



# Refractories for Converter





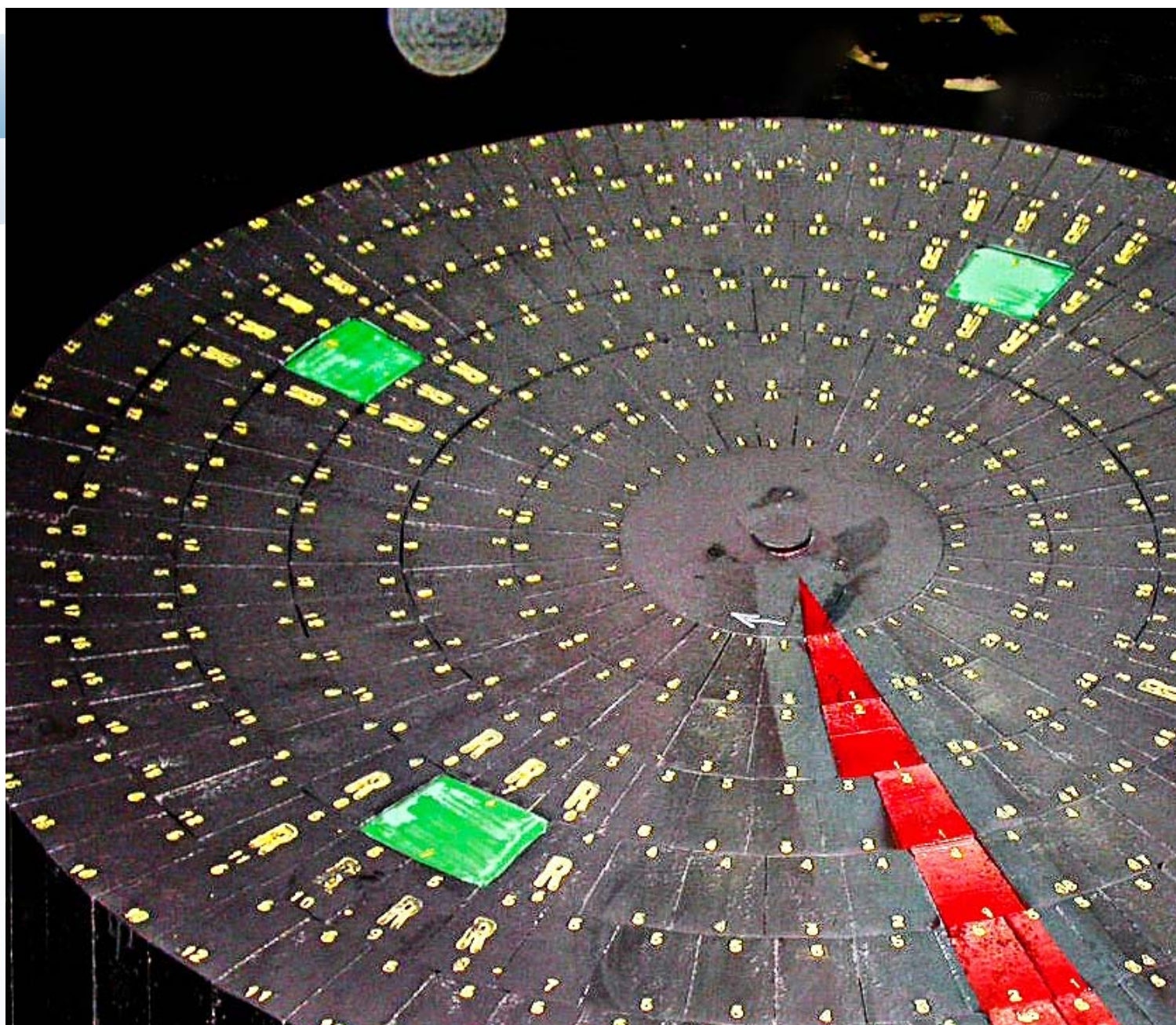
## The chemical physical properties of the products

The tables hereinafter show the main average properties of the products. These properties, verified by internal testings, are merely indicative and should not be used as guaranteed values for tender technical specifications.

In case of special requirements, technical specifications containing the guaranteed values and those detailing the various properties may be agreed with the Customer during sales negotiations.

The individual properties are determined according to ISO Recommendations and Standards Pre Recommendations (Pre Recommendations - Revision June 1990).

In default of recommendations from the two above Bodies or should special tests be required, special rules or company methods may be adopted. Such rules and methods shall be specified and agreed upon with the Customer.

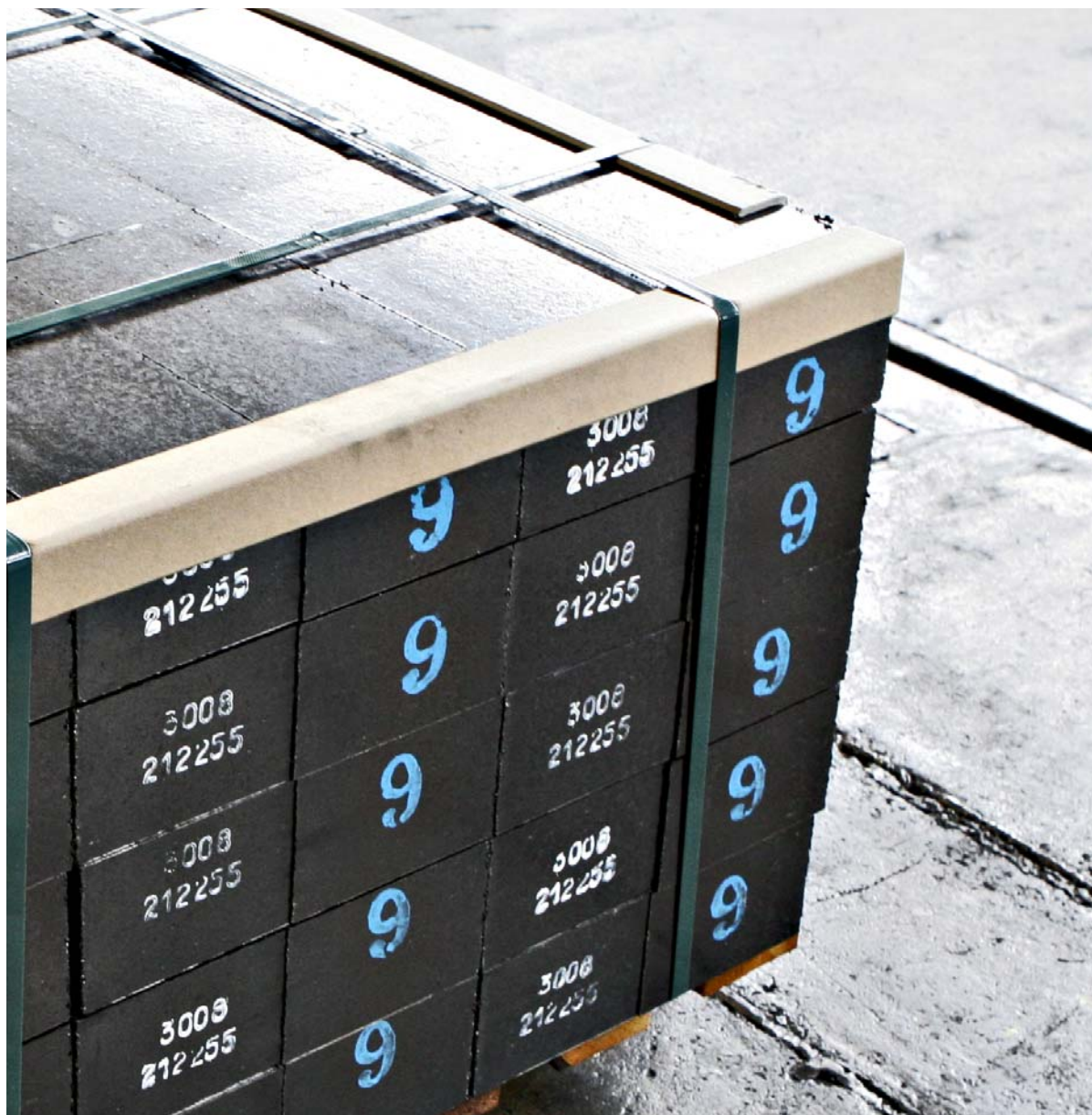


## Brick dimensions (shapes)

The refractory bricks are produced in the great many shapes required for the correct lining of each plant in which they are to be installed.

SANAC is able to produce both the shapes envisaged by the main international standardization rules and the special shapes for specific uses.

The Design Service is at the Customer's disposal to provide him with the most profitable solutions.



## Dimensional Tolerances

The dimensional tolerances of bricks generally conform with the PRE/R23 Recommendation (“Dimensional tolerances of dense and insulating refractory products”).

Particular tolerances, if any, should be indicated at the time of the enquiry and be the subject of tender technical specifications.

## Sorting and checkig

The bricks, removed from the furnaces, after heat treatment, are classified and checked (“Inspection by attributes”) with respect to their dimensional characteristics and their outward appearance (fissures, cracks, chipped edges, stains, etc.). Furthermore, on a statistical basis, controls are carried out on the chemical-physical properties, such as mainly:

- Chemical analysis
- Refractoriness
- Bulk density
- Porosity
- Cold crushing strength
- Modulus of rupture
- Refractoriness under load (R.U.L.)
- Linear thermal expansion
- Permanent linear change
- Thermal shock
- Permeability to gases.

These tests are made on a routine basis in the Quality Control laboratory of each works.

Special test are carried out by the Central Laboratory of Research. The production control is effected in accordance with Assurance Quality System.

## Quality



The qualitative standard of a refractory material has reached such a determinant influence level as to condition the operational results. It is therefore evident the absolute necessity to carry into effect a severe policy of quality in manufacturing.

This policy is imposed by the ever-increasing stresses to which the material is subjected during the operation as well as by the level of high specialization and differentiation reached by refractory products.

In the manufacturing process, therefore all those measures are adopted which are necessary to attain the right quality level and to keep it constant, namely:

- precise processing instructions for each phase of the production process and detailed quality manuals from the raw material control up to the finished products;
- provision of a structure able to produce according to the criteria of the "Quality Assurance".

All our works, as well as all our laboratories, are conform to Assurance Quality System in accordance with UNI EN ISO 9001, certified by DNV as shown at side.

## Services

### RESEARCH AND DEVELOPMENT

Industrial progress, greatly advances in the latest years, imposes more and more severe conditions to refractory linings and demands materials of more and more sophisticated qualities in order to meet the requirements of better performances under every technical and economical aspect.

In order to take active part in this quick developing process, in addition to the individual Works Laboratories charged with the production control and testing (from raw materials to finished products), SANAC owns a Central Laboratory of Research which employs several highly-qualified specialists.

This unit is fitted with all the most modern equipments necessary to the most advanced technological requirements in the sector, it carries out its activity in applied research, in the production and development of new products, in the improvement of the existing products and relevant manufacturing processes. The Central Laboratory of Research is in Vado Ligure.

### DESIGN ENGINEERING AND TECHNICAL ASSISTANCE

The Design Engineering and Technical Assistance Service constitutes an integrated system set up in order to cover all stages from design engineering up to construction and installation. Design engineering is carried out with the C.A.D. system. The Service is in fact a company sector whose function is to find out and solve all problems connected with refractory materials.

It operates on site in close touch with the user and studies the most valid solutions under the technical and economical aspect, thus reaching a precise detailed design engineering of the individual components of a lining.





## Know-how

Sanac technology is active all over the world. In fact, SANAC puts its own experience at the disposal of other producers of refractory materials.

Many are the know-how agreements stipulated with foreign countries. The collaboration supplied by the Company mainly consists of:

- setting out of the most up-to-date production cycles;
- supervision of plant final design engineering;
- supervision of plant erection and start-up;
- supply of complete know-how;
- training of the Customer's technical

personnel in order to hit the production targets.

From Company's profile it is possible to identify the principles which are at the base of its activity and which explain its constant progress in a world-wide refractory industry.





## Converter

Even if today it is only a melting equipment, the converter is still heart of integrated cycle steel production. The converter operating conditions are the most severe for refractory linings.

Sanac wide range of resin bonded magnesia carbon products for all Converter kinds, is integrated with ecological pitch post-impregnated products to be installed in particularly stressed areas of the lining.

## Sanac's works

1. 13045 GATTINARA (VC)  
Corso Garibaldi, 321  
Tel. 0163 824711  
Fax 0163 89321
2. 17047 VADO LIGURE (SV)  
Via Manzoni, 10  
Tel. 019 28951  
Fax 019 882555
3. 54100 MASSA  
Via Dorsale, 7  
Zona Industriale  
Tel. 0585 799001  
Fax 0585 799031
4. 09032 ASSEMINI (CA)  
Loc. Grogastu  
Zona Ind. Macchiareddu  
Tel. 070 24651  
Fax 070 247058



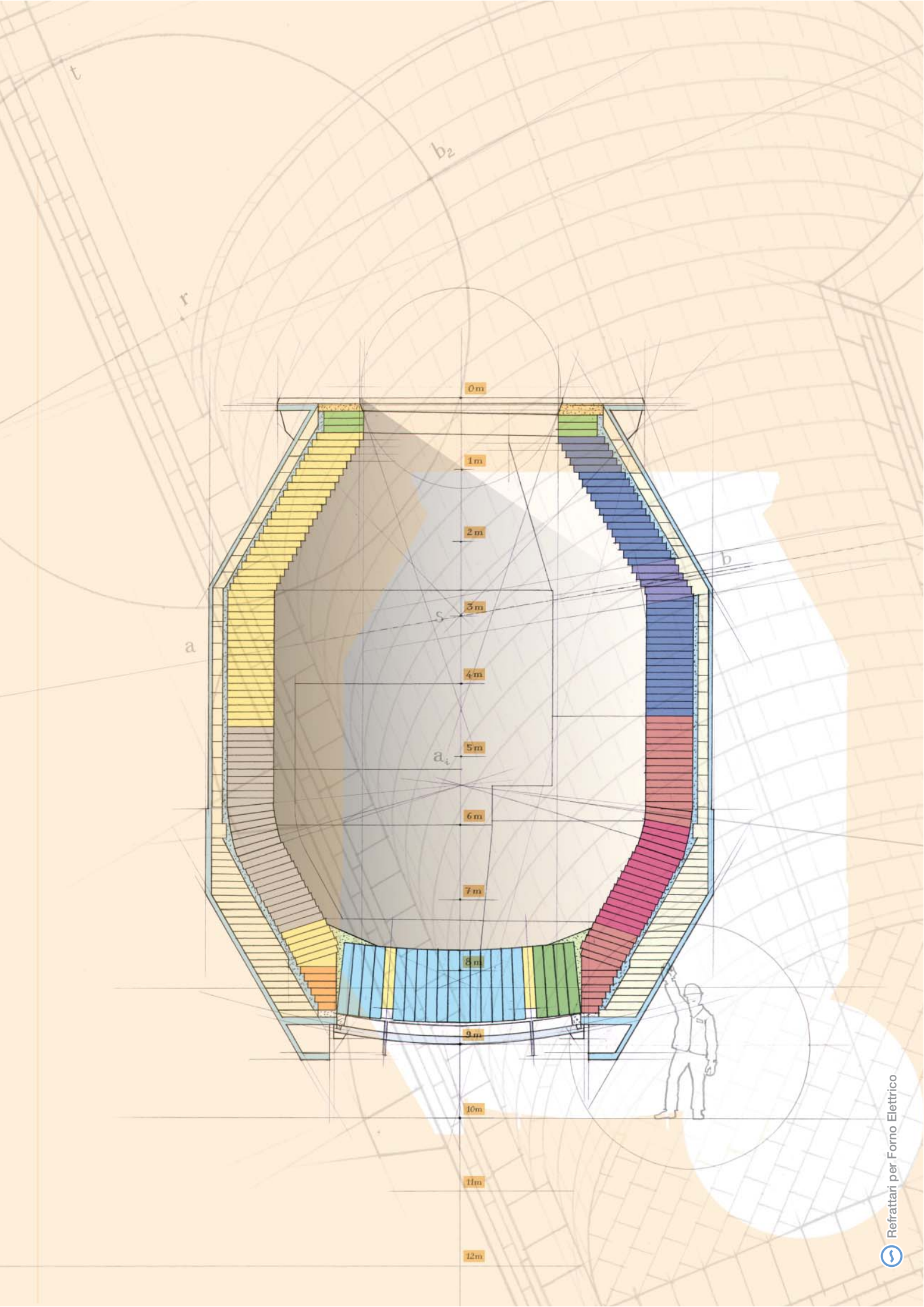


# Products

Refractories for Converter







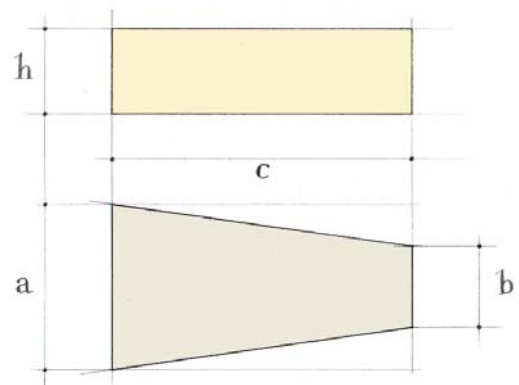
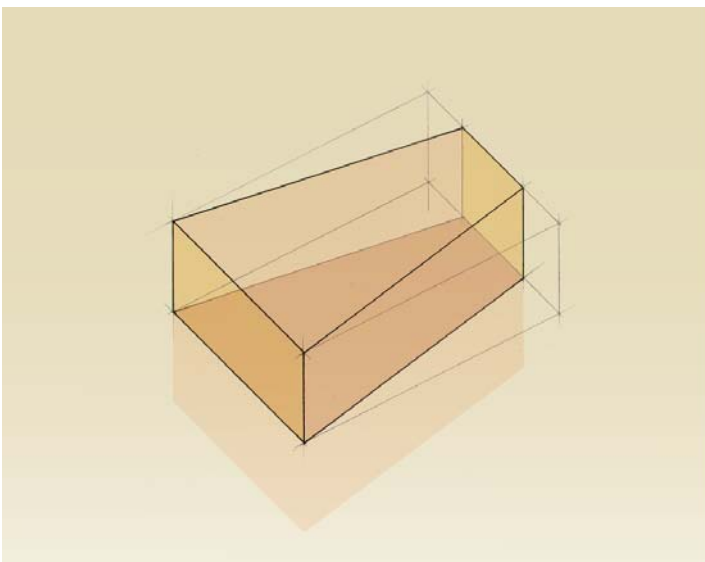
## Converter standard shapes

### WEAR LINING

#### KEY AND STRAIGHT

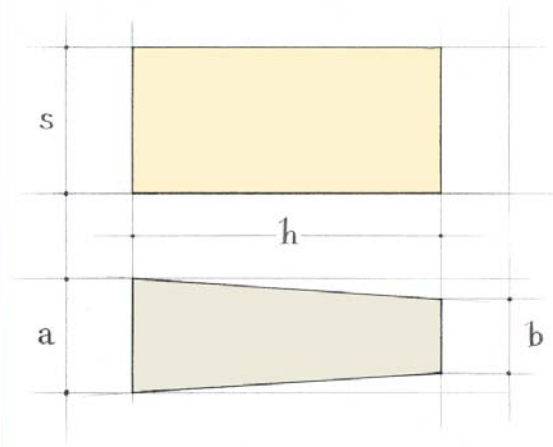
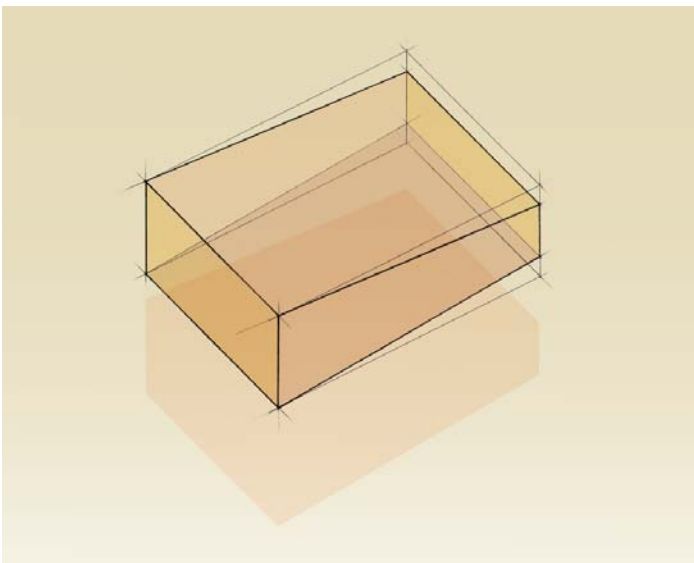
Code	Dimensions (mm)				Volume (dm <sup>3</sup> )
	a	b	c	h	
20/0	150	150	200	100	3,00
20/8	154	146	200	100	3,00
20/16	158	142	200	100	3,00
20/30	180	120	200	100	3,00
25/60	180	120	250	100	3,75
25/30	165	135	250	100	3,75
25/16	158	142	250	100	3,75
25/8	154	146	250	100	3,75
25/0	150	150	250	100	3,75
30/70	185	115	300	100	4,50
30/40	170	130	300	100	4,50
30/20	160	140	300	100	4,50
30/8	154	146	300	100	4,50
30/0	150	150	300	100	4,50
35/80	190	110	350	100	5,25
35/40	170	130	350	100	5,25
35/20	160	140	350	100	5,25
35/8	154	146	350	100	5,25
35/0	150	150	350	100	5,25
40/80	190	110	400	100	6,00
40/40	170	130	400	100	6,00
40/20	160	140	400	100	6,00
40/8	154	146	400	100	6,00
40/0	150	150	400	100	6,00
45/90	195	105	450	100	6,75
45/40	170	130	450	100	6,75
45/20	160	140	450	100	6,75
45/8	154	146	450	100	6,75
45/0	150	150	450	100	6,75
50/60	180	150	450	100	7,43
50/36	168	150	450	100	7,16
50/20	160	150	450	100	6,98
50/8	154	150	450	100	6,84
50/0	150	150	450	100	6,75
55/60	180	120	550	100	8,25
55/36	168	132	550	100	8,25
55/20	160	140	550	100	8,25
55/8	154	146	550	100	8,25
55/0	150	150	550	100	8,25
60/60	180	120	600	100	9,00
60/36	168	132	600	100	9,00
60/20	160	140	600	100	9,00
60/8	154	146	600	100	9,00
60/0	150	150	600	100	9,00
65/60	180	120	650	100	9,75

Code	Dimensions (mm)				Volume (dm <sup>3</sup> )
	a	b	c	h	
65/36	168	132	650	100	9,75
65/20	160	140	650	100	9,75
65/8	154	146	650	100	9,75
65/0	150	150	650	100	9,75
70/60	180	120	700	100	10,50
70/36	168	132	700	100	10,50
70/20	160	140	700	100	10,50
70/8	154	146	700	100	10,50
70/0	150	150	700	100	10,50
75/60	180	120	750	100	11,25
75/36	168	132	750	100	11,25
75/20	160	140	750	100	11,25
75/0	150	150	750	100	11,25
80/60	180	120	800	100	12,00
80/36	168	132	800	100	12,00
80/20	160	140	800	100	12,00
80/8	154	146	800	100	12,00
80/0	150	150	800	100	12,00
85/80	190	110	850	100	12,75
85/20	160	140	850	100	12,75
90/80	190	110	900	100	13,50
90/20	160	140	900	100	13,50
90/8	154	146	900	100	13,50
90/0	150	150	900	100	13,50
100/60	180	120	1000	100	15,00
100/41	170,5	129,5	1000	100	15,00
100/20	160	140	1000	100	15,00
100/8	154	146	1000	100	15,00
100/0	150	150	1000	100	15,00
100/8-71	75	67	1000	100	7,10
100/8-100	114	106	1000	100	11,00



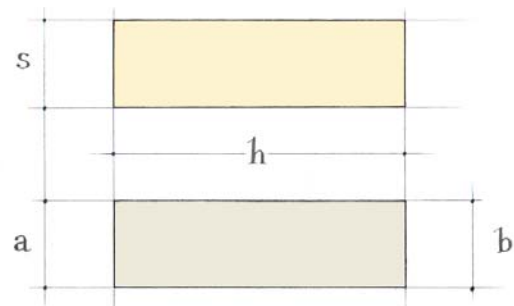
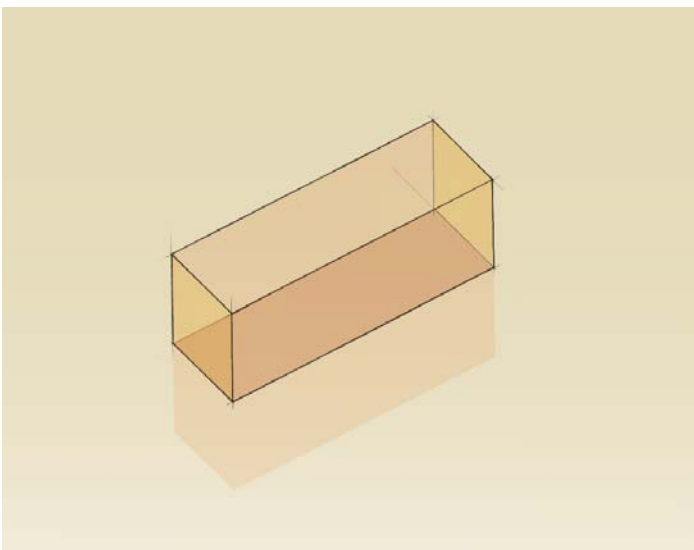
## WEDGE

Code	Dimensions (mm)				Volume (dm <sup>3</sup> )
	a	b	c	h	
3025/6	110	104	300	225	7,22
3025/15	110	95	300	225	6,92
4025/8	110	102	400	225	9,54
4025/20	110	90	400	225	9,00
5025/10	110	100	500	225	11,81
5025/25	110	85	500	225	10,97



## STRAIGHT

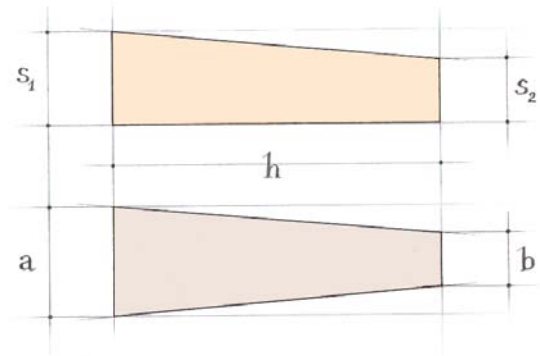
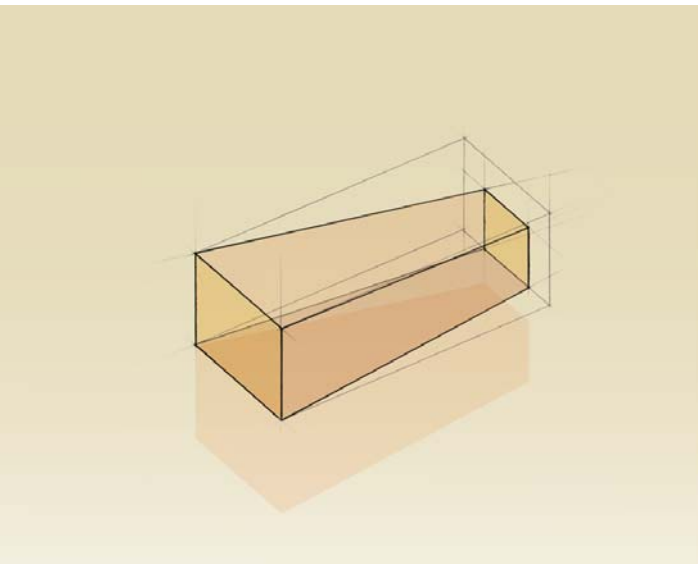
Code	Dimensions (mm)				Volume (dm <sup>3</sup> )
	a	b	c	h	
6520/0	200	200	650	200	26,00
7520/0	200	200	750	200	30,00





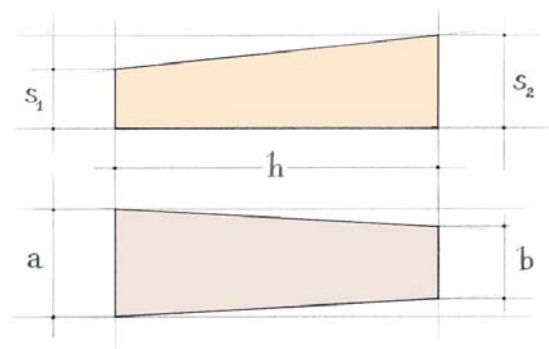
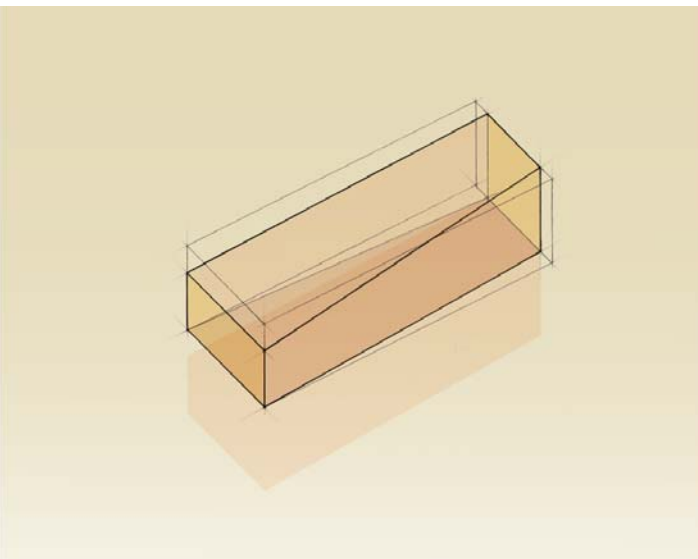
### KEY AND WEDGE - "D" SERIE

Code	Dimensions (mm)					Volume (dm <sup>3</sup> )
	a	b	h	s <sub>1</sub>	s <sub>2</sub>	
60/20D26	160	140	600	120	93,4	9,60
60/60D26	180	120	600	120	93,4	9,60
6520/58	200	200	650	120	91,2	13,73
65/36D32	168	132	650	105	73	8,68
65/20D32	160	140	650	105	73	8,68



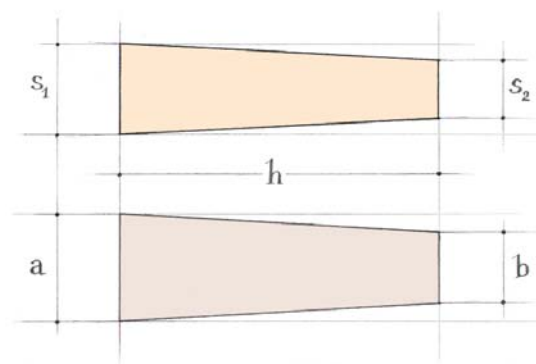
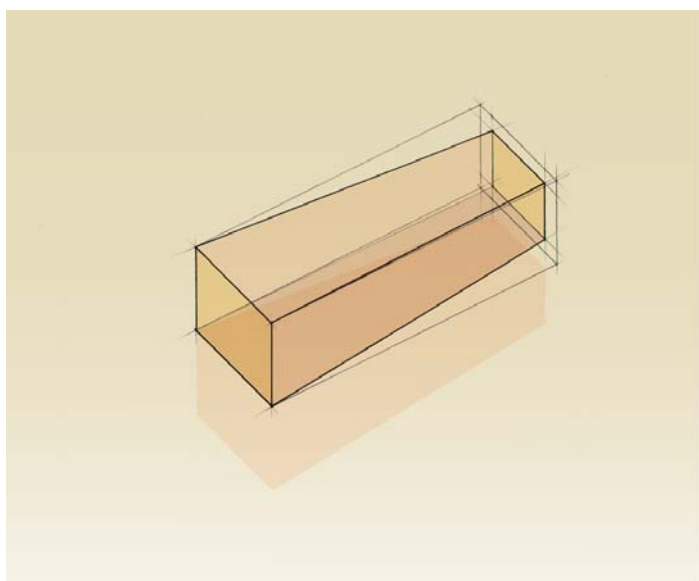
### KEY AND WEDGE - "C" SERIE

Code	Dimensions (mm)					Volume (dm <sup>3</sup> )
	a	b	h	s <sub>1</sub>	s <sub>2</sub>	
60/20C26	160	140	600	93,4	120	9,60
60/60C26	180	120	600	93,4	120	9,60



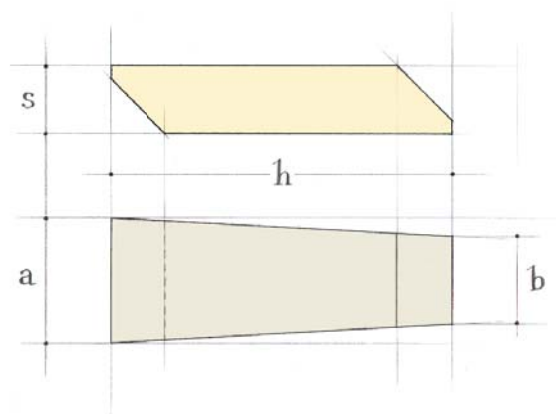
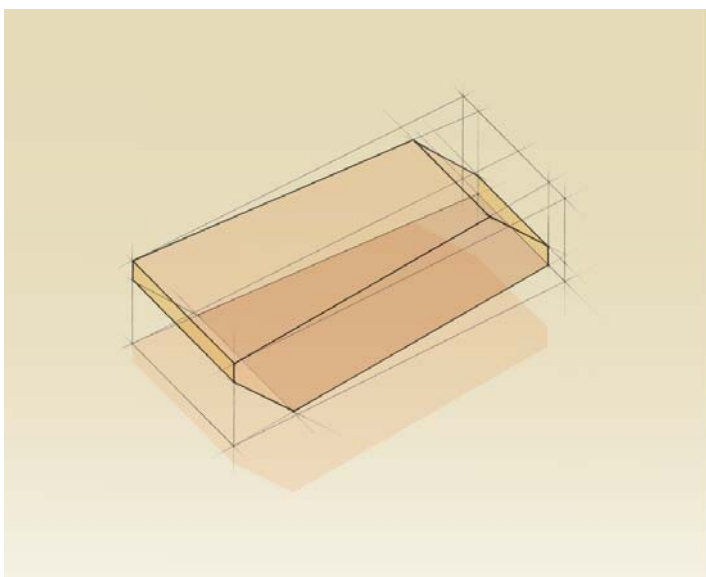
### KEY AND WEDGE - "K" SERIE

Code	Dimensions (mm)					Volume (dm <sup>3</sup> )
	a	b	h	s <sub>1</sub>	s <sub>2</sub>	
K60	150	136,2	600	110	99,9	9,01
K70-TA	150	133,9	700	110	98,2	10,34
K70-PIO	150	130,5	700	110	95,7	10,10
K80-TA	150	131,6	800	110	96,5	11,63



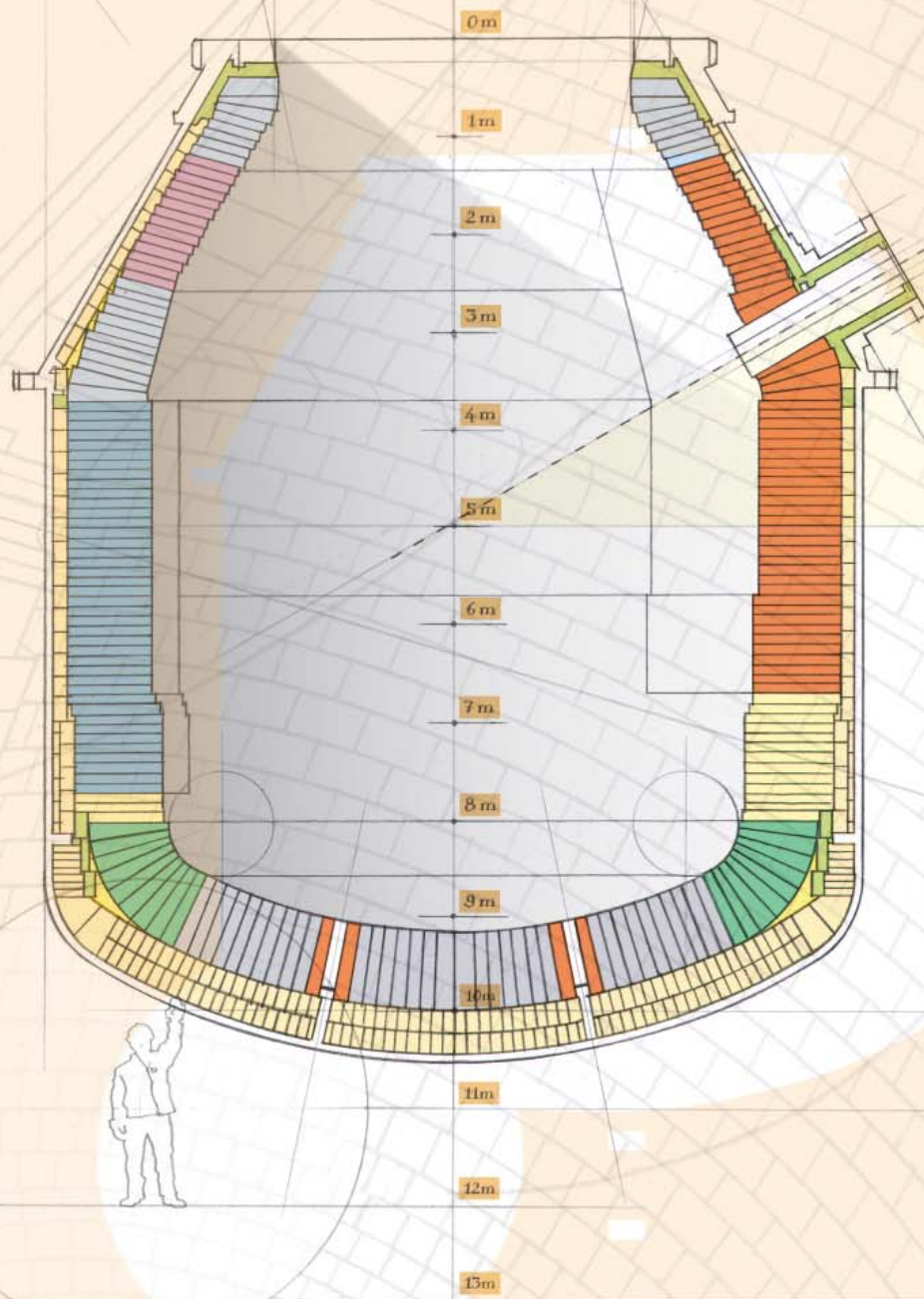
### BEVELED KEY - "HT" SERIE

Code	Dimensions (mm)				Volume (dm <sup>3</sup> )
	a	b	h	s	
HT 60/20	160	140	600	100	8,39
HT 60/60	180	120	600	100	8,39
HT 60/80	190	110	600	100	8,39
HT 65/20	160	140	650	100	9,14
HT 65/80	190	110	650	100	9,14
HT 70/20	160	140	700	100	9,89
HT 70/80	190	110	700	100	9,89
HT 80/20	160	140	800	100	11,39
HT 80/80	190	110	800	100	11,39



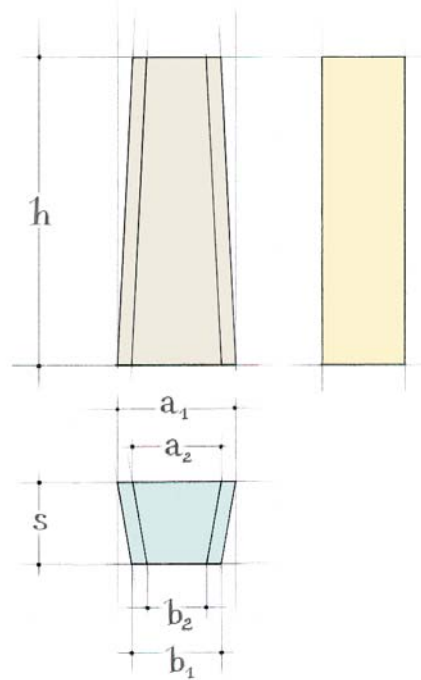
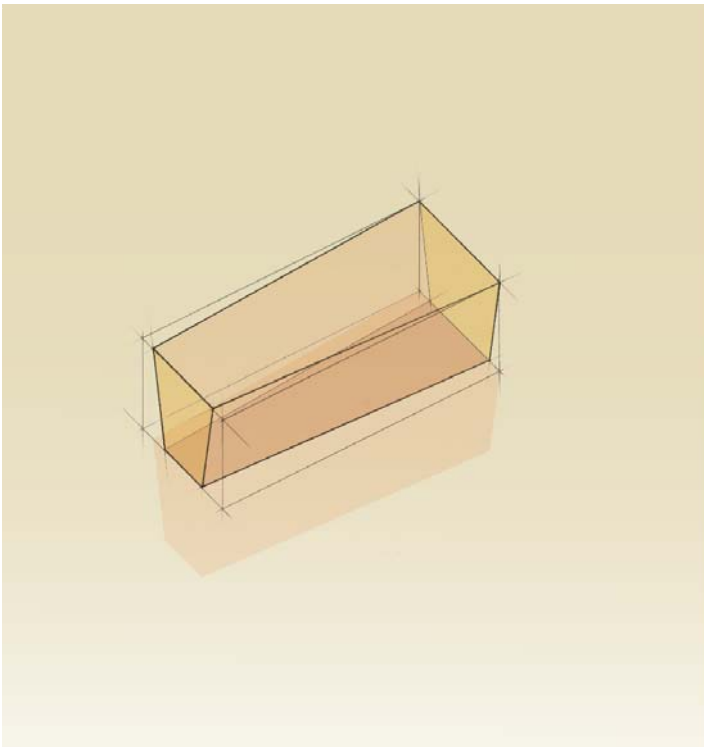


$b_1$



## Converter shapes for continuous bottom

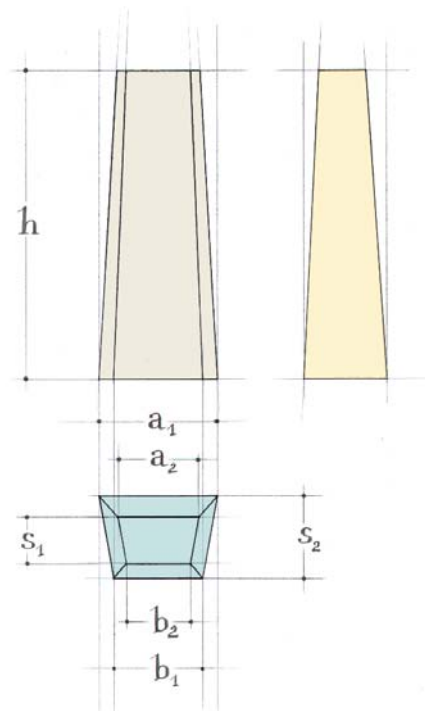
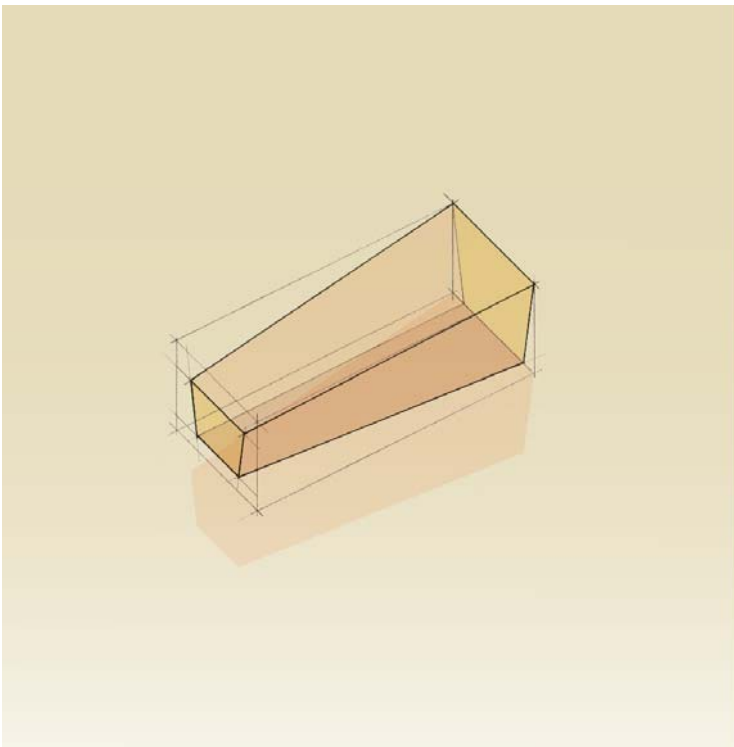
WEAR LINING							
DUBLE TAPERED							
Code	Dimensions (mm)						Volume (dm <sup>3</sup> )
	a <sub>1</sub>	a <sub>2</sub>	b <sub>1</sub>	b <sub>2</sub>	s	h	
70 VCA-1	112	95,5	100	84	130	700	8,91
70 VCA-2	111,5	96,5	105	89	130	700	9,15
70 VA	92	92	92	92	130	700	8,37
80 VCA-1	112	94	100	82	130	800	10,09
80 VCA-2	111,5	94	105	87	130	800	10,34
80 VA	92	92	92	92	130	800	9,57
80 PIO	103,5	92	103,5	92	130	800	10,17



## TRIPLE TAPERED

Code	Dimensions (mm)							Volume (dm <sup>3</sup> )
	a <sub>1</sub>	a <sub>2</sub>	b <sub>1</sub>	b <sub>2</sub>	s <sub>1</sub>	s <sub>2</sub>	h	
70 PSR-1	87	65,5	77,5	65	76,5	170,2	700	6,65
70 PSR-2	85,5	63,5	79	60,5	76,5	170,2	700	5,90
70 PSR-3	85	60	80,5	58	76,5	170,2	700	5,73
70 PSR-4	84,5	58	82	57	76,5	170,2	700	5,65
70 PSR-5	84	57,5	83,5	57	76,5	170,2	700	5,65
70 PSR-6	92	92	92	92	76,5	170,2	700	7,94
70 PSR-D1	88,5	76	80,5	72,5	76,5	170,2	700	6,69
70 PSR-D2	87	70	81	67,1	76,5	170,2	700	6,33
70 VXC 50/1	92	79	79,5	68,5	126,2	147	700	7,58
70 VXC 50/2	92	79	86	74	126,2	147	700	7,87
70 VX 50	92	79	92	79	126,2	147	700	8,13
70 VXC 50/A	77	67	46	40,5	126,2	147	700	5,48
70 VXC 50/B	108	93	77	67	126,2	147	700	8,20
70 VXC 50/C	86,5	74,5	67	58	126,2	147	700	6,80
70 VXC 50/D	105,5	91	86,5	74,5	126,2	147	700	8,50
70 VX 56	100	85	100	85	110	129,2	800	8,79
70 VXC 65/1	106,5	95,5	92,5	82,75	129,4	145	700	9,03
70 VXC 65/2	106,5	95,5	100,5	89,91	129,4	145	700	9,39
80 PSR-1	89,5	69,5	79	65	76,5	183,6	800	8,25
80 PSR-2	89	63,5	81,5	60,5	76,5	183,6	800	7,16
80 PSR-3	88,5	60	83,5	58	76,5	183,6	800	6,96
80 PSR-4	88	58	85,5	57	76,5	183,6	800	6,88
80 PSR-5	88	57,5	88	57	76,5	183,6	800	6,90
80 PSR-6	92	92	92	92	76,5	183,6	800	9,57
80 PSR-1N	90	74,5	83	71,5	76,5	183,6	800	8,01
80 PSR-3N	90	68,5	85,5	66,5	76,5	183,6	800	7,64
80 PSR-7N	90	65,5	88	64,5	76,5	183,6	800	7,50
80 PSR-3N/88	88	63,5	86	62,5	76,5	183,6	800	7,29
80 PSR-9N	95	69	94,5	68,5	76,5	183,6	800	7,95
80 VXC 56/1	100	85	87	74	110	129,2	800	8,22
80 VXC 56/2	100	85	93,5	79,5	110	129,2	800	8,51
80 VX 56	100	85	100	85	110	129,2	800	8,79
80 VXC 56/A	62,5	53	40	34	110	129,2	800	4,50
80 VXC 56/B	85,5	72,5	62,5	53	110	129,2	800	6,50
80 VXC 56/C	108	91,5	85,5	72,5	110	129,2	800	8,49
80 VXC 56/AD	130,5	110,5	108	91,5	110	129,2	800	10,47
80 VXC 56/E	76	64,5	65	55	110	129,2	800	6,19
80 VXC 65/1	106,5	93,5	92,5	81,5	127,2	145	800	10,14
80 VXC 65/2	106,5	93,5	100,5	88,5	127,2	145	800	10,54
80 VX 65	106,5	93,5	106,5	93,5	127,2	145	800	10,84
80 VXC 65/A	76,5	67	46	40,5	127,2	145	800	6,23
80 VXC 65/BM	80	70,5	57,5	50,5	127,2	145	800	7,01
80 VXC 65/C	85,5	75,5	67	58,5	127,2	145	800	7,77
80 VXC 65/D	104,5	92	86	75	127,2	145	800	9,69

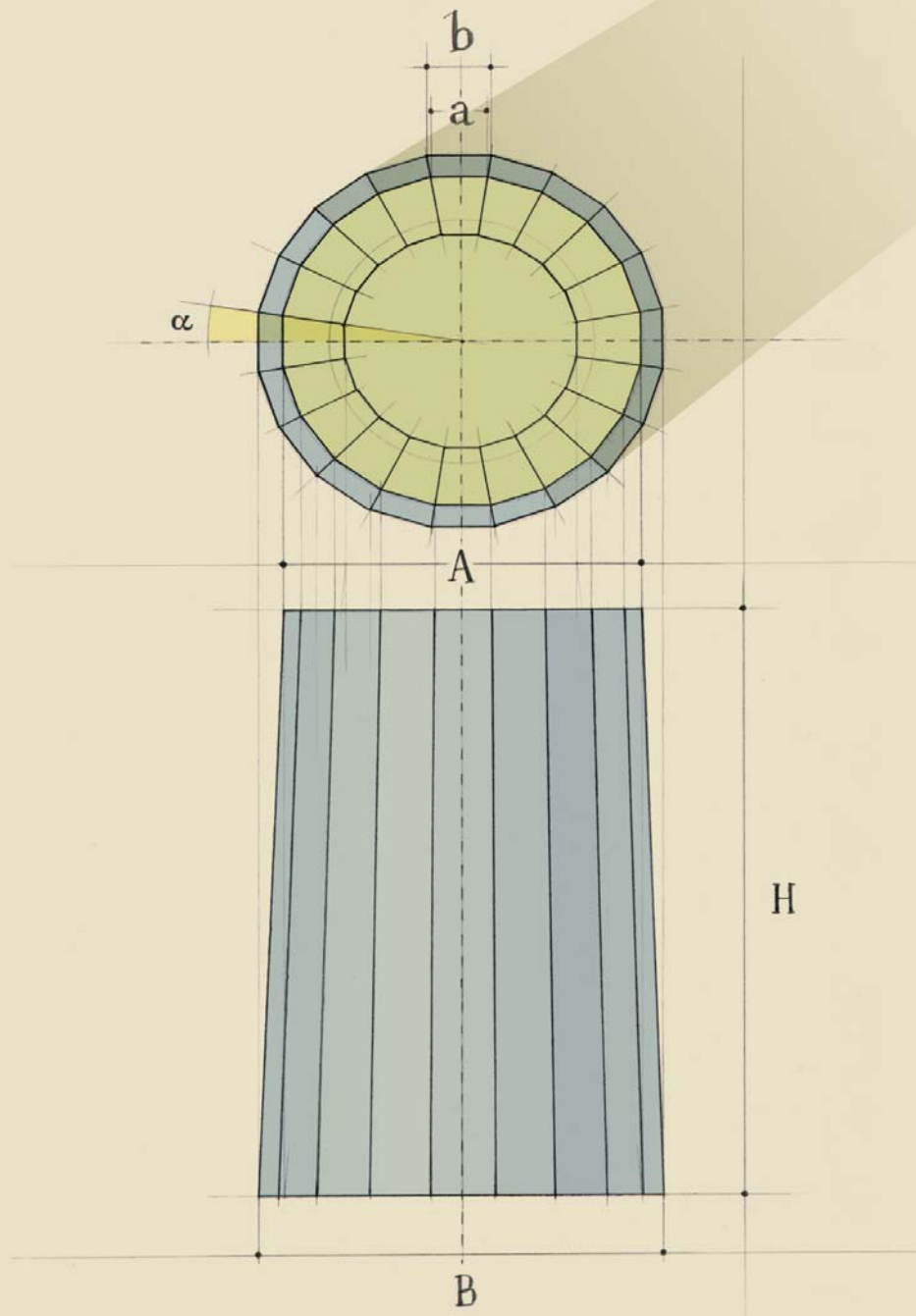
Code	Dimensions (mm)							Volume (dm <sup>3</sup> )
	a <sub>1</sub>	a <sub>2</sub>	b <sub>1</sub>	b <sub>2</sub>	s <sub>1</sub>	s <sub>2</sub>	h	
VX 9093/0	93	71,5	93	71,5	88,5	150	900	8,53
100 PSR-2	92	64,5	85	62,15	201	66,5	1000	11,00
100 PSR-3	92	60,5	87	58,99	201	66,5	1000	10,98
100 PSR-4	92	58,5	89	57,61	201	66,5	1000	11,03
100 PSR-5	92	57,5	91	57,3	201	66,5	1000	11,10
100 PSR-6	92	92	92	92	201	66,5	1000	12,31
100 VXC 68/1	110	93,5	94	80	110	129,1	1000	11,21
100 VXC 68/2	110	93,5	104,5	89	110	129,1	1000	11,79
100 VX 68	100	85	100	85	110	129,1	1000	10,99
100 VXC 68/A	88,5	75,5	57,5	49	110	129,1	1000	8,03
100 VXC 68/BM	97	83	72	61,5	110	129,1	1000	9,31
100 VXC 68/C	81,5	69,5	65	55,5	110	129,1	1000	8,06
100 VXC 68/D	98,5	84	81,5	69,5	110	129,1	1000	9,90
100 VXC 68/E	77	65,5	65,5	56	110	129,1	1000	7,84





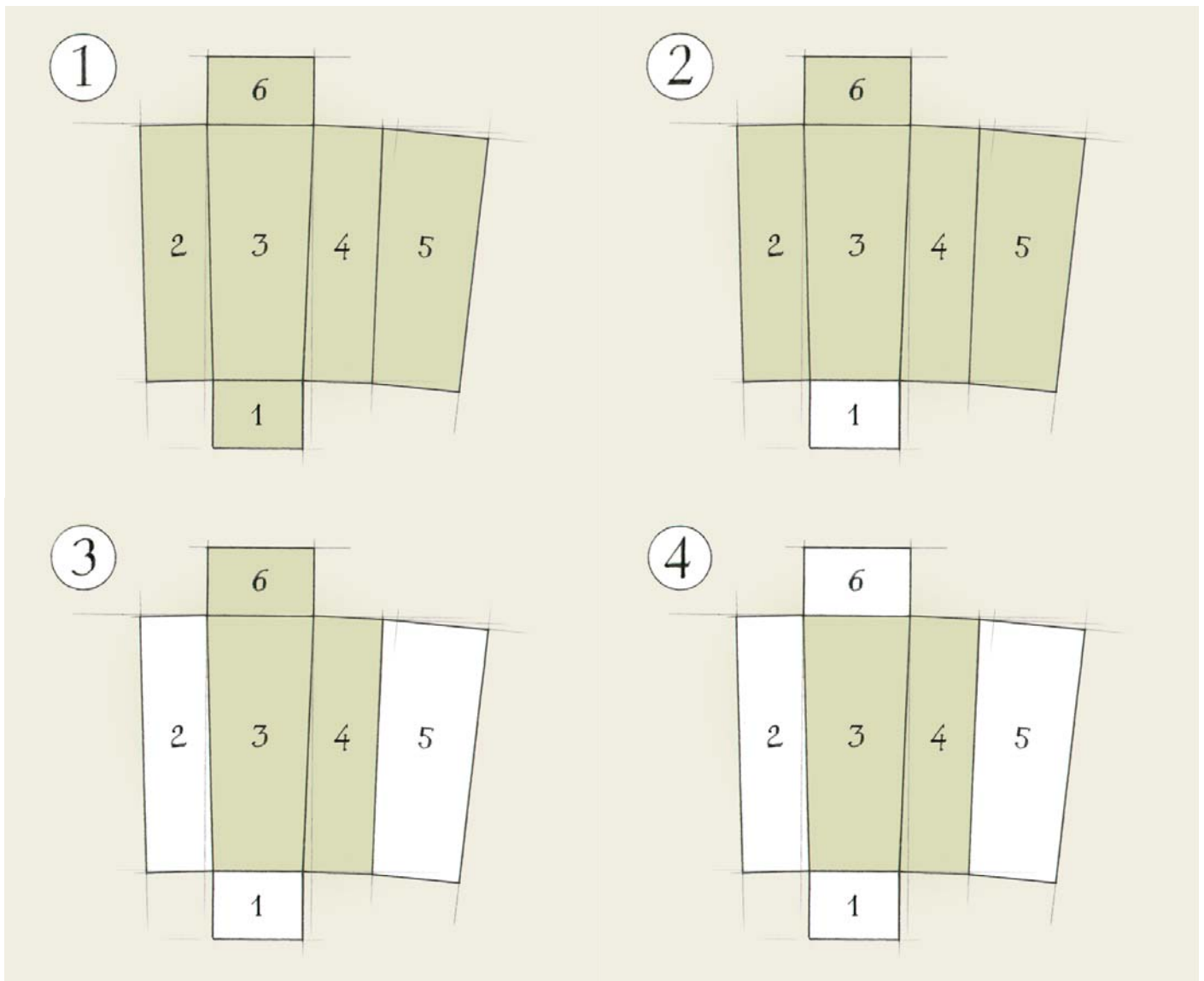
## STARTING BLOCK

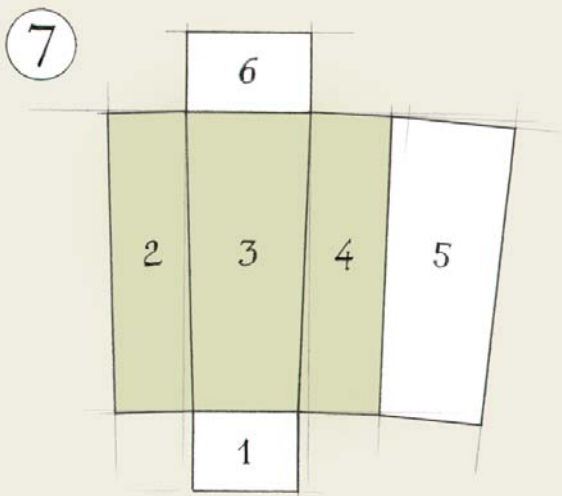
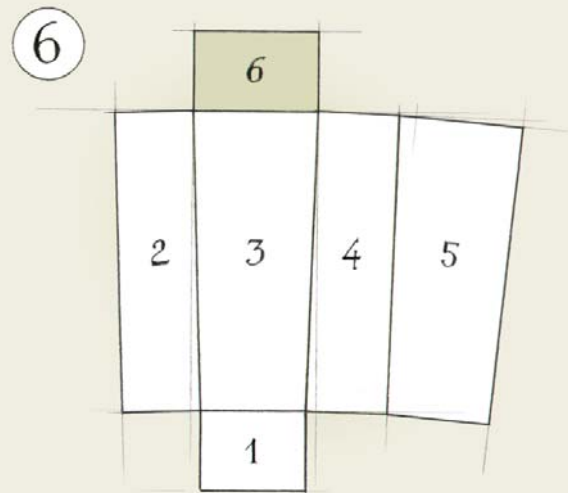
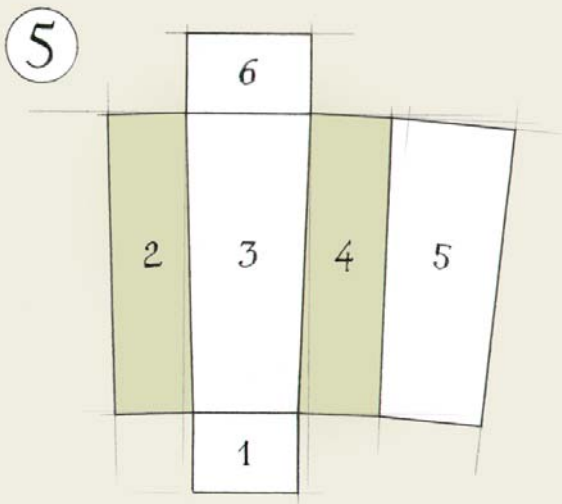
Code	Dimensions (mm)						Volume (dm <sup>3</sup> )
	B	A	H	b	a	$\alpha^\circ$	
70 T 50	442	385	700	46,5	40,5	12	94,05
80 T 65	441	387	800	46	40,4	12	105,00
100 T 68	476,16	405,72	1000	57,39	48,9	13,85	152,20
100 T 68 - EKO	470,57	400,95	1000	61,95	52,79	15	149,40



## Steel cased bricks

All wear lining bricks mentioned in above tables can be supplied steel cased in order to increase the mechanical characteristics. Possible combinations, and relevant codes, are shown below:





①	FX .....	
②	FX .....	KK
③	FX .....	K
④	FX .....	L
⑤	FX .....	H
⑥	FX .....	C
⑦	FX .....	U

Spessore scatlatura 0.9 - 1 mm  
 Spessore scatlatura 0.6 mm (Massa)

## SAFETY BRICKS

PRODUCT			PEREX	PEREX 21
Main product			Magnesite	Magnesite
<b>CHEMICAL ANALYSIS (ON RAW MATERIALS OXIDES)</b>				
MgO		%	92,0	96,0
CaO		%	1,5 - 2,0	2,2
SiO <sub>2</sub>		%	3,0 - 4,0	1,0
Fe <sub>2</sub> O <sub>3</sub>		%	1,5 - 2,0	0,3
Al <sub>2</sub> O <sub>3</sub>		%	-	-
TiO <sub>2</sub>		%	-	-
C		%	-	-
<b>PHYSICAL PROPERTIES</b>				
Refractoriness		SK	-	-
Density		Kg/dm <sup>3</sup>	2,90	2,95
Apparent porosity		%	< 18,5	< 18,0
Cold crushing strength		Kg/cm <sup>2</sup>	> 500	> 500
Modulus of rupture after hearthing	at 1.250°C	Kg/cm <sup>2</sup>	-	-
	at 1.450°C	Kg/cm <sup>2</sup>	-	-
Refractoriness under load t 0,5		°C	1.500	1.700
Permanent linear change	2 h at	°C	-	-
		%	-	-
Linear expansion at 1.000°C		%	-	-
Creep a 2 kg/cm <sup>2</sup> 50 ore		a °C	-	-
		%	-	-
Thermal conductivity	a 600°C	W/mK	6,0	5,2
	a 1.200°C	W/mK	3,5	3,0
Characteristics			High mechanical resistance	High slag resistance

## WEAR LINING

PRODUCT	Chemical analysis on raw materials				PHYSICAL PROPERTIES					Thermal conductivity	
	MgO	CaO	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	C	Density	A. P.	C.C.S.	M.R.	at 500°C	at 1.000°C
	%	%	%	%	% fixed	Kg/dm <sup>3</sup>	gr/cm <sup>2</sup>	gr/cm <sup>2</sup>	Kg/cm <sup>2</sup>	W/mK	
CP260	97,10	1,95	0,30	0,35	5,0	2,99	5,0	400	100	4,6	3,7
LCPO16RB	96,15	1,35	0,60	0,60	5,5	2,97	5,0	400	90	4,8	4,0
LCP183LCL	97,45	1,50	0,40	0,35	6,5	2,98	5,0	400	100	6,4	4,9
LCP248	97,45	1,50	0,25	0,25	5,5	3,05	5,0	350	80	4,8	4,0
LCM65RBS	95,65	1,45	0,65	0,65	6,5	2,96	6,5	350	90	6,4	4,9
LCP089S	97,55	1,40	0,35	0,45	6,5	3,03	5,0	400	100	6,4	4,9
LCP211S	97,65	1,20	0,40	0,50	7,0	3,01	5,0	400	100	7,3	5,6
CP008S	97,00	2,20	0,20	0,20	8,5	2,96	5,0	350	80	8,7	7,0
CP134	97,20	1,40	0,55	0,60	8,5	3,00	5,0	400	100	8,7	7,0
CP066/RB	97,45	1,55	0,30	0,25	10,0	3,04	5,0	350	80	11,4	8,4
CP148FM/RB	98,35	1,00	0,25	0,25	10,0	2,99	5,0	350	80	11,4	8,4
CP242	98,55	0,90	0,20	0,25	10,0	2,97	5,0	250	55	11,4	8,4
CP116V	97,50	1,45	0,45	0,35	10,0	3,03	3,0	450	100	11,4	8,4
CP 045	96,75	1,40	0,65	0,55	10,5	2,99	5,0	350	80	11,6	8,6
CP12LRB	97,00	2,20	0,20	0,20	10,0	2,90	5,0	300	80	11,4	8,4
CP204SE	95,15	1,65	0,65	0,50	10,0	2,93	5,0	300	80	11,4	8,4
CP161EE	97,50	1,25	0,45	0,55	10,0	2,93	5,0	350	90	11,4	8,4
CP151TE	97,10	1,20	0,45	0,55	10,0	3,04	5,0	350	90	11,4	8,4
CP067	97,30	1,75	0,35	0,30	10,0	3,01	5,0	350	80	11,4	8,4
CP067M	97,30	1,75	0,35	0,30	10,0	2,92	5,0	350	80	11,4	8,4
CP111S	96,95	1,40	0,60	0,50	10,0	2,99	5,0	350	80	11,4	8,4
CM9RBS	96,40	1,30	0,60	0,55	10,5	2,95	6,0	350	80	11,6	8,6
CP12LRBS	97,00	2,20	0,20	0,20	10,5	2,91	5,0	300	70	11,6	8,6
CP 146 F	97,45	1,45	0,40	0,45	10,5	2,94	5,0	350	80	11,6	8,6
CP237	97,60	1,30	0,50	0,40	12,0	2,98	5,0	300	80	12,2	9,3
CP216S	97,30	1,75	0,35	0,30	13,0	2,92	5,0	300	80	12,8	9,9
CP214ERM	97,60	1,30	0,50	0,40	14,0	2,88	5,0	300	80	13,4	10,5
CP153S	97,65	1,15	0,40	0,50	14,0	2,93	5,0	300	80	13,4	10,5
CP063	97,30	1,75	0,35	0,30	14,0	2,87	5,0	350	80	13,4	10,5
CP14RSS	98,00	0,85	0,20	0,50	14,0	2,89	5,0	300	80	13,4	10,5
CP14ZRBS	97,00	2,20	0,20	0,20	14,0	2,91	5,0	300	70	13,4	10,5
CP14E45RSS	97,30	1,75	0,35	0,30	14,0	2,95	5,0	300	70	13,4	10,5
CP14EZ4RBS	97,30	1,75	0,35	0,30	14,0	2,91	5,0	300	80	13,4	10,5
CP14L	97,00	2,20	0,20	0,20	14,0	2,92	5,0	300	80	13,4	10,5
CP767	97,10	1,60	0,50	0,45	14,0	2,95	5,0	300	80	13,4	10,5
CP214ER	97,60	1,30	0,50	0,40	14,0	2,88	5,0	300	80	13,4	10,5
CP241	98,50	0,90	0,20	0,25	15,0	2,93	5,0	250	55	14,8	11,6
CP788S	97,30	1,75	0,35	0,30	16,5	2,91	5,0	300	80	16,3	12,2
CP234	97,45	1,25	0,50	0,55	17,0	2,89	5,0	300	80	16,6	12,4
CP235	97,40	1,30	0,50	0,55	17,0	2,90	5,0	300	80	16,6	12,4

## CEMENTS

CEMENTS				
PRODUCT	MAGBOND			
		MC	QBB	95 ECO
UNI EN Classification 14 02	JOINT MATERIAL			
Main product	Magnesia			
CHEMICAL ANALYSIS (ON RAW MATERIALS OXIDES)				
MgO	87,9	92,4	92,9	92,9
Al <sub>2</sub> O <sub>3</sub>	-	-	-	-
CaO	2,0	2,1	3	2,2
SiO <sub>2</sub>	6,1	0,2	3	3,3
C	-	-	-	-
Max service temperature °C	1.750	1.750	1.750	1.750
Grain size max (mm)	0,3	0,2	0,2	0,2
BONDING STRENGTH AFTER HEATING				
24 h at 110°C	30	150	50	50
5 h at 1.000°C	40	-	-	-
5 h at 1.400°C	170	-	-	-
Water required %	34	-	20	20
Retentive time (hours)	1	-	1	1
Characteristics	Air setting	chemical-organic setting	Air setting	Air setting

## REGULAR CASTABLES

REGULAR CASTABLES					
PRODUCT	MAGCAST				
	741BM	30SP	97ECO	196P	95K
UNI EN classification 14:02	DENSE CASTABLE				
Main product	Magnesia				
CHEMICAL ANALYSIS (ON RAW MATERIALS OXIDES)					
MgO	80,80	80,00	89,80	90,20	94,70
Cr <sub>2</sub> O <sub>3</sub>	14,60	-	5,40	5,20	-
CaO	1,60	1,60	1,90	0,70	2,10
SiO <sub>2</sub>	1,00	1,50	0,30	0,10	2,30
Fe <sub>2</sub> O <sub>3</sub>	0,40	0,40	0,10	0,50	0,10
Max service temperature °C	1750	1750	1750	1750	1750
Bulk density (t/m <sup>3</sup> )	2,80	2,80	2,81	2,90	2,89
PERMANENT LINEAR CHANGE (%) AFTER HEATING					
24 h at 110°C	-	-	-	-	-
5 h at max service temperature	0,5	0,7	- 0,5	+/- 0,05	-1,2
BULK DENSITY (G/CM <sup>3</sup> ) AFTER HEATING					
24 h at 110°C	2,85	2,85	2,81	2,94	2,86
5 h at max service temperature	2,90	2,92	2,89	2,93	3,05
COLD CRUSHING STRENGTH (KG/CM <sup>2</sup> )					
24 h at 110°C	500	500	500	700	500
5 h at max service temperature	700	700	600	350	600
MODULUS OF RUPTURE (KG/CM <sup>2</sup> ) AFTER HEATING					
24 h a 110°C	60	620	60	50	60
5 h at max service temperature	80	80	80	25	200

PRODUCT	MAGCAST				
	741BM	30SP	97ECO	196P	95K
UNI EN classification 14:02	DENSE CASTABLE				
Main product	Magnesia				
Water required (%)	8,0	8,0	8,5	5,5 ÷ 6,0	5,0
Application Method	Casting	Casting	Casting	Casting	Casting
THERMAL CONDUCTIVITY (W/MK)					
at 500 °C	2,8	2,9	3,1	3,4	3,6
at 1.000 °C	2,1	2,1	2,3	2,4	2,6

### RAMMING MASSES

PRODUCT	MAGRAM 97 PR	MAGRAM 97 PRE	MAGRAM 99 PR
UNI EN classification 14:02	CHEMICAL BONDED RAMMING MATERIALS		
Component	Magnesite		
CHEMICAL ANALYSIS (ON RAW MATERIALS OXIDES)			
MgO	93,6	93,7	94,0
Al <sub>2</sub> O <sub>3</sub>			0,1
CaO	2,2	2,2	2,1
SiO <sub>2</sub>	0,4	0,3	3,4
Fe <sub>2</sub> O <sub>3</sub>	-	-	0,1
Fixed carbon (%)	5	5,0	4
Max service temperature °C	1750	1750	1750
Quantity required (t/m <sup>3</sup> )	2,7	2,7	2,72
Grain size max (mm)	5	5	5
Characteristics	ready	ready	ready
Installation method	Ramming	Ramming	Ramming

### GUNNING MASSES

PRODUCT	MAGGUN					
	92 P	926	89 L 5	913	850FR	89COV
Main product						
CHEMICAL ANALYSIS (ON RAW MATERIALS OXIDES)						
MgO	91,30	87,10	89,50	91,10	86,00	85,70
Al <sub>2</sub> O <sub>3</sub>	0,70	1,00	-	-	1,00	1,00
CaO	3,30	3,40	2,50	3,60	3,30	3,30
SiO <sub>2</sub>	1,30	4,10	6,00	1,50	5,20	7,60
Fe <sub>2</sub> O <sub>3</sub>	0,10	1,20	1,00	0,10	-	-
P205	2,10	2,10	-	1,80	-	-
C	-	-	-	-	-	-
C	4	3		3	4	3
Grain size max (mm massima (mm))	1.750	1.750	1.750	1.750	1.750	1.750
Max service temperature °C	2,50	2,40	2,40	2,50	2,40	2,4
Quantity required (t/m <sup>3</sup> )	-	-	-	-	-	-
24 h at 110°C	2,60	2,50	2,50	2,60	2,40	2,60
Gunning method	dry	dry	dry	dry	dry	dry
Water required %	8 ÷ 12	10	10	10 ÷ 12	8 ÷ 10	10

## High-grade Refractories

### TAP HOLE BLOCKS AND RINGS

Code	Dimensions (mm)			Volume (dm <sup>3</sup> )
	L	H	$\Phi_i$	
Q55-15D30	550	150	300	34,8
Q55-15D40	550	150	400	26,5
Q55-20D40	550	200	400	35,4
V35-Y D X	350	Y= 75 ÷ 175	X= 120 ÷ 200	-





### TAP HOLE BLOCKS

PRODUCT	CHEMICAL ANALYSIS ON RAW MATERIALS OXIDES				PHYSICAL PROPERTIES					THERMAL CONDUCTIVITY	
	MgO	CaO	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	C	B.D.	A.P.	C.C.S.	M.R.	at 500°C	at 1.000°C
	%	%	%	%	% fixed	gr/cm <sup>3</sup>	gr/cm <sup>2</sup>	gr/cm <sup>2</sup>	Kg/cm <sup>2</sup>	W/mK	
LCPB99E50	98,0	1,1	0,35	0,4	5,5	3,06	5,0	300	70	4,76	3,94
LCPB99E50 X	97,85	1,1	0,35	0,3	6,5	3,15	4	350	80	6,38	4,87

### RINGS

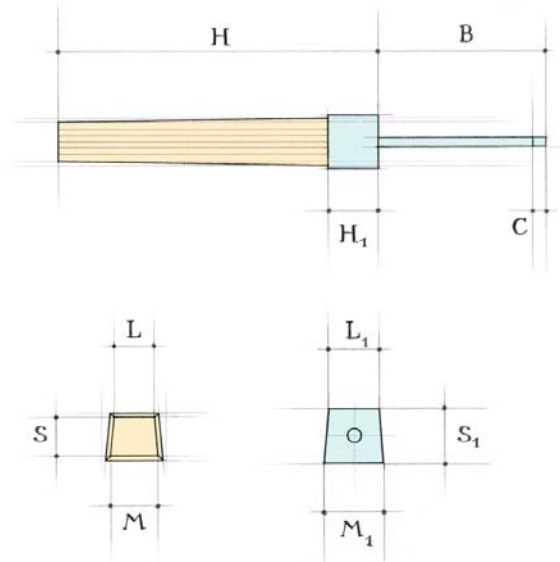
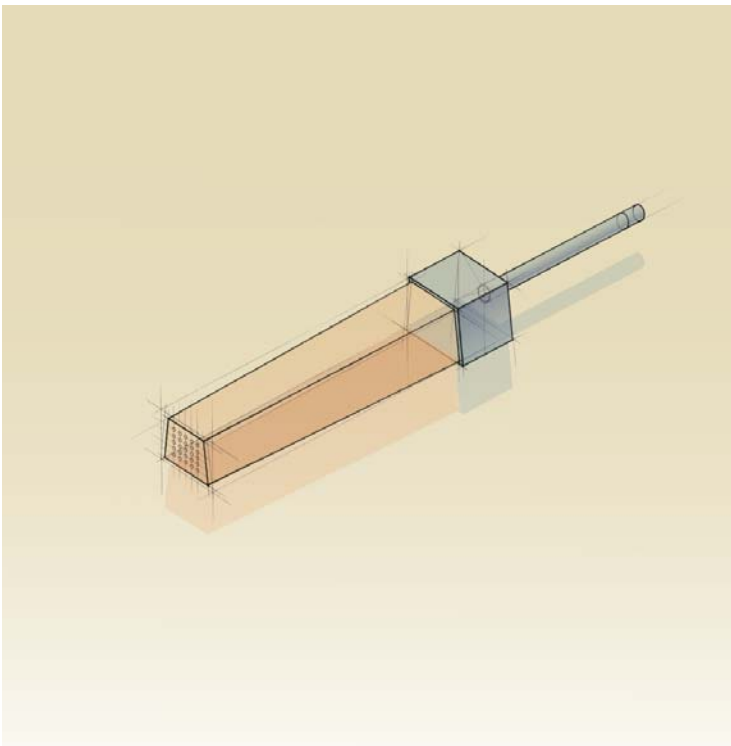
PRODUCT	CHEMICAL ANALYSIS ON RAW MATERIALS OXIDES				PHYSICAL PROPERTIES					THERMAL CONDUCTIVITY	
	MgO	CaO	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	C	B.D.	A.P.	C.C.S.	M.R.	at 500°C	at 1.000°C
	%	%	%	%	% fixed	gr/cm <sup>3</sup>	gr/cm <sup>2</sup>	gr/cm <sup>2</sup>	Kg/cm <sup>2</sup>	W/mK	
CP14E45RSS	97,30	1,75	0,35	0,30	14,0	2,95	5,0	300	70	13,4	10,5
CP050PS	97,30	1,75	0,35	0,30	14,0	2,87	5,0	350	80	13,4	10,5
CP116V	97,50	1,45	0,45	0,35	10,0	3,03	3,0	350	100	11,4	8,4
CP241	98,50	0,90	0,20	0,25	15,0	2,93	5,0	250	55	14,8	11,6
CP14E45RSS X	97,30	1,75	0,35	0,30	15,00	2,99	1,0	450	100	14,70	11,6
CP050PS X	97,30	1,75	0,35	0,30	15,50	2,96	1,0	450	100	15,10	11,7
CP116V X	97,50	1,45	0,45	0,35	12,00	3,11	1,0	450	100	12,20	9,3
CP241 X	98,50	0,90	0,20	0,25	16,00	3,01	1,0	450	100	15,70	11,9
LCP201TE	97,70	1,15	0,40	0,50	5,00	3,02	5,0	350	90	3,80	3,0
LCP201TE X	97,70	1,15	0,40	0,50	6,50	3,04	1,0	450	100	5,50	4,2

# Purging Plugs

## TPC

Code	Dimensions (mm)										Small pipes number
	H	H1	S	S1	L	L1	M	M1	B	C	
TPC 85 C2-TA2	800	100	127,2	145	130	148	147	167	580	50	25
TPC 15 C-TA12L	1020	100	108	130,5	129,5	154	144	171,5	610	180	25
TPC 91 TOXE	900	100	146	154	100	100	-	-	300	30	16
TPS 100 RAU	1000	170	140	160	100	100	-	-	350	45	25
TPC 102 EKS	1020	100	110	130,5	106,6	127,1	117,6	140	500	50	25
TPC 102 EKS/M	1020	100	110	130,5	106,6	127,1	117,6	140	500	50	25
TPC 100/20-H	1020	100	140	160	100	100	-	-	500	-	20
TPC 10568	1050	80	110	130	105,1	124,26	118,41	140	500	30	25
TPC 90 PIO	900	100	105	125	117,5	137,5	129	151,5	610	30	25

PRODUCT	CHEMICAL ANALYSIS ON RAW MATERIALS OXIDES				PHYSICAL PROPERTIES					THERMAL CONDUCTIVITY	
	MgO	CaO	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	C	B.D.	A.P.	C.C.S.	M.R.	at 500°C	at 1.000°C
	%	%	%	%	% fixed	gr/cm <sup>3</sup>	gr/cm <sup>2</sup>	gr/cm <sup>2</sup>	Kg/cm <sup>2</sup>	W/mK	
BB1-14E45RSS	97,25	1,90	0,30	0,20	13,5	2,93	5	300	70	13,11	10,9
BB2-14E45RSS	97,25	1,90	0,30	0,20	14,0	2,93	5	300	70	13,4	10,4
BB2-CP096B	97,30	1,85	0,30	0,20	14,5	2,91	5	350	100	13,9	10,9
BB2-CP050PS	97,00	1,75	0,35	0,40	14,00	2,87	5,00	350,00	80,00	13,30	10,40



## Post-impregnated bricks

All wear lining bricks, as well as special pieces, can be supplied pitch post-impregnated.

Post-impregnation is a hot process under vacuum aimed at filling bricks porosity by pitch in order to transform, practically, a resin bonded brick into a pitch bonded one thus increasing its chemical and mechanical properties.

Post-impregnated product are recognizable by suffix "X" to the brand name.

Sanac has two post-impregnation equipments located in Massa plant.



**SANAC**

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