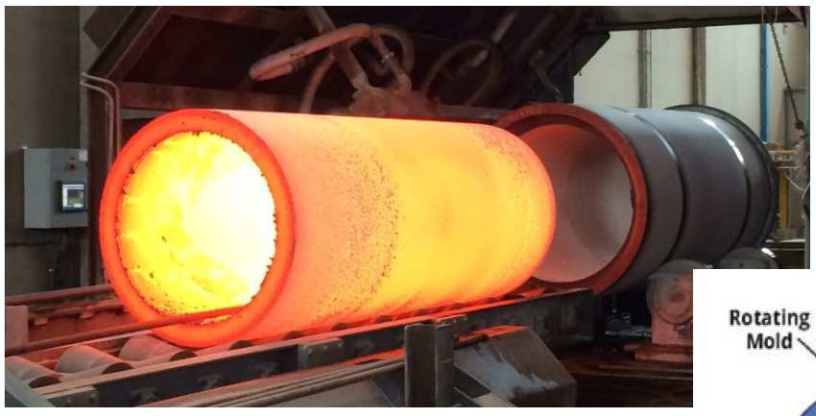
TYPICAL GRADES SUITABLE FOR THIS APPLICATION															
CATEGORY	CROSS REFERENCES						CHEMICAL ANALYSIS (ACC. TO ASTM)					TENSILE PROPERTIES (ACC. TO ASTM)			
Structure	ACI/Cast	Cast ASTM	Cast EN/DIN	Cast UNS	Wrought UNS	Wrought Grade	C	Cr	Ni	Mo	Other	$Rp_{0.2}$[MPa]	Rm [MPa]	A %	Hardness [HB]
Martensitic	CPCA15	A426	1.4008 GX8CrNi13	J91150	S41000	AISI 410	<0.15	11.5-14.0	-	<0.5		450	620	18	<225
Martensitic	CA6NM	A352, A487, A757	1.4313 GX5CrNi134	J91540	S41500	13-4, F6NM	<0.06	11.5-14.0	3.5-4.5	0.4-1.0		550	760-930	15	230-300
Austenitic	CPF3	A451	1.4306 X2CrNi19-11	J92500	S30403	AISI 304L	<0.03	17.0-21.0	8.0-21.0	<0.5		205	485	35	140-200
Austenitic	CPF8	A451	1.4308 GX6CrNi189	J92600	S30400	AISI 304	<0.08	18.0-21.0	8.0-11.0	<0.5		205	485	35	140-200
Austenitic	CPF3M	A451	1.4404/1.4409 X2CrNiMo17-12-2	J92800	S31603	AISI 316L	<0.03	17.0-21.0	9.0-13.0	2.0-3.0		205	485	30	140-200
Austenitic	CPF8M	A451	1.4408 GX6CrNiMo18-10	J92900	S31600	AISI 316	<0.08	18.0-21.0	9.0-12.0	2.0-3.0		205	485	30	140-200
Duplex/Superduplex	SAF 2304®	-	1.4362	S32304	-	SAF 2304	<0.03	21.5-24.5	3.0-5.5	0.05-0.6	0.05-0.2N	400	600-820	25	180-250
Duplex/Superduplex	CD3MN	A890, A995	1.4470 GX2CrNiMoN22-5	J92205	S31803	SAF 2205, F51	<0.03	21.0-23.5	4.5-6.5	2.5-3.5	0.1-0.3N	415	620	25	200-260
Duplex/Superduplex	CE3MN	A890, A995	1.4469 GX2CrNiMoN26-7	J93404	S32750	SAF 2507®, F53	<0.03	24.0-26.0	6.0-8.0	4.0-5.0	0.1-0.3N	515	690	18	200-280
Duplex/Superduplex	CD3MWCuN	A890, A995	-	J93380	S39276	ZERON 100®, F55	<0.03	24.0-26.0	6.5-8.5	3.0-4.0	0.5-1.0Cu, 0.5-1.0W, 0.2-0.3N	450	690	25	220-280

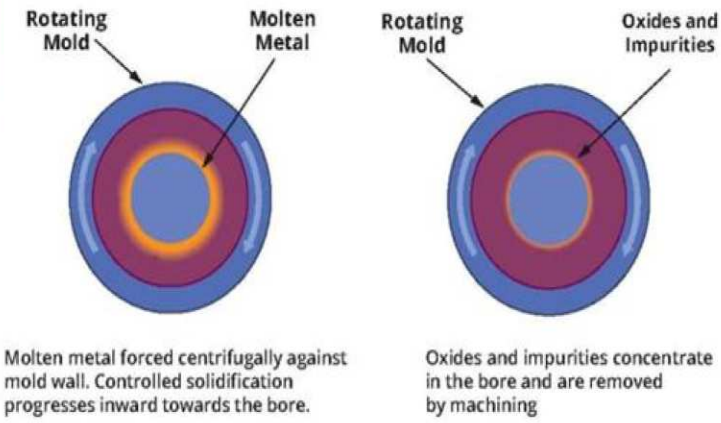
What is Centrifugal Casting?

Process:

Centricast process consists of pouring molten metal into a steel rotating mould. Water cooling of the mould permits a fast solidification from outside to inside surface of the casting.
After the solidification the item is pulled off from the mould and it ready for heat treatment.
Here you can see some picture about the production cycle of a centricast pipe in A451 CPF8 (304).







Why choose centrifugation

Centricast process permits to obtain:

- mechanical separation of non-metallic inclusions: microstructure cleanliness (improvements in performances). They will be eliminated during machining operation.
- high density of the material.
- very short lead time. (rough condition: 2 weeks / premachined: 3-4 weeks).
- all alloys can be produced (acc. to all international Standards).
- optimized mould to reduce weight and costs.
- mechanical properties higher than that of static castings and fully comparable with forgings.