CEMENTING TOOLS

CIRCULATING HEAD WITH CENTRAL VALVE

DESTINATION

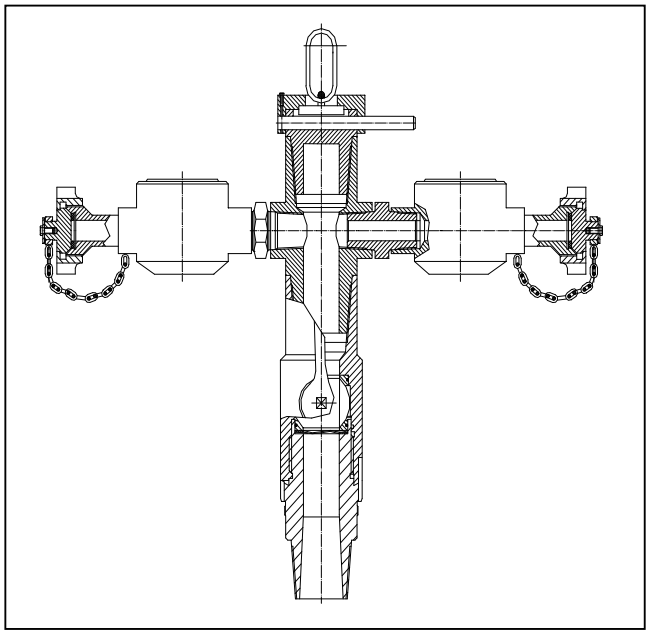
Circulating head with central valve is designed for eruption preventing operations, by closing on the inside of the drilling or production string, in case there is an eruption at the well, allowing the circulation with drilling fluid in order to stop the eruption in the layer.

CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- The upper and lower body of the circulating head is made of AISI 4142 steel, quenched and tempered, thus having a good resistance to mechanical and hydraulically loads inside the drilling or production string.
- Sealing set (seat + ball) which represents the closing element of the valves is made of stainless steel, thus providing operational reliability.
- Sealing set, which is a wear subassembly also interchangeable.
- Connection of the circulating head to the drilling string or tubing string is made by means of threaded joints.
- The construction of the circulating head is simple and solid.

Data to be introduced in the order

1) The dimension of the central valve
2) Connection thread
3) Maximum working pressure



Description	4 ½ IF x 700	3 ½ IF x 700
Nominal diam of central valve	3 1/6 (ϕ78)	2 4.3/64 (ϕ50,8)
Nominal diam of arm valve	2 x 700 bari	2 x 700 bari
Connetion	4 1/2 IF	3 ½ IF
Maximum working load	700 bari	700 bari

CEMENTING TOOLS

STAGE CEMENTING HEAD WITH 4 ARMS

DESTINATION

Stage cementing head, is a surface equipment part of the assembly of stage cementing device which has the following purposes:

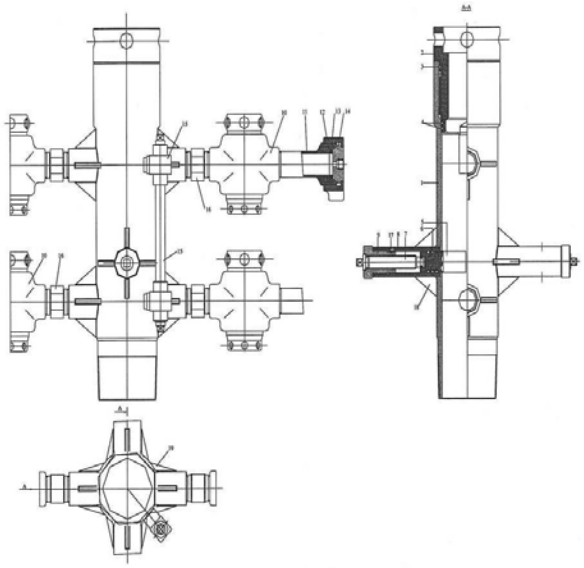
- allows the launching of the cement plugs, without opening the string or stopping the pumping
- transfers the fluids sent from surface under pressure inside the casing string

CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- Stage cementing head has a solid construction having as main part the main body made of alloy steel with chrome and molybdenum quenched and tempered.
- Equalizing pressure assembly has the purpose to equalize the pressure on the cement plug in its rest position.
- Circulating cans mounted on the by-passing assembly have the body made of AISI 4142 steel, quenched and tempered.
- Plug sustaining device is provided with sealing system.

Data to be introduced in the order

1) Nominal dimension
2) Connection thread
3) Maximum working pressure
4) Passing diameter of by-pass



Nominal Dimension		Inside Diameter	Pressure	Weight
in	mm	mm	bar	kg
6 5/8	168,3	144,2	350	261
9 5/8	244,5	220	250	325,3
13 3/8	339,7	313	210	

CEMENTING FLOAT SHOE AND COLLAR

DESTINATION

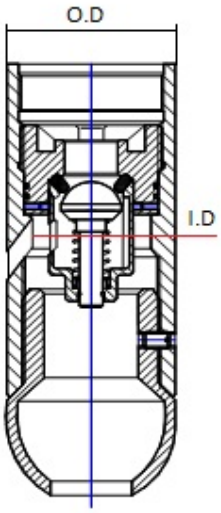
Cementing float shoes and collars are used for casing and cementing the casing strings which are introduced in the well hole.

The cementing float shoes and collars perform the following functions:

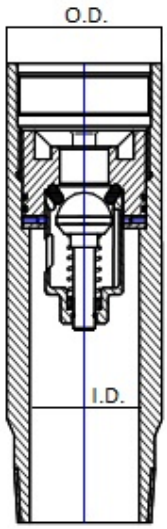
- guiding the casing strings which are introduced in the well hole;
- creating the floating effect of the casing string during the insertion in the well hole having as result the decrease of the traction force at the handling system and the shocks in the upper casing due to the weight of the string;
- cementing the casing strings;
- after pumping the cement milk behind the string, the cementing float shoe and collar does not allow it to enter inside the string after the pressure is discharged.

CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- The cementing float shoes and collars have the bodies made of several types of materials according to the material grade of the casing string in which it is mounted.
- According to the thread connection type the shoes and collars are made in the following solutions:
  - with round short thread, symbol S
  - with round long thread, symbol L
  - with Buttress thread, symbol B
  - with Extreme-Line thread, symbol EL
- All component parts of the shoe and collar mounted inside them are made of easily feasible materials which can be easily removed after the cementing operation.
- Mushroom is the closing element of the shoe and collar and has the role not to allow the circulation the cement mixture from bottom to top.



Float Shoe



Float Collar

Data to be introduced in the order

1) Nominal dimension
2) Connection threads type
3) Connection thread dimension
4) Maximum working pressure

CEMENTING TOOLS

Nominal dimension of shoe & collar		OD Outside Diameter		ID Inside Diameter		Length				Thread symbol	Net weight	
						Collar		Shoe			collar	shoe
mm	in	in	mm	in	mm	in	mm	in	mm	-	kg	kg
114.3	4 1/2	5	127	3 15/16	100	14 39/64	370	12 39/64	320	-round thread short manuf., symbol S; - round thread long manuf., symbol L; - Buttress thread, symbol B;;	17	15
127	5	5 9/16	141.3	4 23/64	110	14 39/64	370	12 39/64	320		21	18
139.7	5 ½	6 1/16	153.6	4 11/16	119	17 23/32	450	14 39/64	370		31	26
168.3	6 5/8	7 25/64	187.7	5 15/16	151	17 23/32	450	14 39/64	370		41	38
177.8	7	7 21/32	194.4	6 11/32	161	17 23/32	450	16 47/64	370		43	46
193.7	7 5/8	8 ½	215.9	6 47/64	171	18 1/2	470	16 47/64	425		62	59
219.1	8 5/8	9 5/8	244.5	7 59/64	201	18 1/2	470	16 47/64	425		73	70
244.5	9 5/8	10 5/8	269.8	8 13/16	224	18 1/2	470	17 23/32	425		82	81
273	10 ¾	11 19/32	294.4	9 49/64	248	19 11/16	500	17 23/32	450		113	109
298.4	11 ¾	12 ¾	323.8	10 29/32	277	19 11/16	500	17 23/32	450		121	118
323.8	12 ¾	13 13/16	351	11 15/16	303	19 11/16	500	17 23/32	450		134	127
339.7	13 3/8	14 3/8	365.1	12 19/32	320	19 11/16	500	17 23/32	450		143	138
406.4	16	17	431.8	14 59/64	379	19 11/16	500	17 23/32	450		173	170
473.1	18 5/8	20	508	17 11/16	449	19 11/16	500	17 23/32	450		226	225
508	20	21	533.4	18 59/64	480	19 11/16	500	18 5/16	465		232	243

INNER STRING CEMENTING EQUIPMENT

DESTINATION

The inner string cementing equipment is used for cementing the casing strings bigger than 13 3/8 in.
The equipment is used with drill pipe with the diameter of 4 1/2 in and 5 in with thread connection of 4 1/2 IF.
The inner string cementing equipment consists of two subassemblies:

- mushroom type cementing shoe
- connection reduction

CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

• The cementing shoes have the bodies made of various types of materials according to the material grade of which it is made the casing string in which it is mounted.

• According to the type of the thread connection the shoes are manufactured in the following constructions:

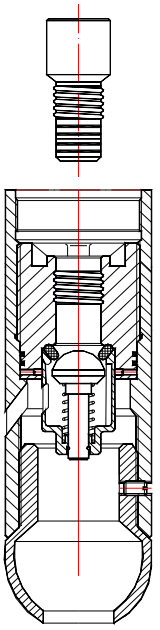
- with round short thread, symbol S
- with round long thread, symbol L
- with Buttress thread, symbol B
- with Extreme-Line thread, symbol EL

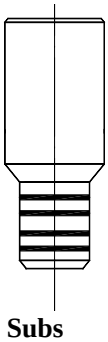
• All component parts of the shoe mounted at the inside are made of easily feasible materials in order to be removed after the cementing operation has been performed.

• The mushroom is the closing element of the shoe and collar and has the role to restrict the circulation of the cement mixture from bottom to top.

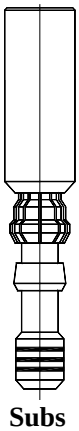
• The connection reduction is made of AISI 4142 steel, heat treated to the mechanical characteristics imposed by API Spec.7-1, thus having a better mechanical resistance to the loads during functioning.

• The connection between the drilling string and the cementing shoe is made by means of the connection reduction.





Subs



Subs

Data to be introduced in the order

1) Shoe nominal dimension
2) Type and dimension of thread connection for shoe
3) Type and dimension of thread connection for reduction
4) Maximum working pressure

CEMENTING HEADS

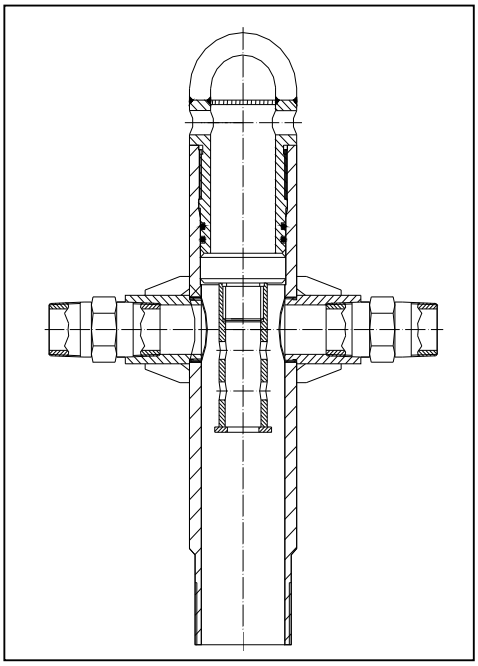
DESTINATION

The cementing head is mounted at the surface after introducing the casing string in the well and is used to circulate the mud, to pump the cement grout for performing the cementing operation in order to prevent the cracks of the formations, the losses through circulation, increase the resistance of the strings.

CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- The body of the cementing head is made of AISI 4142 steel quenched and tempered thus having a good resistance to the mechanical and hydraulic loads to which is subject.
- The body is provided at the lower part with pin thread API Spec. 5CT, in compliance to the one of the casing to which is assembled.
- At the upper part of the cementing head it is mounted a cover which can be opened during functioning to introduce the cementing plugs.
- The body is provided with two sided outlets antipodal located under the cover. In these outlets are mounted the threaded couplings for the tubing.
- The cover is provided at the upper part with a device for pushing the cementing plugs.

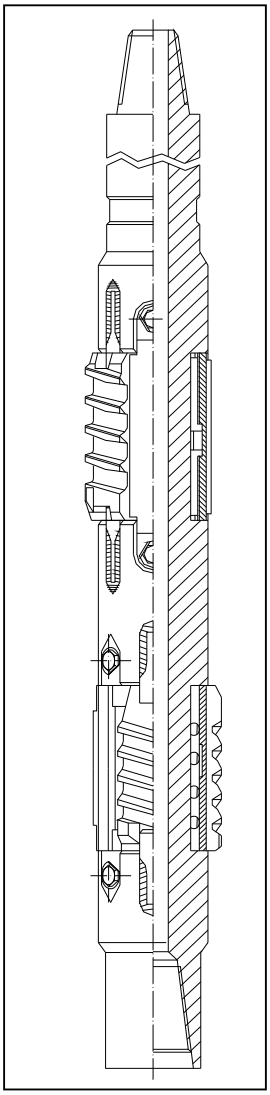
NOMINAL DIMENSION		OD DIAMETER		WORKING PRESSURE	WEIGHT
4 1/2	114,8	3 29/32	99	350	46
5	127	4 ¼	108	350	49
5 ½	139,7	4 11/16	119	350	50
6 5/8	168	5 53/64	148	350	73
7	177,8	6 3/16	157	210	100
7 5/8	193,7	6 51/64	172	210	110
8 5/8	219	7 ¾	197	210	130
9 5/8	244,5	8 25/32	223	210	148
10 ¾	273	9 59/64	252	140	150
11 ¾	298,5	10 29/32	277	140	156
12 ¾	323,8	11 15/16	303	140	182
13 3/8	339,7	12 33/64	318	140	210
14 ¾	374,6	13 7/8	352	140	244
16	406,4	15 1/8	384	70	252
18 5/8	473	17 41/64	448	70	292
20	508	19 7/64	485	70	317



Data to be introduced in the order

1) Nominal dimension
2) Type and dimension of thread connection
3) Maximum working pressure

EXTENSIBLE CASING SCRAPPER FOR CASING STRING



DESTINATION

The casing scrappers are used to scrap the walls of the strings when the operations which follow to be performed in the well are affected by the status of the inner diameter of the strings and smoothness of the walls.

The casing scrappers are used for:

- removing the cement deposits, calcite or paraffin
- removing the bullets stuck during perforation
- removing the junks resulted from the perforation

CONSTRUCTIVE AND FUNCTIONING DESCRIPTION

- The body of the casing scrapper is made of AISI 4142 steel, quenched and tempered, thus having a good resistance to the mechanical and hydraulic loads to which is subject.
- The cutters have a helical shape, with winding on the left, the cutting edge being covered with hard material of tungsten carbide
- According to the type of thread connection, the casing scrappers are made in the following solutions:
  - pin up – box down, symbol C x M
  - box up – box down, symbol M x M
- A simple and string construction

Data to be introduced in the order

1) Nominal dimension
2) Type and dimension of thread connection
3) Constructive solution
4) Range of scrapping (cleaning) diameter

CEMENTING TOOLS

Nominal Dimension		Connection	Over cutter Diameter		OD Body	ID Body	Length	Weight
			min	max				
in	mm	in	mm	mm	mm	mm	mm	kg
4 ½	114	2 3/8 IF	95	105	89	25	1080	50
5	127	2 3/8 Reg 2 7/8 Reg	105	118	95	25	1145	62
5 ½	140	2 3/8 Reg 2 7/8 Reg 3 ½ Reg	114	130	110	30	1175	72
5 ¾	146	2 3/8 Reg 2 7/8 Reg	121	135	110	30	1175	75
6	152	2 7/8 Reg 3 ½ Reg	125	141	110	30	1175	78
6 5/8	168	3 ½ Reg	140	157	133	32	1265	80
7	178	3 ½ Reg	146	170	133	32	1265	110
7 5/8	194	4 ½ Reg	163	183	150	36	1280	145
8 5/8	219	4 ½ Reg	185	210	178	51	1280	160
9 5/8	245	4 ½ Reg	210	235	178	51	1280	165
10 ¾	273	6 5/8 Reg	240	266	235	57	1320	186
11 ¾	290	6 5/8 Reg	260	290	235	57	1320	200
12 ¾	324	6 5/8 Reg	292	315	285	80	1540	458
13 3/8	340	6 5/8 Reg	300	330	285	80	1540	474
14 ¾	377	6 5/8 Reg	335	370	325	89	1615	500

CEMENTING PLUGS

DESTINATION

The cementing plugs are used during cementing operations at the oil and gas wells, having the role to separate the two fluids used at the cementing of the wells, drilling mud and cement grout.

From constructive point of view, the cementing plugs are made in two solutions:

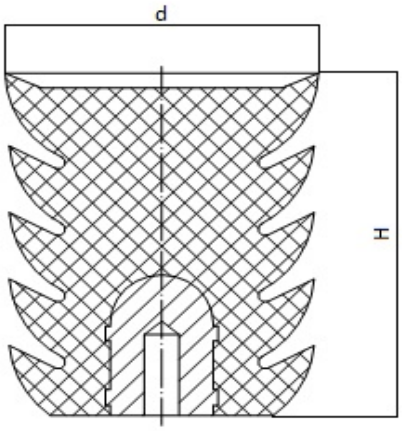
- lower, which are introduced before introducing the cement in the well hole
- upper, which are introduced after introducing the cement in the well hole

The cementing plugs are used for one cementing operation, as they get stuck in the cement following to be milled together with the cement.

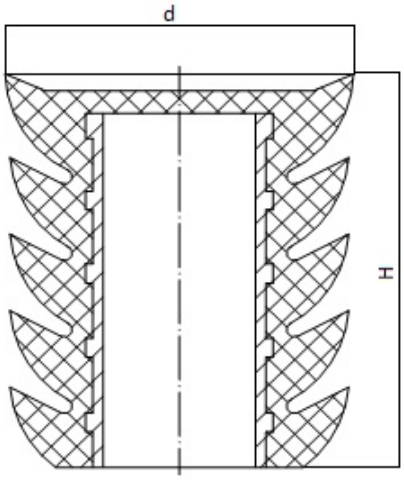
CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- The sleeve of the cement plug is made of rubber resistant to the fluids used during cementing
- The bushing and the core of the plugs are made of easily milling materials.
- The lower cementing plug is introduced through the cementing head and than it is pumped the quantity of cement grout necessary to perform the cementing
- The upper cementing plug is introduced after pumping the entire quantity of cement grout necessary to perform the cementing operation, and behind it comes the drilling mud.

CEMENTING TOOLS



Upper Cementing Plug



Lower Cementing Plug

Data to be introduced in the order
1) Nominal dimension
2) Plug type

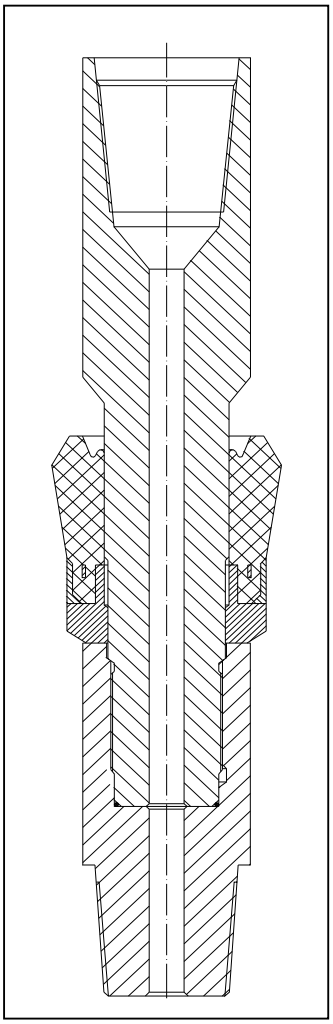
Nominal size	O.D. d	Height H
In	mm	mm
4 ½	103	148
5	112	152
5 ½	126	158
5 ¾	130	160
6 5/8	151	180
7	164	180
8 5/8	200	220
9 5/8	223	220
10 ¾	252	216
12 ¾	300	225
13 3/8	315	240

CUP PLUGS FOR PRESSURE TESTS

DESTINATION

The cup plugs are used to perform the pressure tests of the casing strings and of the equipment for sealing and preventing the eruptions mounted at the well hole.

The maximum temperature, at which the cup plugs are functioning, is imposed by the maximum working pressure of the rubber gaskets, which is 130ºC.



CONSTRUCTIVE AND FUNCTIONAL DESCRIPTION

- The body of the cup plug as well as the lower reduction is made of AISI 4142 steel, heat treated to the mechanical characteristics imposed by API Spec.7, thus having a good mechanical resistance to the loads during functioning.
- Connecting the cup plug to the drilling string is made by threaded connections type box up – pin down.
- The plug is introduced at the desired depth, and than pressure is put on the plug in the annular space between column and rods string to which the plug is connected.

Data to be introduced in the order

1) Nominal dimension
2) Range of inner diameters of the string in which it is used
3) Thread connection

CEMENTING TOOLS

External Diameter of Tubular material	Connection	Internal Diameter of Tubular material		OD of Cups - d	Length L	Working Load	Net Weight
		minim	maxim				
mm (in)	-	mm	mm	mm	mm	tf	kg
114,3 (4 ½)	2 3/8 IF	99,6	103,9	110	608	120	20,085
127 (5)		108,6	115,8	123			20,570
139,7 (5 ½)		118,6	127,3	135			21,005
152,4 (6)	3 ½ IF	128,4	137,8	148	717	225	49,480
168,3 (6 5/8)		144,2	153,7	165			50,660
177,8 (7)		150,4	166,1	178			50,930
193,7 (7 5/8)		168,3	178,5	190			52,310
219,1 (8 5/8)	4 ½ IF	190,8	196,2	208	875	300	101,010
244,5 (9 5/8)		198,8	205,7	218			
273 (10 ¾)		216,8	222,4	238			10,010
		224,4	228,7	244			
		247,9	252,7	268			128,050
		252,7	258,8	276			
298,4 (11 ¾)	6 5/8 REG	273,6	279,4	295			150,410
323,9 (12 ¾)		279,4	281,5	300			
339,7 (13 3/8)		299,9	305,9	325	975	350	127,010
351 (14 ¾)		313,6	317,9	338			189,010
		317,9	322,9	343			
		353	359	380			157,010