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Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06

Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81

Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
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Россия (495)268-04-70

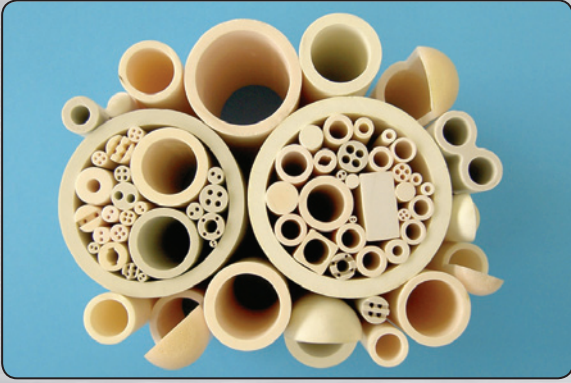
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Санкт-Петербург (812)309-46-40
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Казахстан (772)734-952-31

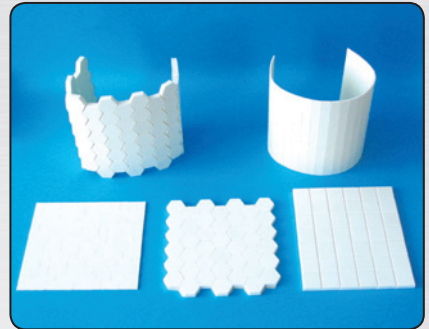
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Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

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Каталог продукции компании **AVTO G**



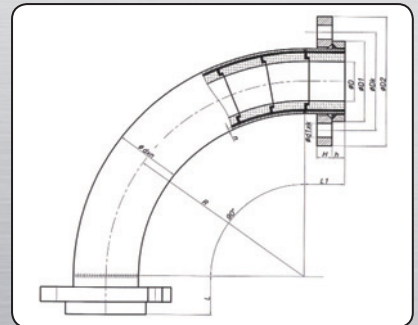
Ceramic tubes and isolators for thermo elements; Material: C 530, C 610, C 795, C 799



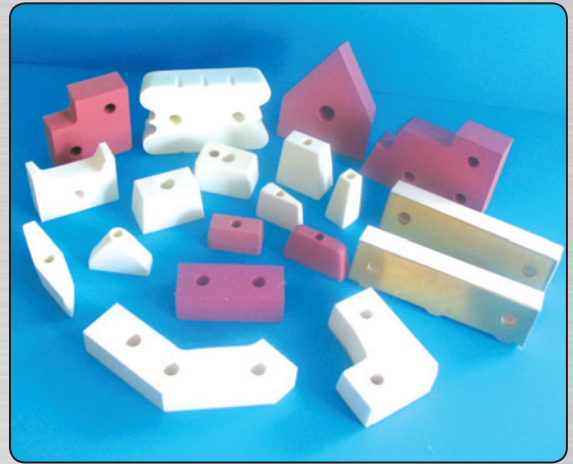
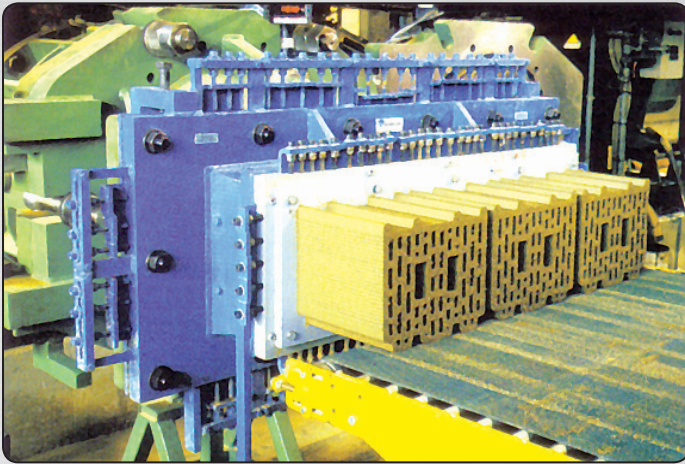
Ceramic for mill lining, elements for milling and mozaics



Ceramic seals and pistons for water pumps



Tubes and elbows with ceramic lining for hydraulic and pneumatic transport of very abrasive materials



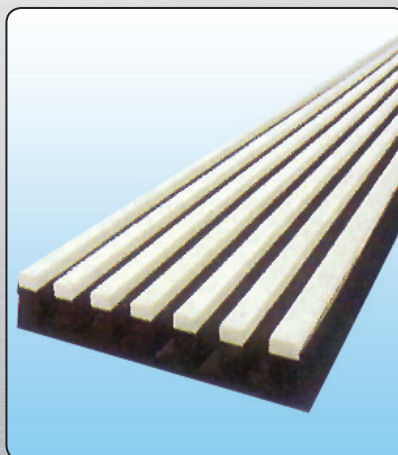
Ceramic tools for brick extruding



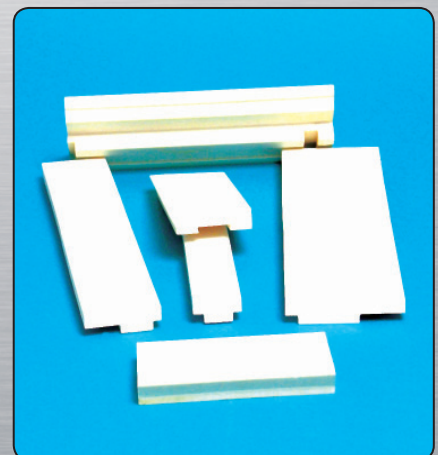
Ceramic for wire and textile production



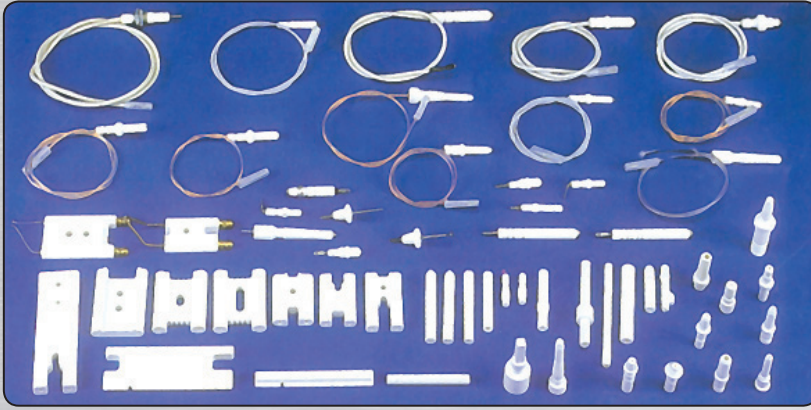
Centrifugal cleaners



Ceramic segments for dewatering foils



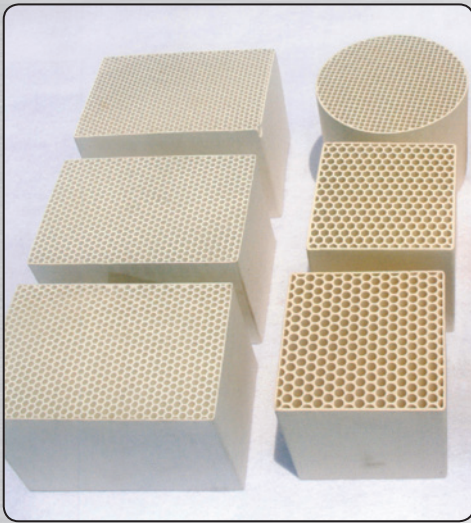
Components for paper industry



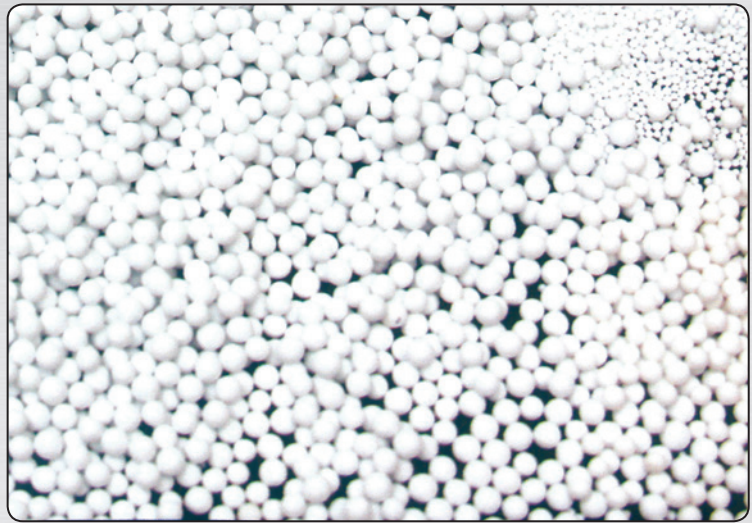
Ignition electrodes for gas and oil equipment



Insulators for ignition electrodes



Ceramic honeycomb filters



Catalyst supporting balls

Heat exchanging elements



Insulator for spark plugs



Copper cored electrodes for spark plugs

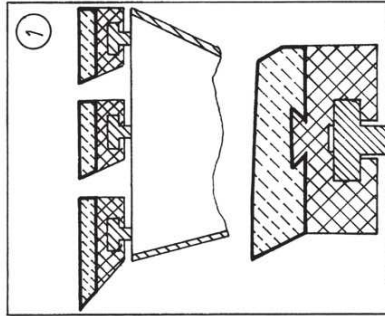
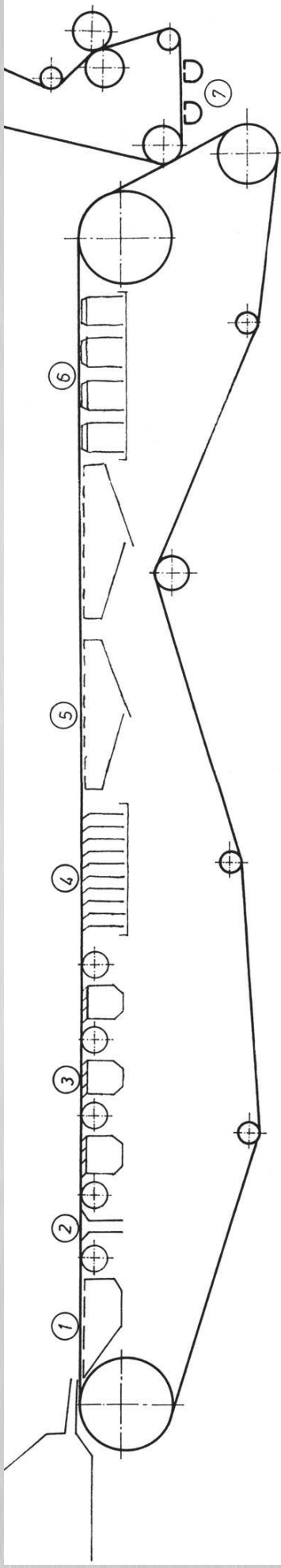


Components for spark plugs



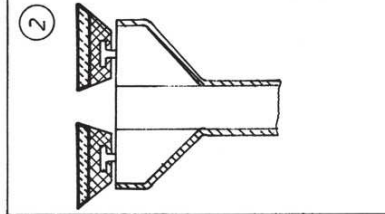
// CERAMIC IN PAPER INDUSTRY

// CERAMIC DEWATERING ELEMENTS FOR PAPER MACHINES AND CONES FOR PAPER INDUSTRY



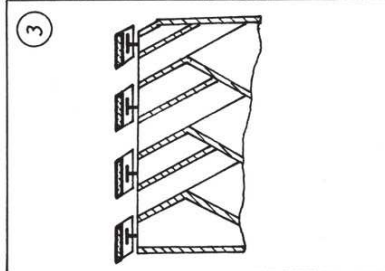
FORMING BOARD

This zone, being exposed to the most severe load conditions, requires extreme wear resistance as well as high-quality finish. By fitting the ceramic foils of high-quality ceramics we get such working elements that maintain their geometry for several years, what is very important for regulation and proper functioning of the machine.



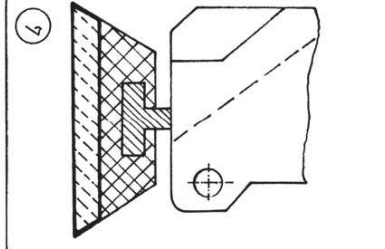
DEFLECTORS

Such design of the foil supports guarantees uniform wire level, efficient direction of the splashy water jet from dewatering rolls, with additional effect of dewatering the deflectors themselves.



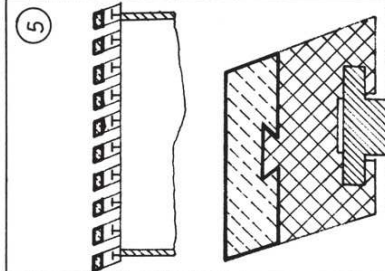
DEWATERING FOILS

With appropriate arrangement and geometrically fully defined working areas, dewatering foils may bring the dewatering diagram close to that theoretically required, while a high wear resistance of ceramic elements insures keeping the given parameters even for several years what, of course, justifies their use. Reduced coefficient of friction, extended wire life, possibility of higher operating speeds, unnecessary adjustments and minimized maintenance requirements are direct elements of production economy.



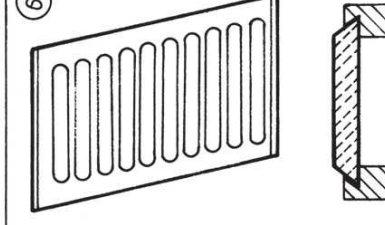
WET SUCTION BOXES

For a good and controlled dewatering an appropriate design of wet suction boxes is of great importance. Design with approx. 50% of open areas with ceramic lined foils (supports) gives the best results. Unchangeable smooth sliding surfaces insure high production economy.



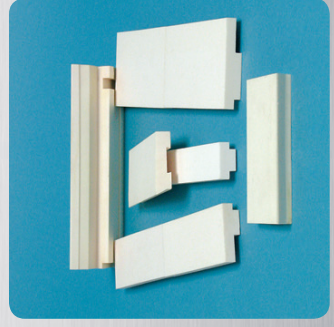
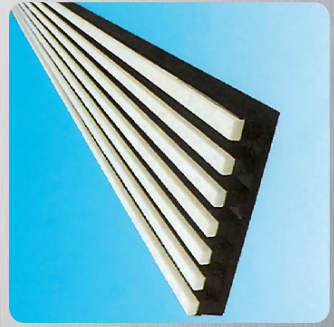
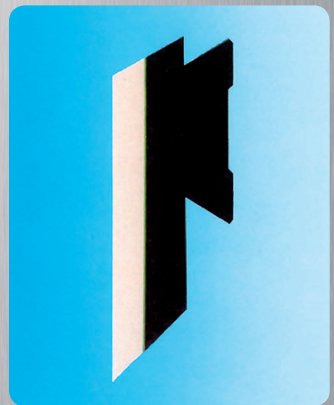
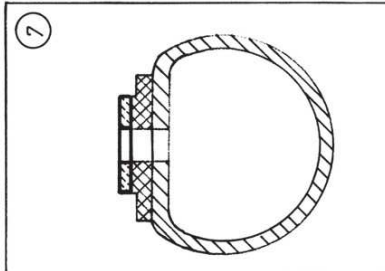
FLAT SUCTION BOXES

Mechanical characteristics of ceramic foils, geometry of working area holes, and arrangement of the boxes on the machine have decisive effects on the productivity, working area (wire foil) lifetime and paper quality. We can say that a design with high-quality ceramic foils is technically undchangeable.



FELT CLEANING SUCTION BOXES

Ceramic foils on the tube-like suction boxes, having smooth surfaces, function properly even for several years without any defects and with negligible felt wear.



MATERIALS

Materials that are used for production of ceramic elements for paper industry:

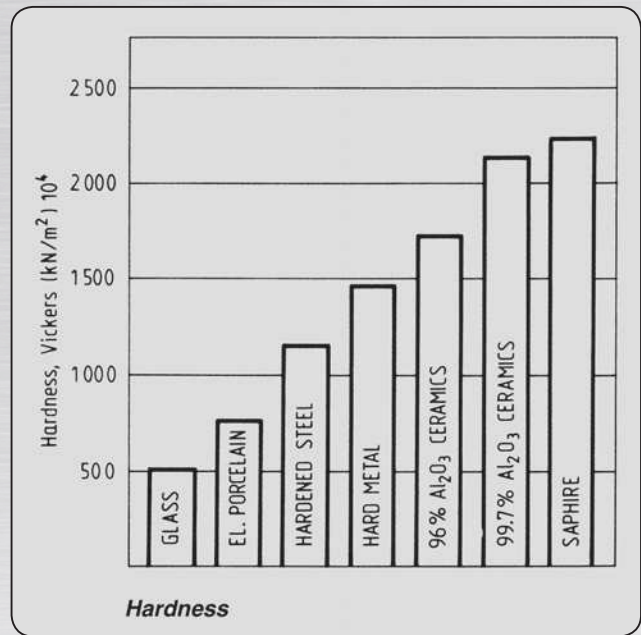
- Alumina Oxide 95% Al_2O_3
- Alumina Oxide 99,7% Al_2O_3
- Composite $\text{Al}_2\text{O}_3 + 10\% \text{ZrO}_2$ (Alumina Oxide + Zirconum Oxide)
- Zirconum Oxide ZrO_2

MECHANICAL PROPERTIES

The widest application of ceramics comes from its excellent mechanical properties.

High hardness and wear resistance, modulus of elasticity, comprehensive and flexural strengths have enabled the application of ceramic parts there where high mechanical stresses are experienced.

Such high strength of ceramics is maintained at high temperatures, what makes it an excellent replacement for majority of metals, glasses, plastics, etc.





Technology of isostatic pressing allows us to produce high quality insulators for spark plugs. We offer all kind of insulators, with or without glaze, with or without mark of the spark plug type, according to customers request. Material is high quality ceramic 95% Al₂O₃.

COPPER CORED ELECTRODES

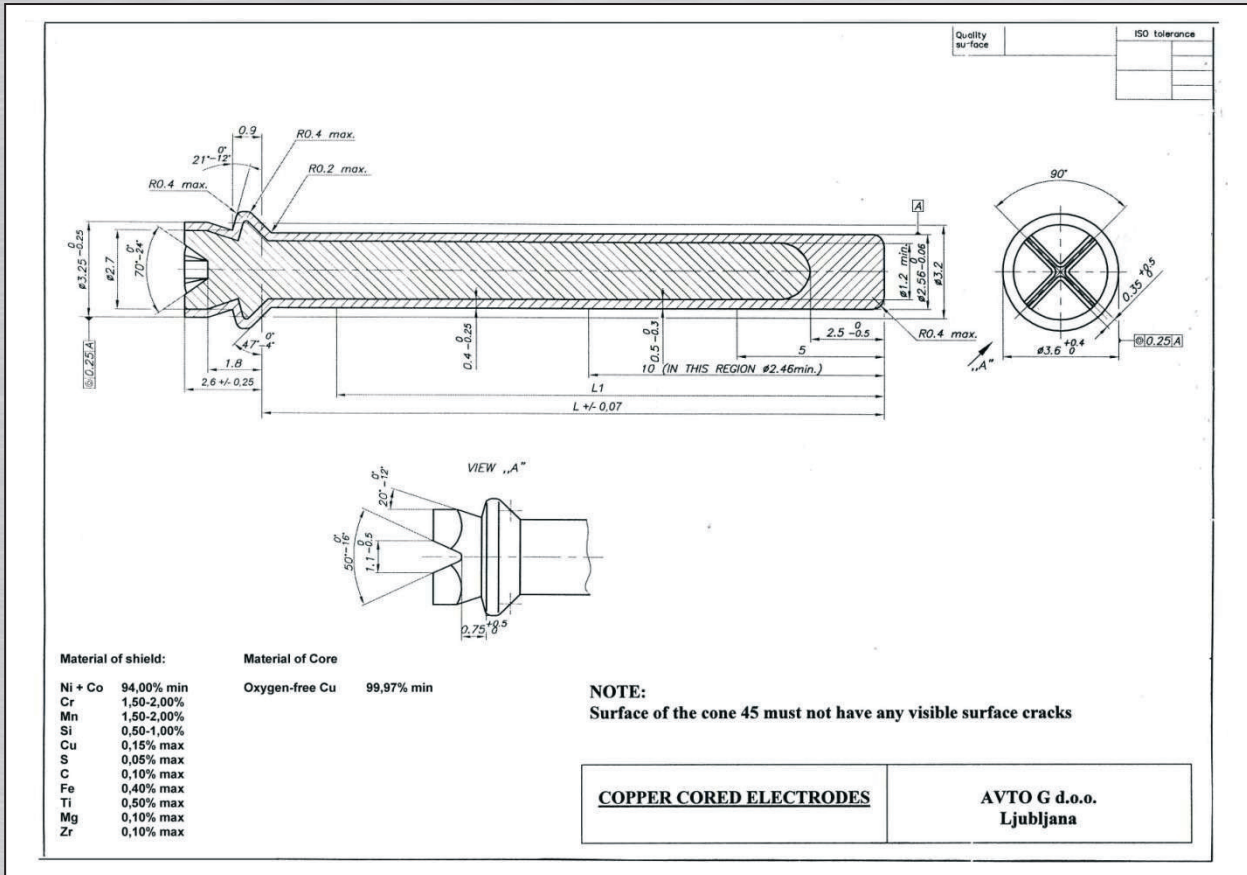


Our speciality are all kind of copper cored electrodes for spark plugs. Our electrodes have very good quality and wide range of different dimensions. In our production program we have all diameters and lengths and we also offer copper cored electrodes made of two different materials of Nickel cover.

// COPPER CORED ELECTRODES

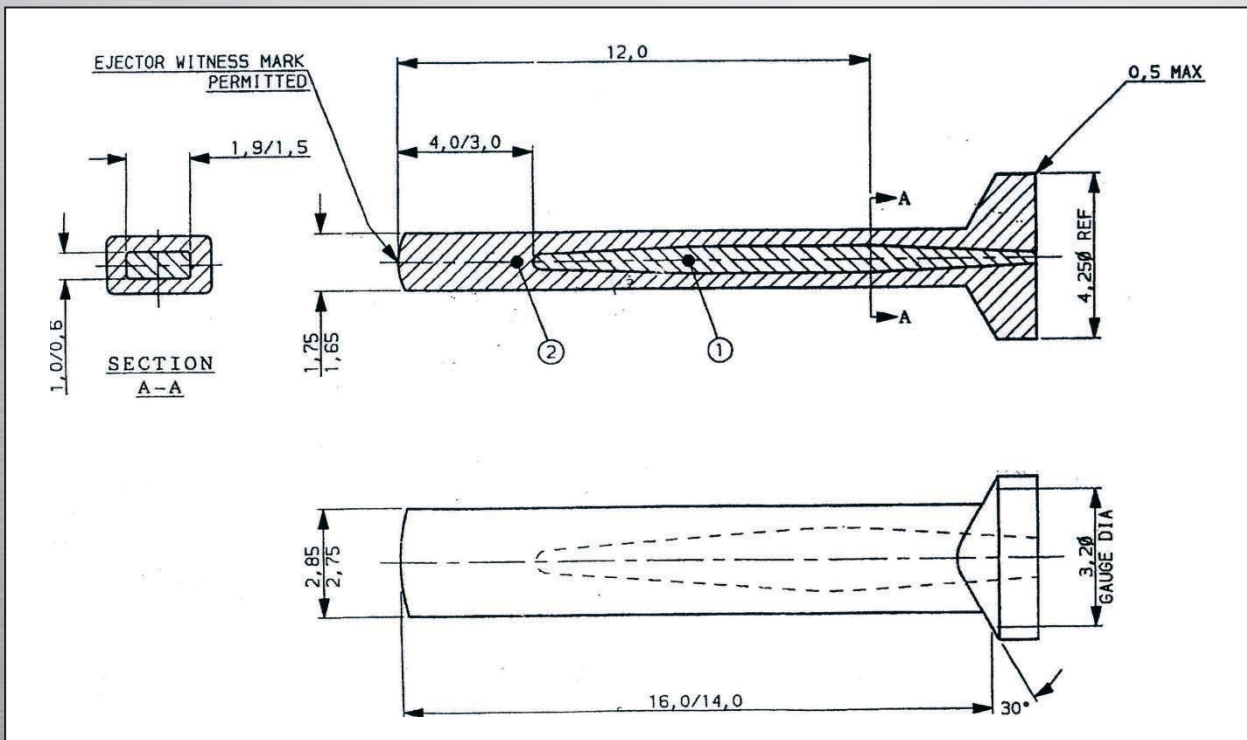
// COPPER CORED ELECTRODES AND INSULATORS

A - COPPER CORED CENTRAL ELECTRODE



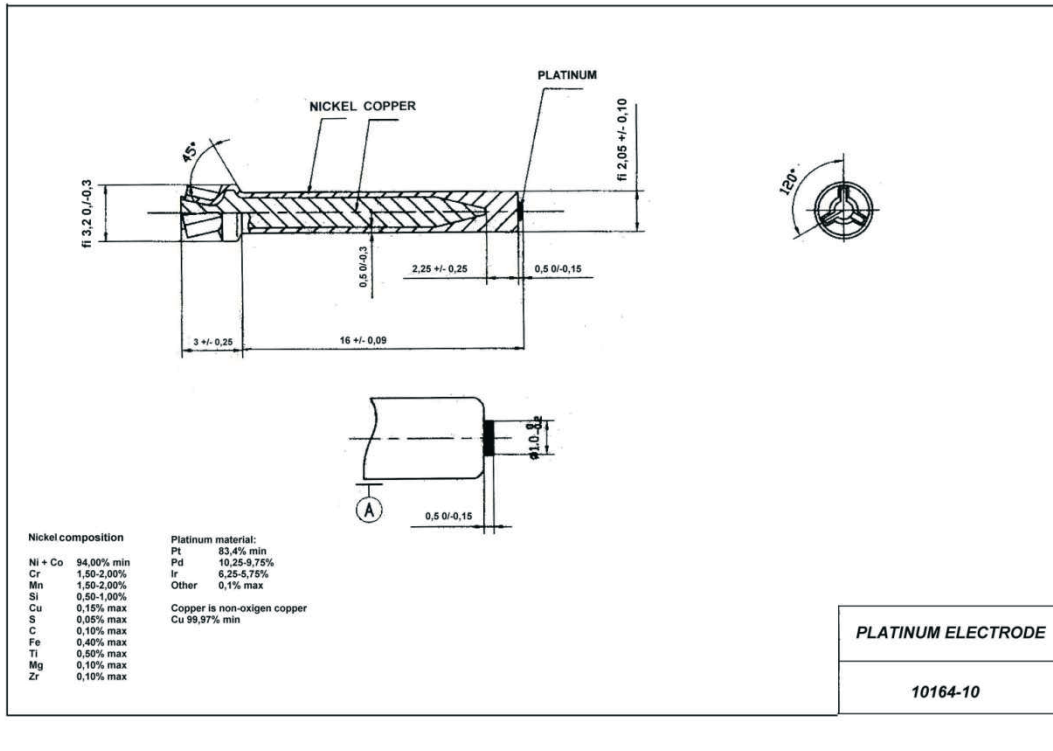
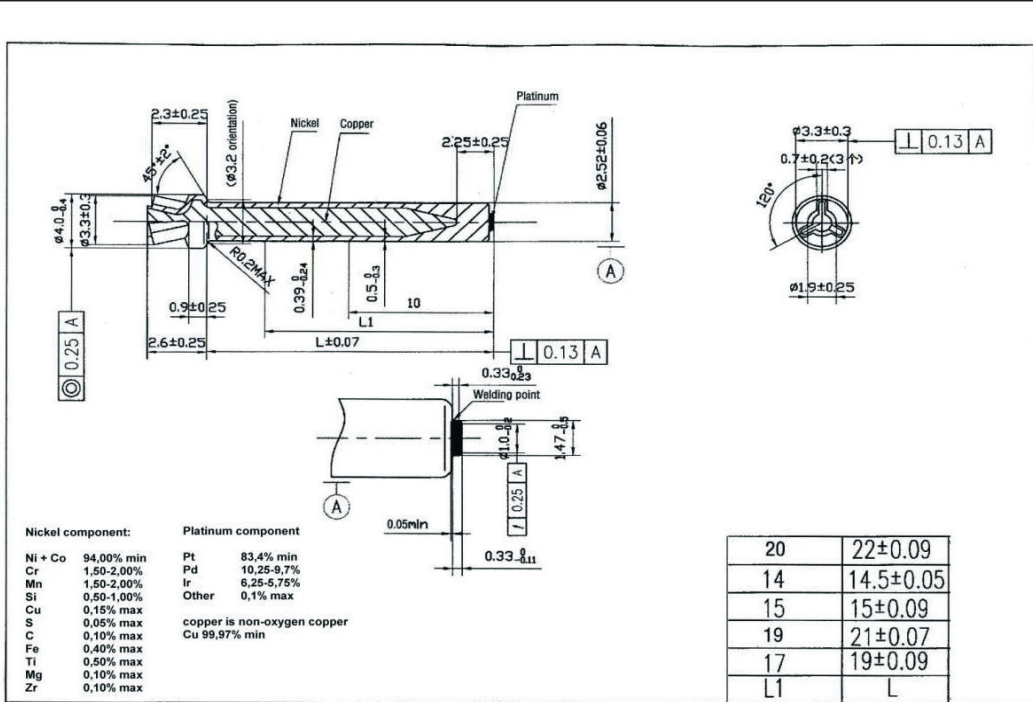
B - COPPER CORED SIDE ELECTRODE

Beside central copper cored electrodes we also offer side copper cored electrodes. Material of those electrodes is same as material for central copper cored electrodes. Here on drawing is given one type of side copper cored electrodes. We can also make other types, according to customer's request.



C – PLATINUM CENTRAL ELECTRODES

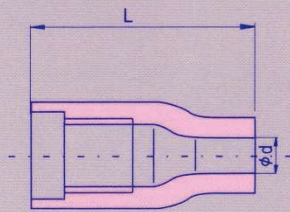
For spark plugs that have long life term, we have copper cored electrode with platinum component. Platinum on electrodes provide to spark plug producers long term product which they can offer on market. On drawings you can see some types of platinum electrodes. We can also make other types, according to customer's request.



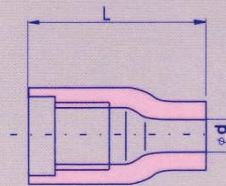


// NOZZLES

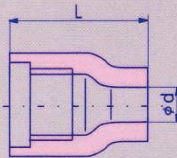
// NOZZLES FOR WELDING, SAND BLASTING AND DISPERSION



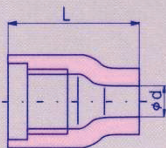
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-/-	8	42	2.10.01	54N17
-/-	9,5	42	2.10.02	54N16
-/-	11	42	2.10.03	54N15
-/-	12,7	42	2.10.04	54N14
-/-	15,8	42	2.10.05	
-/-	19	42	2.10.06	54N19
-/-	17,5	42	2.10.07	
-/-	8	42	2.10.08	54N17L
-/-	9,5	42	2.10.09	54N16L
-/-	11	42	2.10.10	54N15L



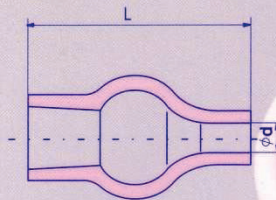
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			AVTO G	INTERNATIONAL
M20x1.5	6	42	2.12.00	
-/-	9	38	2.12.01	
-/-	11	38	2.12.02	
-/-	13	38	2.12.03	
-/-	6	50	2.12.04	
-/-	9	50	2.12.05	



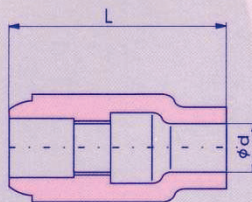
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			AVTO G	INTERNATIONAL
9/16"-20UNF	6,5	25	2.13.00	53N58
-/-	8	25	2.13.01	53N59
-/-	9,5	25	2.13.02	53N60
-/-	11	25	2.13.03	53N61
-/-	12,5	25	2.13.04	53N62



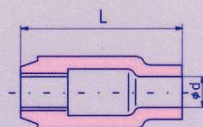
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7/16"-20UNF	4	16,5	2.14.00	53N23
-/-	6,5	16,5	2.14.01	53N24
-/-	8	16,5	2.14.02	53N25
-/-	9,5	16,5	2.14.03	53N27



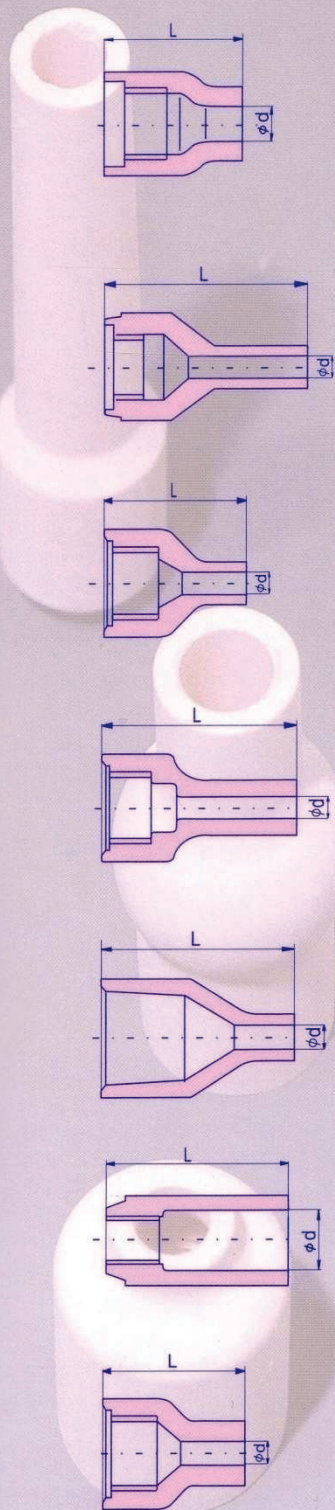
KONUS CONICAL	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
1:10	6,5	44	2.18.00	130.00
-/-	8	44	2.18.01	131.00
-/-	9,5	44	2.18.02	132.00
-/-	11	44	2.18.03	133.00
-/-	12,5	44	2.18.04	134.00
-/-	14,3	44	2.18.05	135.00
-/-	16	44	2.18.06	136.00
-/-	18	44	2.18.07	137.00



NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
13/32"-16UNF	6,5	47	2.11.00	10N50
-/-	8	47	2.11.01	10N49
-/-	9,5	47	2.11.02	10N48
-/-	11	47	2.11.03	10N47
-/-	12,7	47	2.11.04	10N46
-/-	11	76	2.11.05	10N47L
-/-	12,7	76	2.11.06	10N46L
-/-	15,8	47	2.11.07	10N45
-/-	19	47	2.11.08	10N44
-/-	8	76	2.11.09	10N49L
-/-	9,5	76	2.11.10	10N48L



NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
3/8"-24UNF	6,5	29,5	2.15.06	13N08
-/-	8	29,5	2.15.07	13N09



NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
1"-16UNF	9,5	48	2.21.00	53N85
-/-	12,5	48	2.21.01	53N86
-/-	16	48	2.21.02	53N87
-/-	19	48	2.21.03	53N88
-/-	25,5	48	2.21.04	53N89

NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
3/8"-24UNF	6,5	48	2.16.00	796F71
-/-	8	48	2.16.01	796F72
-/-	9,5	48	2.16.02	796F73
-/-	6,5	63	2.16.04	796F74
-/-	8	63	2.16.05	796F75
-/-	6,5	89	2.16.05	786F76
-/-	8	89	2.16.06	796F77

NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
3/4"-16UNF	6,5	32	2.17.00	14N57
-/-	8	32	2.17.01	14N58
-/-	9,5	32	2.17.02	14N59
-/-	11	32	2.17.03	14N60
-/-	12,5	32	2.17.04	14N61

NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
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-/-	8	65	2.19.01	105Z..
-/-	9,5	65	2.19.02	105Z..
-/-	11	65	2.19.03	105Z..
-/-	12,5	65	2.19.04	105Z..

KONUS CONICAL	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
1:10	8	54	2.20.00	141-00
-/-	9,5	54	2.20.01	142-00
-/-	11	54	2.20.02	143-00
-/-	12,5	54	2.20.03	144-00
-/-	16	54	2.20.04	145-00

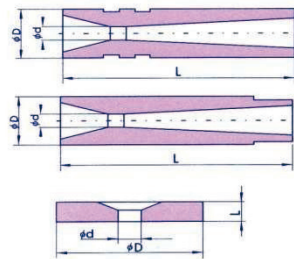
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-/-	11	29,5	2.15.01	13N11
-/-	12,5	29,5	2.15.02	13N12
-/-	16	29,5	2.15.03	13N13

NAVOJ THREAD	d	L	IDENT.BR. IDENT.No.	
			AVTO G	INTERNATIONAL
M16X1.5	7	32	2.22.00	
-/-	9	32	2.22.01	
-/-	11	32	2.22.02	

Aluminij oksidna keramika namjenski razvijena za izradu dizni za zavarivanje odlikuje se visokom temperaturnom i elektro izolacionom otpornošću. Proizvodimo široku lepezu standardnih tipova (ili posebnih prema zahtjevu) sa navojnim ili konusnim priključcima za MIG / MAG i WIG / TIG brenere.

Aluminium-oxide ceramics was develop for specific purpouses for manufacturing welding nozzles and it is characterized by high temperature resistance and electric insulating resistance.

We produce a range of standard types (or spcific ones according to request) with threader or coned connecting parts for MIG / MAG and WIG / TIG burners.

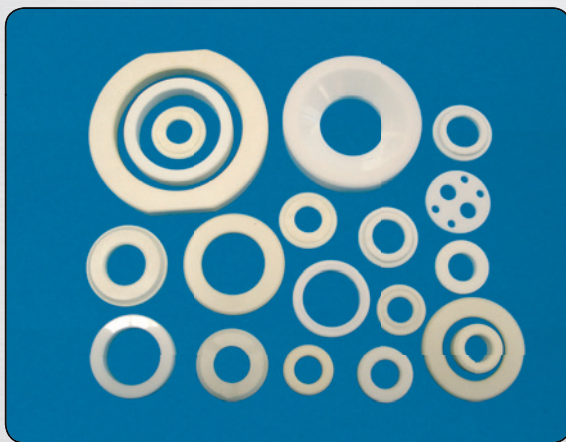
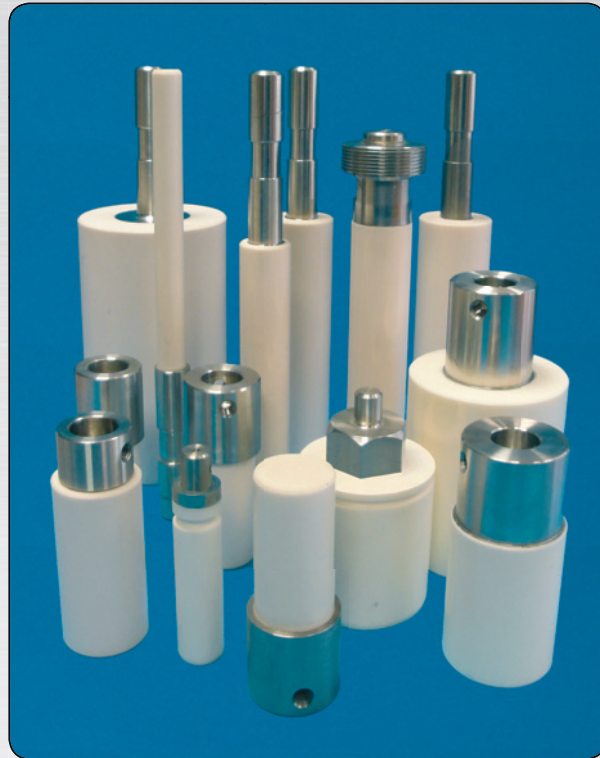


D	d	L
22	6	90
22	8	90
22	10	90

D	d	L
20	6	80
20	7	80
20	8	80

D	d	L
19	0,5	3
19	1	3
19	1,5	3

Nozzles for sand blasting and dispersion are produced of aluminium-oxide ceramics or composites consisted of aluminium-oxide and chrome-oxide which have very high hardness and wear resistance. WE PRODUCED ALSO THE OTHER NOZZLE FORMS IN ACCORDANCE



// CERAMIC PISTONS, SEALS AND BALLS

- // CERAMIC BALLS AND SEATS FOR VALVES
- // CERAMIC PISTONS FOR WATER PUMPS
- // CERAMIC SEALS FOR WATER PUMPS



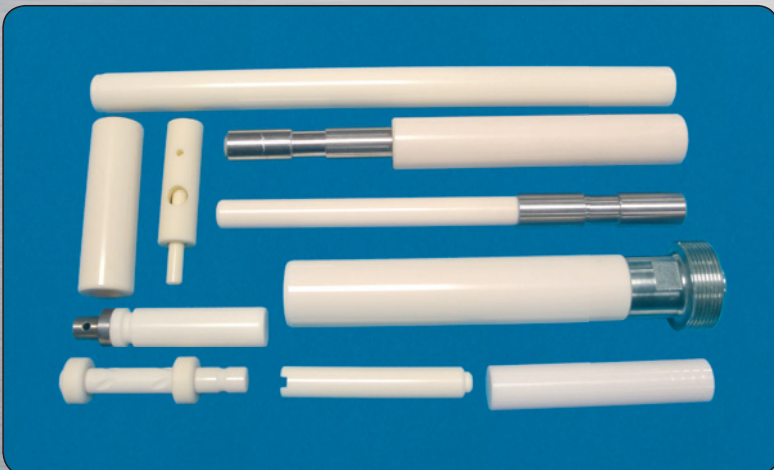
PISTONS AND SHAFTS

We can produce different shapes and sizes. It is produced from ceramic materials: aluminium oxide, 95% Al_2O_3 ; 99,7% Al_2O_3 or from zirconium oxide $\text{ZrO}_2 + \text{Y}_2\text{O}_3$;
We can achieve surface quality up to $\text{Ra} \leq 0,2 \mu\text{m}$.



BIG PLUNGERS

We are producing plungers with big diameters and different lengths from ceramic materials: aluminium oxide, 95% Al_2O_3 ; 99,7% Al_2O_3 or from zirconium oxide, $\text{ZrO}_2 + \text{Y}_2\text{O}_3$, with very fine quality surface up to $\text{Ra} \leq 0,2 \mu\text{m}$.

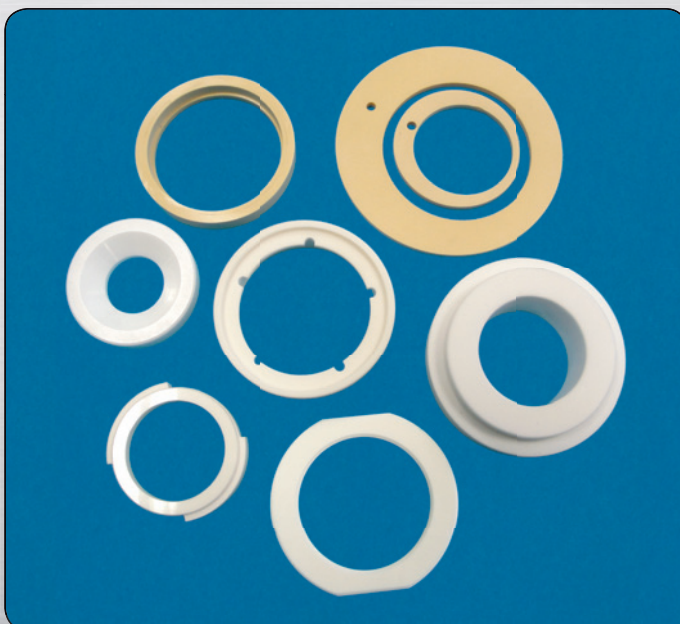
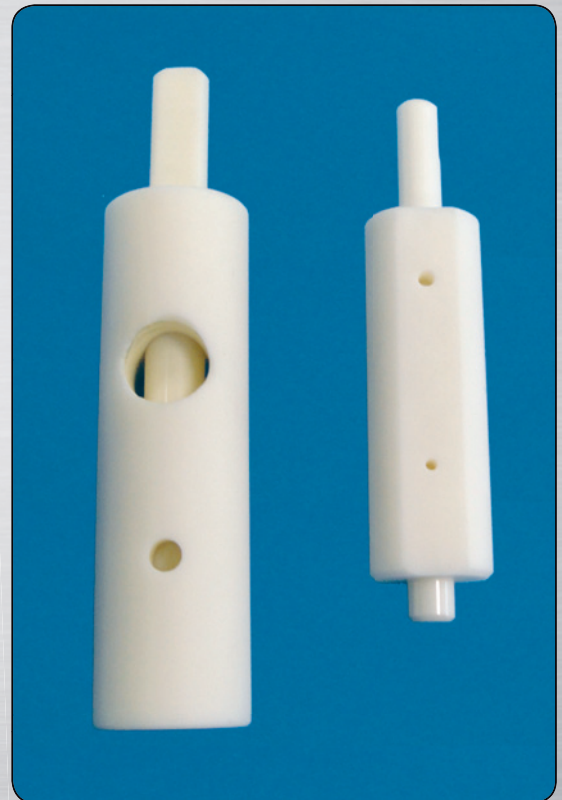


All plungers can be made in combination with metal. We have our own method to connect metal to ceramics, but we can also produce according to the customers drawing. Metal quality is stainless steel or it can be according to customers request.



According to the drawing or samples from customer we can produce all kind of axial bearing with very finely treated surface up to $Ra \leq 0,2 \mu m$. Material can be: aluminium oxide, 95% Al_2O_3 ; 99,7% Al_2O_3 ; zirconium oxide, $ZrO_2 + Y_2O_3$ or $ZrO_2 + MgO$;

With our production technology, we can produce very demanding sets of cylinders and plungers or ceramic pumps, with high level of outside and inside surface quality and very small tolerances.



The production of axial bearings with big dimensions according to customers request. The material is based on ceramics aluminium oxide, Al_2O_3 and zirconium oxide, ZrO_2 .



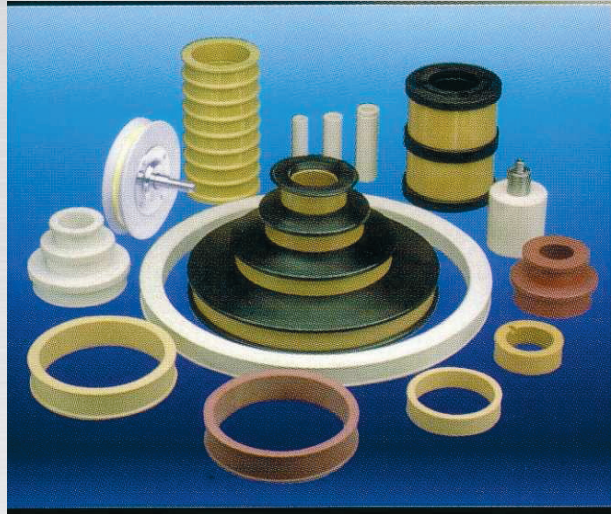
BALLS AND VALVE SEATS

Balls and valve seats are made from ceramic material aluminium oxide, 99,7 % Al_2O_3 or from zirconium oxide, $\text{ZrO}_2 + \text{Y}_2\text{O}_3$.

Surface treatment meets high demands in valve industry.

For very aggressive media, we produce ball valves, valve seats, plungers, shafts and sticks from ceramic material zirconium oxide $\text{ZrO}_2 + \text{Y}_2\text{O}_3$. High degree of surface treatment suits very strict standards, that apply to this kind of products.



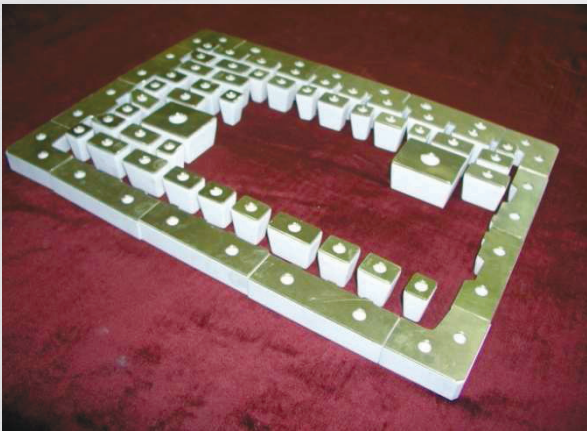
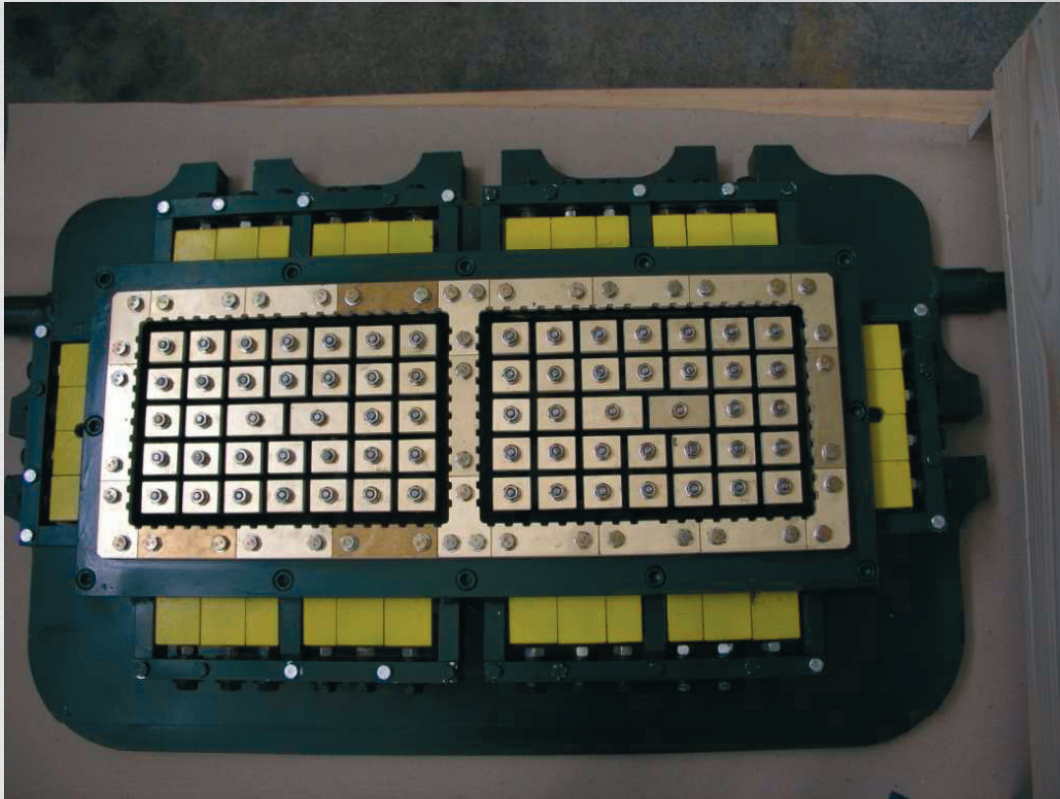


We make all kind of cones and rings for reducing the wire from very quality material as:
95% Al₂O₃, 99,7% Al₂O₃, ZrO₂ and composite Al₂O₃ + 2% Cr₂O₃



We also make all kind of ceramic parts for textile industry from materials:
95% Al₂O₃, 99,7 Al₂O₃ and composite Al₂O₃ + 2% Cr₂O₃

// CERAMIC FOR WIRE AND
TEXTILE PRODUCTION



// EXTRUDING TOOLS

// EXTRUDING TOOLS FOR BRICK



Most exposed parts (to wear) of extruding tools are made of ceramic:

- Standard 96% Al₂O₃
- Composite with chrom-oxide for heavy working conditions
- Other better materials based on Al₂O₃ according to customers request

Frame plates and cores are grinded after sintering. With that technology we achieve high precision in thickness of walls.

Frames and cores are also protected with metal plates 2 mm thick in order to protect from damaging during manipulation with tool.

Frame plates are made 20 or 30 mm thick, or according to the customer request.



Ceramic wear parts have the following characteristic:

- Life time is 5 times longer in comparison to metal parts
- Hardness is about 80 Hrc (tempered steel max. 65 Hrc)
- Very small abrasion resistance and because of that you can save electrical energy and get better quality
- Long retention of thickness of walls and weight of bricks and result is saving clay and energy (fuel)

Metal parts are made of high alloyed steel that are thermally processed or »Hardox«.

A part of metal elements is hard chromed according to special requests with the aim to achieve life time of core holders.

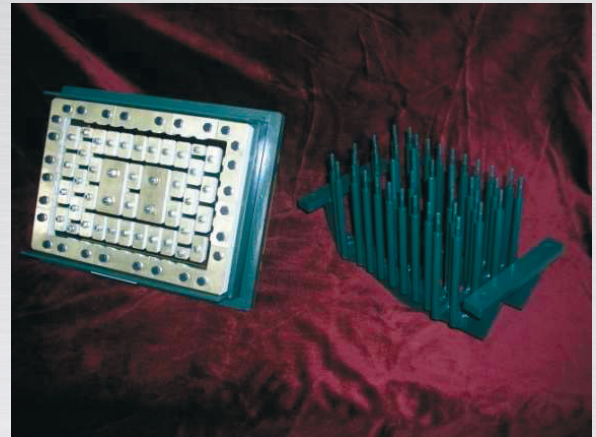




Extrusion tools are produced with inner and external brakes for flow of clay.

According to the special orders, we make parts of extrusion tools as:

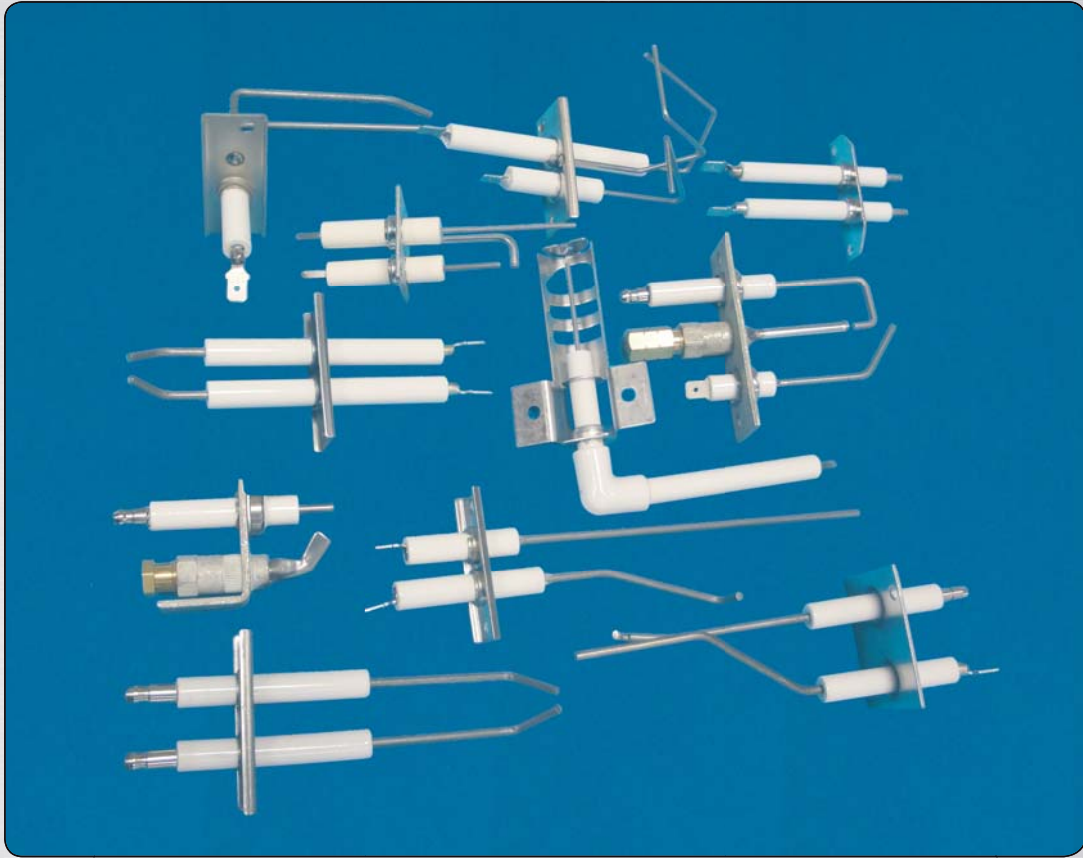
- Frame plates
- Ceramic cores
- Metal basket (core bar) with a template for montage



We execute independently or in cooperation with brick manufacturers all details of tools that improve production of bricks with the goal of reducing cracks and better flow of clay.

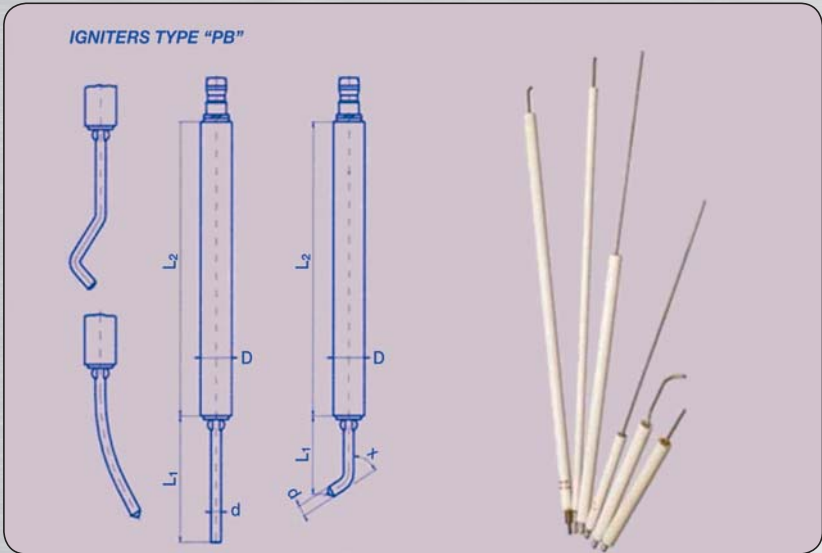
We perform linings of other parts (ex:feed screws) with ceramic plates with a goal of extending their lifetime.





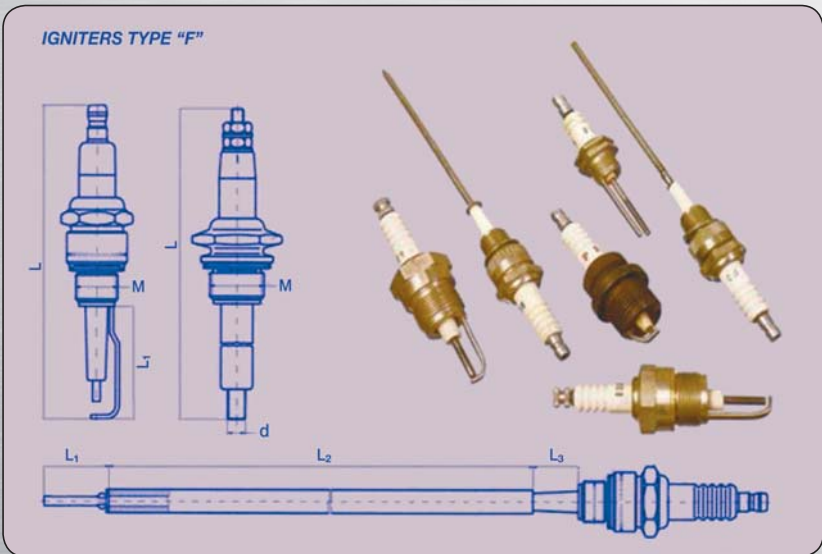
// IGNITERS

// IGNITION ELECTRODES FOR GAS
// INSULATORS FOR IGNITERS



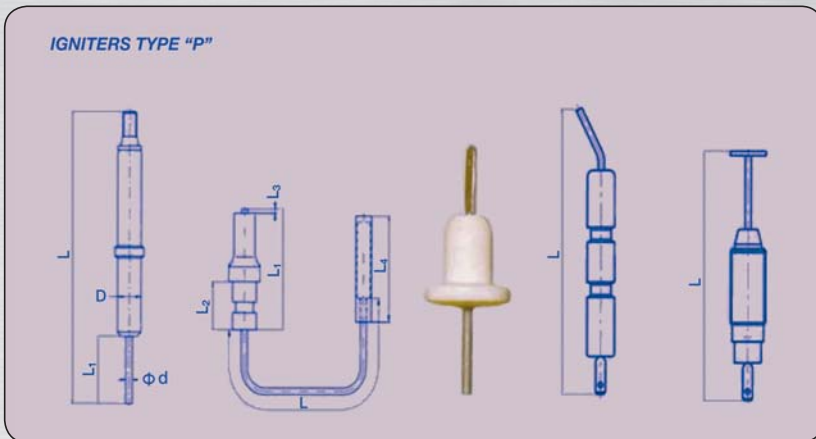
IGNITER TYPE PB

can be made in different dimensions according to customers drawing. Type of electrode depend on application and temperature. Material of electrode can be composited NiCrMnSi or KANTHAL A-D. Diameter of electrode is according to customers request and it is mostly Φ 1,5 mm to Φ 6 mm.



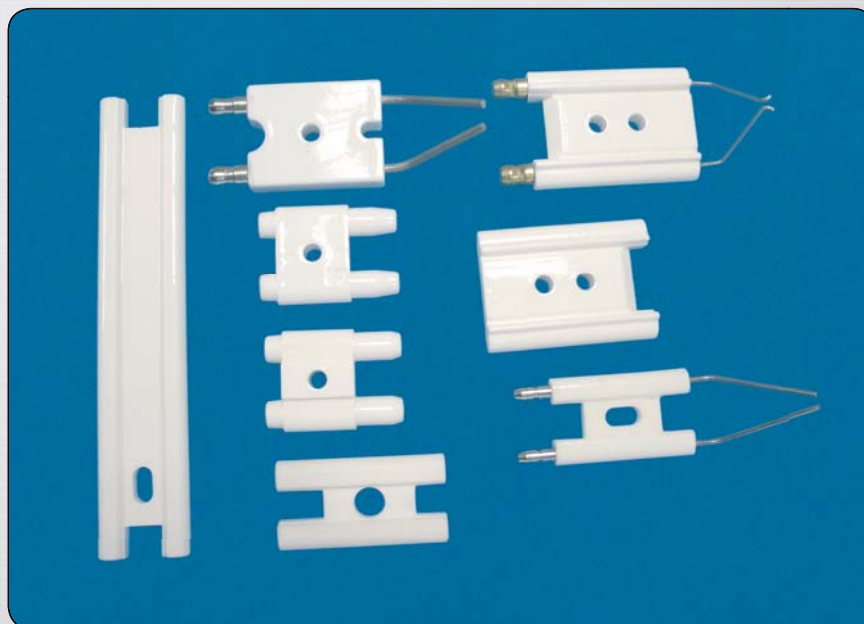
IGNITER TYPE F

are produced in combination with metal body which can be in different sizes. Usually the thread on metal part is: M10, M12, M14 and M18. Material of electrode can be composited NiCrMnSi or KANTHAL A-D. According to customers request the metal body can be also made from stainless steel material.



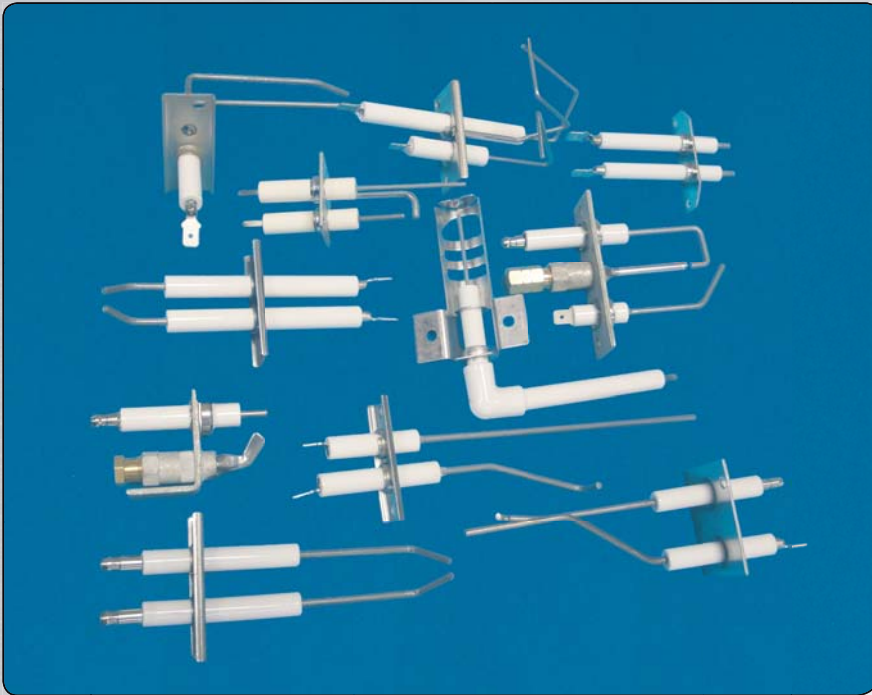
IGNITER TYPE P

are usually made with connection cables and are used for kitchen appliances. Connectors, type and size of the cable can be produced according to customers request. Electrodes are mostly made from material NiCrMnSi and have diameter from Φ 1,8 to Φ 3,2 mm.



IGNITER TYPE H

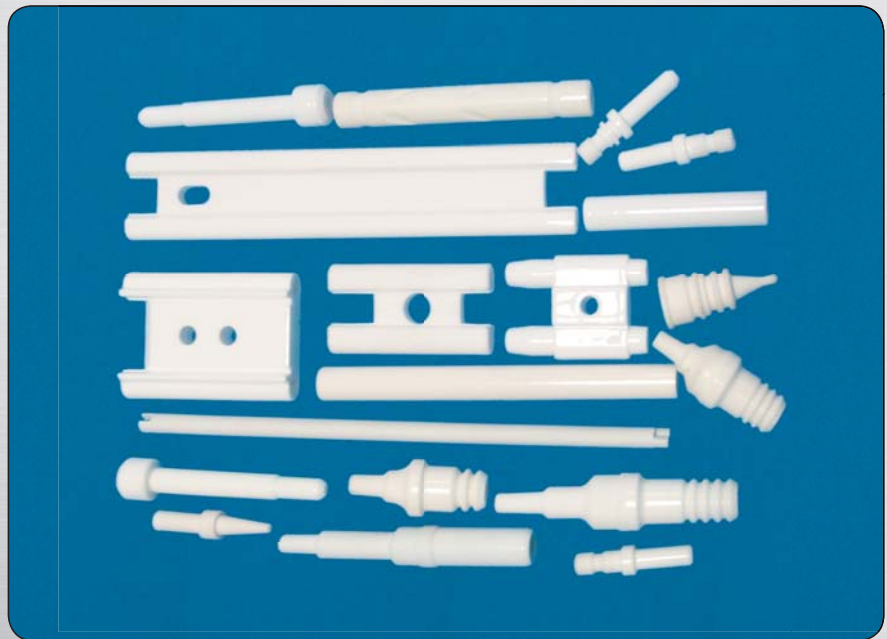
are produced in different sizes and are used in oven for different gas burners. Ceramic is made with or without glazing, according to customers request. The quality of ceramics can be from 95 % to 99,7 % Al_2O_3 . The electrodes are made from nickel alloy NiCrMnSi or from material KANTHAL A-D.

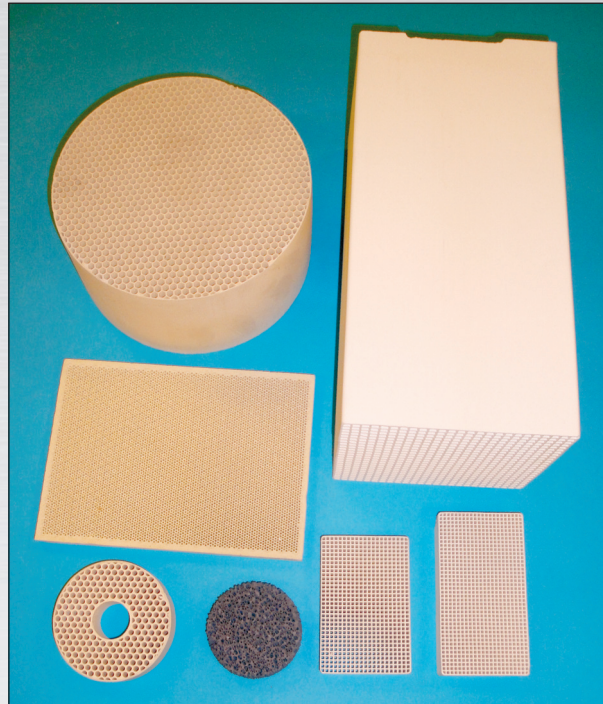


We are producing sets of igniters with different adjusting plates for attaching, different combinations and different shapes of electrodes.

Adjusting plates can be made from standard steel covered with surface protection or from stainless steel. Electrodes are made from nickel alloy NiCrMnSi or from KANTHAL A-D.

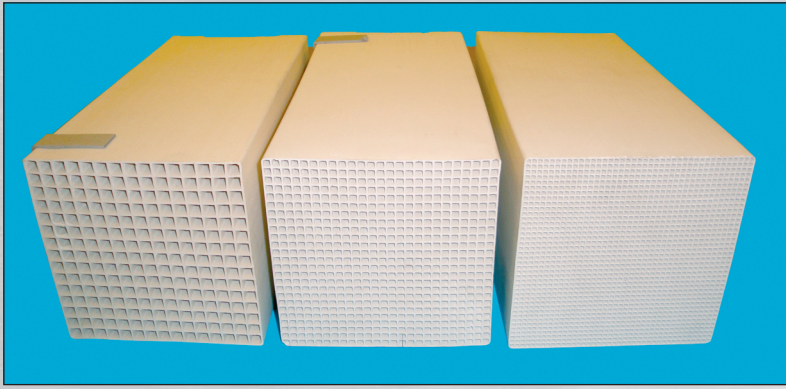
Besides the complete igniters we can also offer just isolators for igniters. Isolators are made from ceramics, which has quality from 95 % to 99,7 % Al_2O_3 and can be glazed or not glazed.



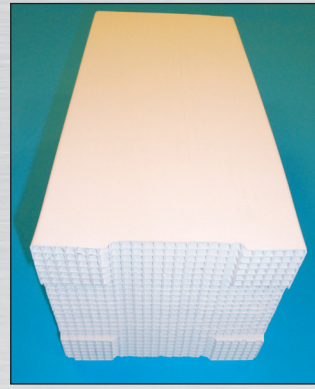


// HEAT EXCHANGING ELEMENTS

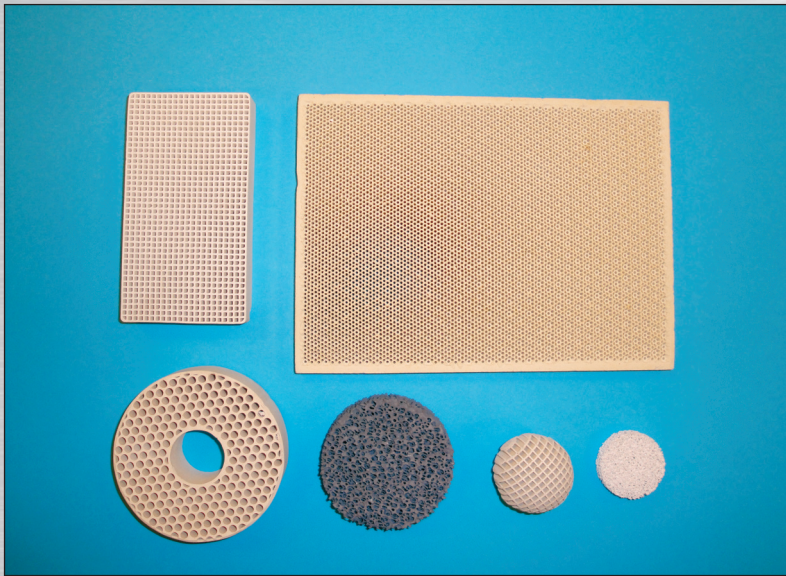
// CERAMIC HONEYCOMB FILTERS
// CATALYST SUPPORTING BALLS



We make heat exchangers with different sizes of honeycombs, according to customer's request.

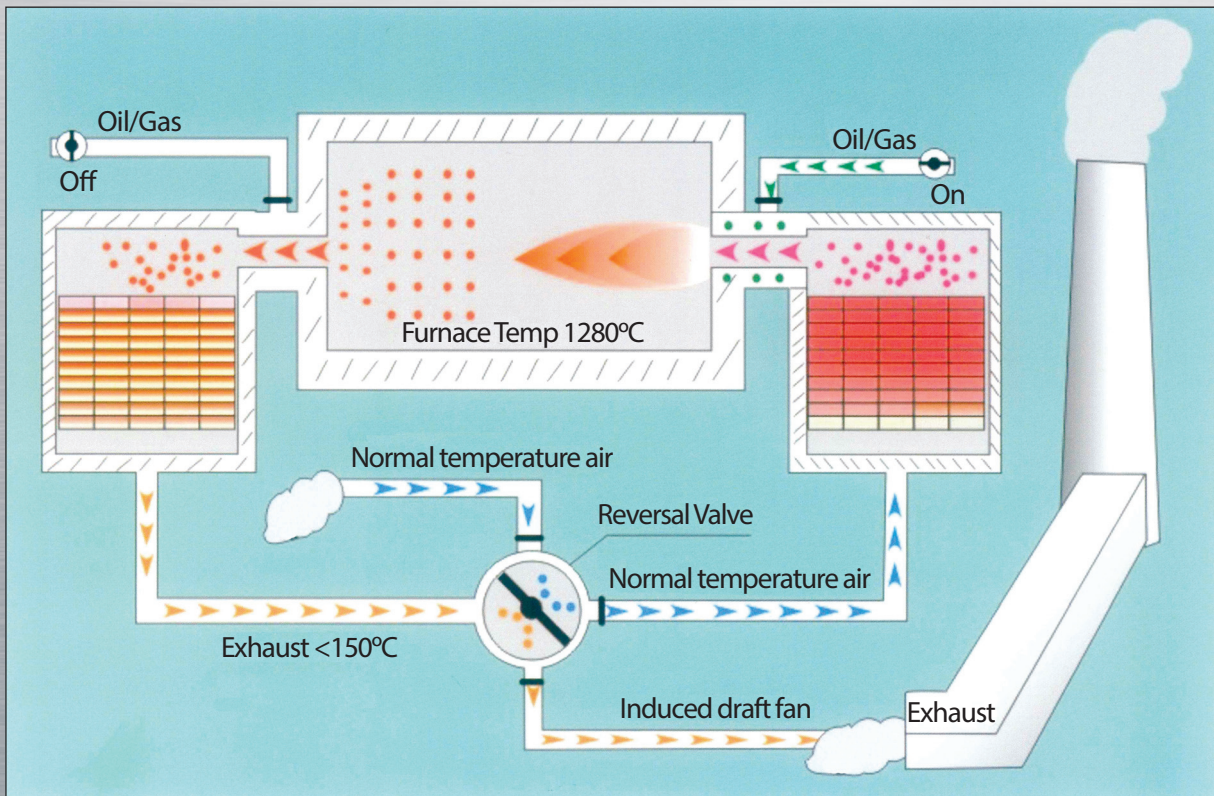


For better airflow on heat exchangers, we can make end steps with high 5mm



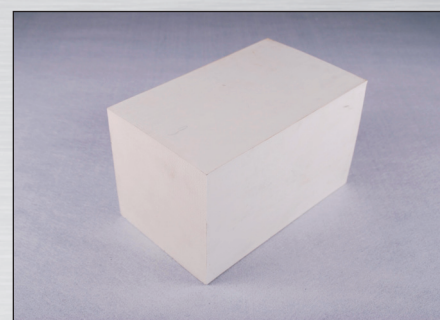
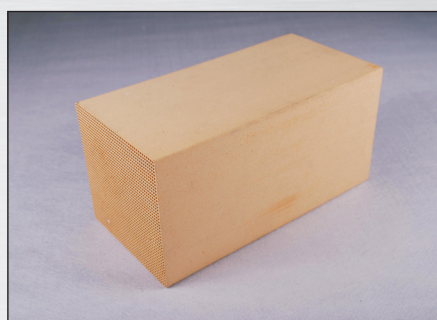
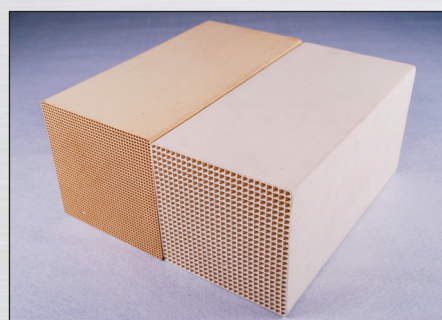
Different shapes of filters are used in different branches of chemical industry. Shapes of filters can be adjusted to customer's request.

Scheme below shows working process of the furnace with installed heat exchangers.



DIMENSIONS OF STANDARD HONEYCOMBS

Dimension	Quantity of channels	Wall thickness	Outside wall thickness	Channel Width	Void section	Weight piece
150x150x300	13x13	1.5mm±0.1	1.7mm±0.15	9.8-10mm	70%	3.8-4.8kg
150x150x300	15x15	1.4mm±0.1	1.6mm±0.15	8.3-8.5mm	69%	3.8-4.8kg
150x150x300	25x25	1.0mm±0.1	1.2mm±0.15	4.8-5.0mm	67%	4.0-5.0kg
150x150x300	40x40	0.7mm±0.1	1.1mm±0.15	2.9-3.1mm	64%	4.7-5.7kg
150x150x300	43x43	0.65mm±0.1	1.1mm±0.15	2.7-2.9mm	62%	4.8-5.8kg
150x150x300	50x50	0.6mm±0.1	0.8mm±0.15	2.3-2.5mm	61%	4.8-5.8kg
150x150x300	60x60	0.45mm±0.1	0.8mm±0.15	1.9-2.1mm	63.4%	4.7-5.7kg



CHEMICAL AND PHYSICAL PROPERTIES:

Characteristics:	Cordierite-Mullite	Cordierite	Mullite	Corundum-Mullite
SiO ₂ %	33-45	45-55	25-35	20-30
Al ₂ O ₃ %	38-50	30-40	52-65	65-75
MgO %	3-10	8-13	-	-
Fe ₂ O ₃ %	<1,5	<1,5	<1,5	<1,5
K ₂ O+Na ₂ O	<1,2	<1,2	<1,2	<1,2
Thermal expansion coefficient (10 ⁻⁶ /K-1)	<4	<4	<5	<8
Specific Heat (J/kg·K)	800-900	800-950	900-1000	950-1100
Working Temperature	<1350	<1300	<1450	<1500

CERAMIC BALLS FOR CHEMICAL INDUSTRY



Ceramic balls with high share of $Al_2O_3 \geq 99\%$ are used as catalysts in chemical industry or are used in heat exchangers.

CHEMICAL PROPERTIES:

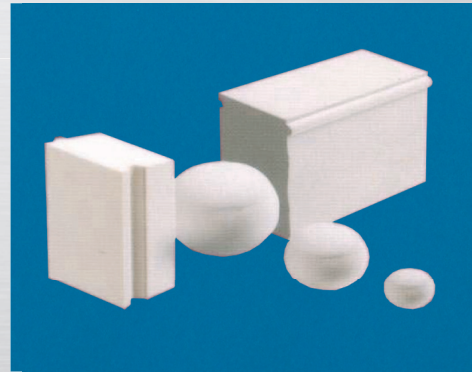
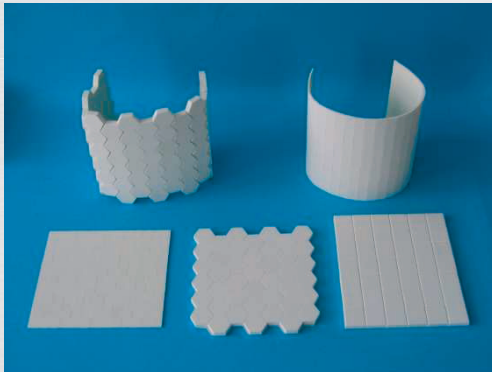
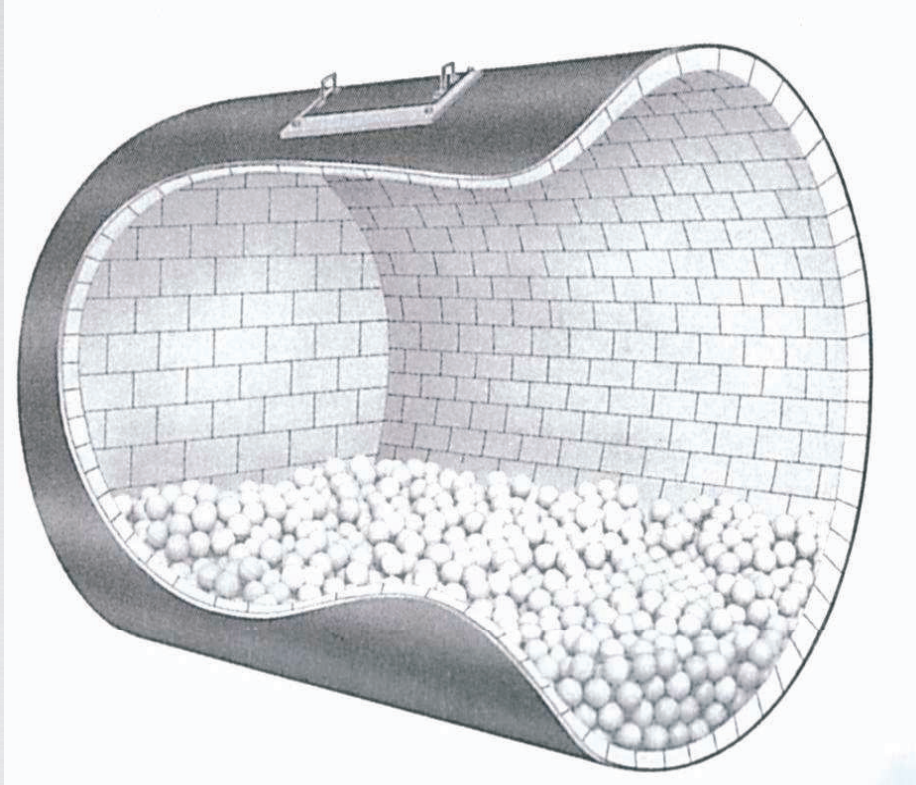
Al_2O_3	SiO_2	CaO	TiO_2	MgO_2	FeO_3	Na_2O
$\geq 99,1\%$	$\leq 0,15\%$	$\leq 0,1\%$	$\leq 0,1\%$	$\leq 0,1\%$	$\leq 0,1\%$	$\leq 0,15\%$

PHYSICAL PROPERTIES

Bulk Density (gr/cm ³)	3,35-3,70
Packing Density (ton/m ³)	2,1-2,2
Hardness (Mohs)	9
E-Modulus (Gpa)	300-330
Specific Heat; 30°C-100°C (J/kg.K)	820-1030
Thermal Conductivity; 30°C-100°C (W/M.K)	19-30
Coefficient of Thermal Expansion 30-600°C (10 ⁻⁶ •K ⁻¹)	7-9
Heat Resistance	Up to 1680°C

DIMENSIONS OF BALLS: we produce different sizes of CATALYST SUPPORTING BEDS from Ø 3 to Ø 60 mm.

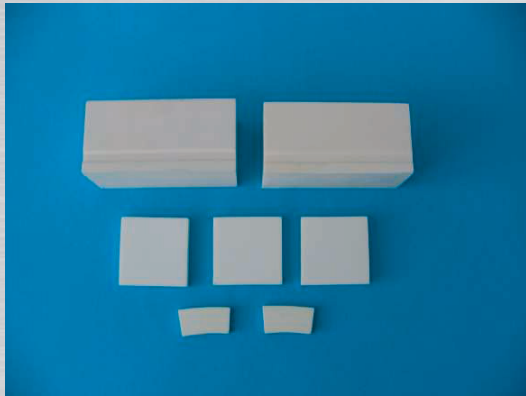
PACKING: packed in bags with 25 kg or big bags with 1 ton.



// LINING AND GRINDING MEDIA

Due to the excellent characteristics of aluminium oxide ceramic Al_2O_3 like high hardness and abrasive resistance, ceramic has found application for inside wall linings as well as for elements for milling – balls and rolls.

<i>GENERAL FEATURES</i>			
	<i>MATERIAL</i>		
<i>Al₂O₃ content</i>	<i>92%</i>	<i>95%</i>	<i>99,7%</i>
<i>Specific weight (g/cm³)</i>	<i>>3,6</i>	<i>> 3,68</i>	<i>>3,90</i>
<i>Hardness (Mohs)</i>	<i>9</i>	<i>9</i>	<i>9</i>
<i>Compression strength (mpa)</i>	<i>≥ 2000</i>	<i>≥ 2200</i>	<i>≥ 2250</i>
<i>Colour</i>	<i>white</i>	<i>white</i>	<i>white</i>



ALUMINA BALLS

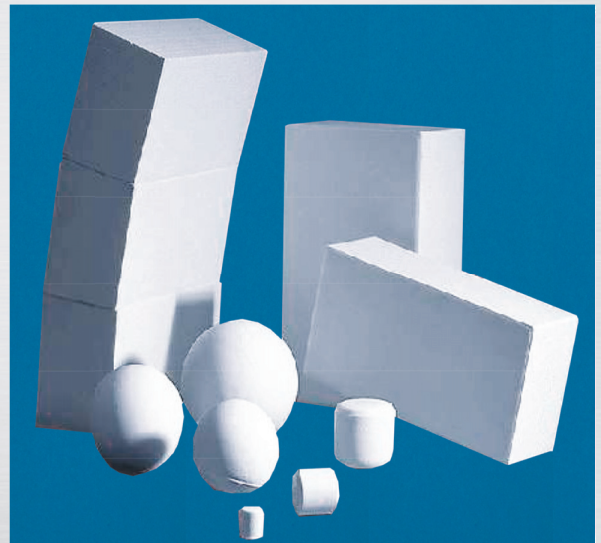
<i>DIAMETERS</i>
<i>3/5 mm</i>
<i>5/7 mm</i>
<i>7/9 mm</i>
<i>9/11 mm</i>
<i>12 mm</i>
<i>14 mm</i>
<i>16 mm</i>
<i>18 mm</i>

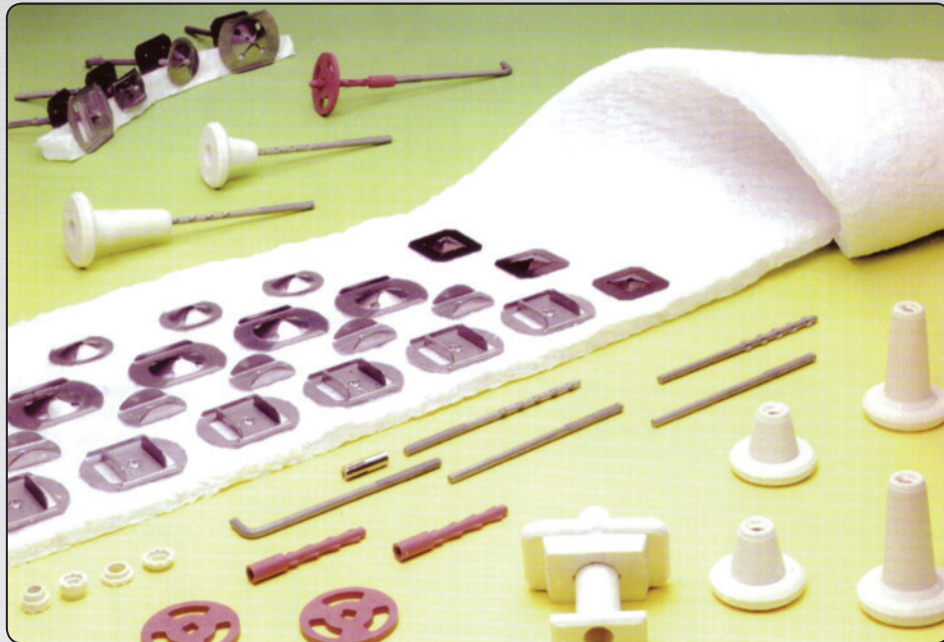
<i>DIAMETERS</i>	
<i>mm</i>	<i>Inches</i>
<i>20</i>	<i>¾</i>
<i>25</i>	<i>1</i>
<i>30</i>	<i>1 ¼</i>
<i>40</i>	<i>1 ½</i>
<i>45</i>	<i>1 ¾</i>
<i>50</i>	<i>2</i>
<i>60</i>	<i>2 ½</i>



ALUMINA LINING BRICKS

<i>Standard sizes in mm</i>					
		<i>Rectangular brick</i>			
<i>Length</i>		<i>150</i>	<i>150</i>	<i>150</i>	<i>150</i>
<i>Width</i>		<i>50</i>	<i>50</i>	<i>50</i>	<i>50</i>
<i>Thickness</i>		<i>40</i>	<i>60</i>	<i>70</i>	<i>100</i>
		<i>Trapezoid brick</i>			
<i>Length</i>		<i>150</i>	<i>150</i>	<i>150</i>	<i>150</i>
<i>Width</i>	<i>A1</i>	<i>50</i>	<i>50</i>	<i>50</i>	<i>50</i>
	<i>A2</i>	<i>45</i>	<i>45</i>	<i>45</i>	<i>45</i>
<i>Thickness</i>		<i>40</i>	<i>60</i>	<i>70</i>	<i>100</i>





// CERAMIC AND REFRACTORY ANCHOR

// CERAMIC AND REFRACTORY ANCHORAGE SYSTEMS FOR THE FURNACE INDUSTRY
// HIGH TEMPERATURE MATERIALS

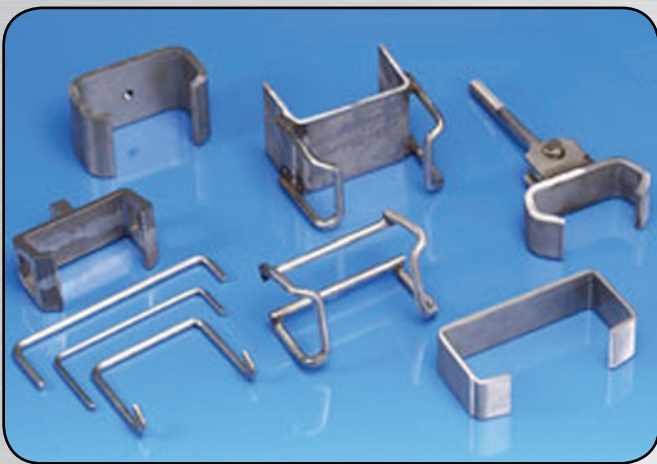
REFRACTORY ELEMENTS FOR INDUSTRIAL FURNACES



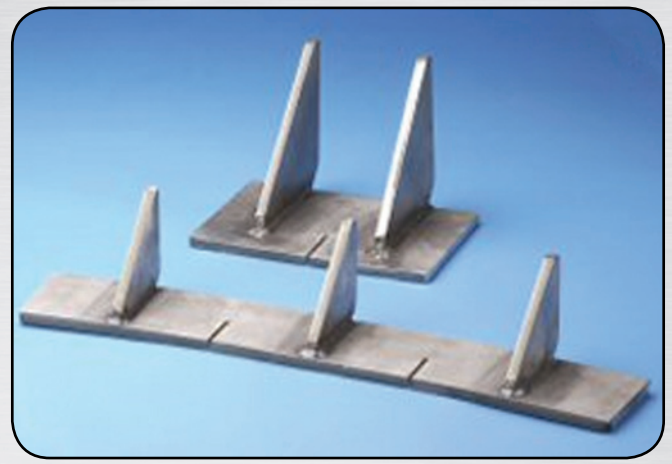
Anchors for castables



Anchors for fibres

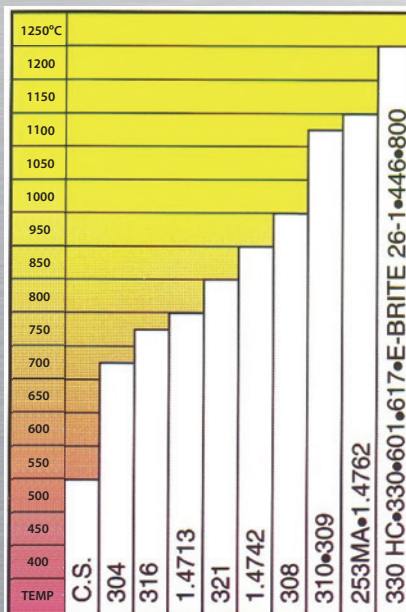


Bricks anchors



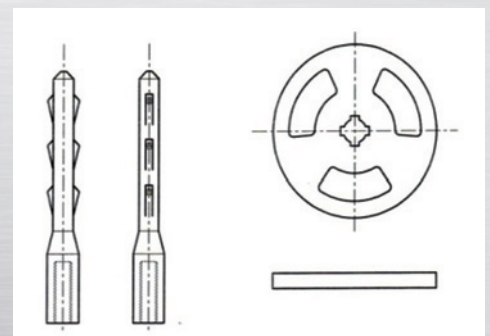
Support brackets

All elements are made of very quality fire resistant materials.



DIFERENT ALLOY APPLICATION TEMPERATURES

In this table you can see materials, which are used for metal components



CERAMIC CUPLOCKS

They are made from high quality aluminium oxide over 95% Al_2O_3

This material is resist ant on high temperatures, up to 1550° C



Textiles and biosoluble or ceramic fibers:

Biosoluble and ceramic fibers are reinforced with glass or steel fibers.

Classification temperature:

- ceramic fibers: 1260° C
- biosoluble fibers: 1200° C
- glass reinforcement: 500° C
- refractory steel reinforcement: 1000° C

● MASTICS

Packaging:

- 300 gr plastic cartridges usable with mechanical guns.
- 600 or 1500 gr bars usable with pneumatic guns.
- 5 to 25 Kg pots usable manually or with a high capacity pump.



Eco Mastic made of biosoluble fibres.



Mastic made of ceramic fibres.

Three qualities:

- Mastic 126 (1260 °C)
- Mastic 140 (1425 °C)
- Mastic 160 (1600 °C)

● FIBERCOLLE 11

A mix of several inorganic products to glue insulating products together or on a steel plate.



Packaging:

- 10 liters pot: 15 Kg
- 1 litre pot: 1.5 Kg
- Yield on non porous smooth surfaces: 2 Kg/m² or 1.33 l/m².

classification temperature: 1100 °C

DIFFERENT ELEMENTS FOR INDUSTRIAL FURNACES



Metalic fiberes for refractory castables



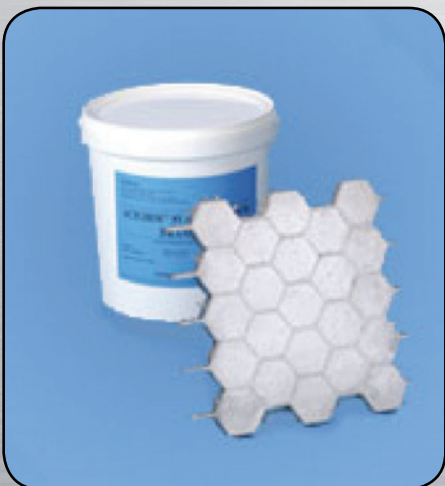
Braided & twisted ropes, textiles
in high temperatures fiberes



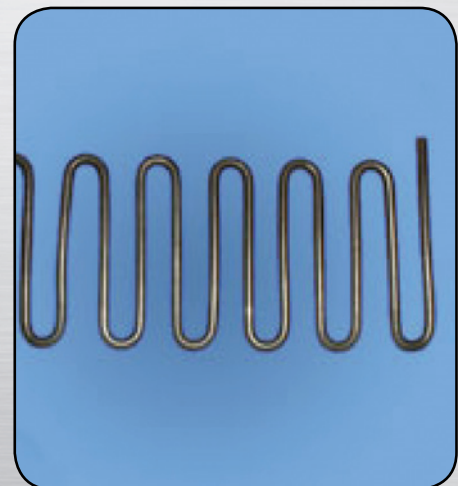
Metalic fiberes for refractory castables



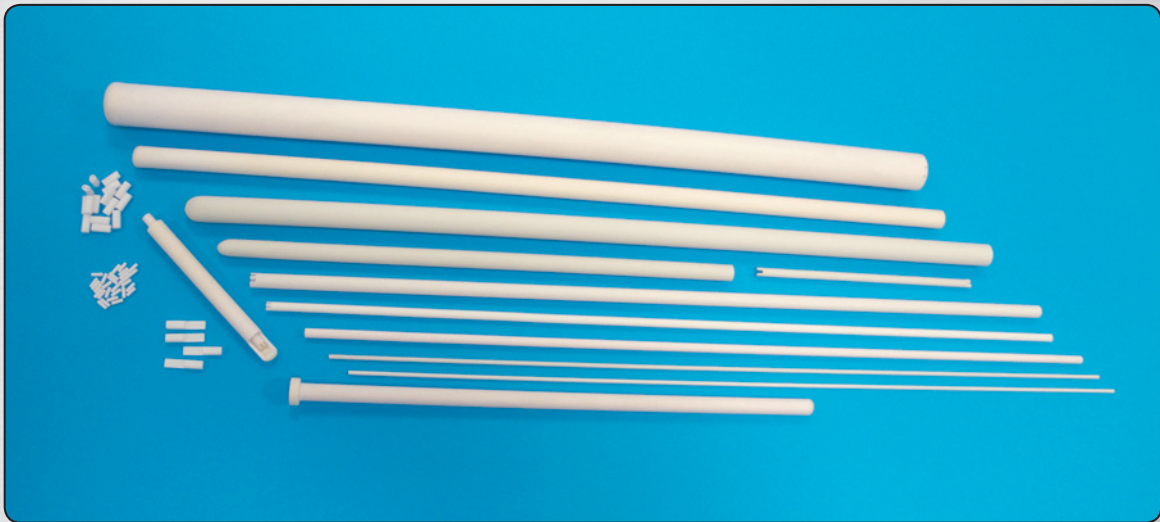
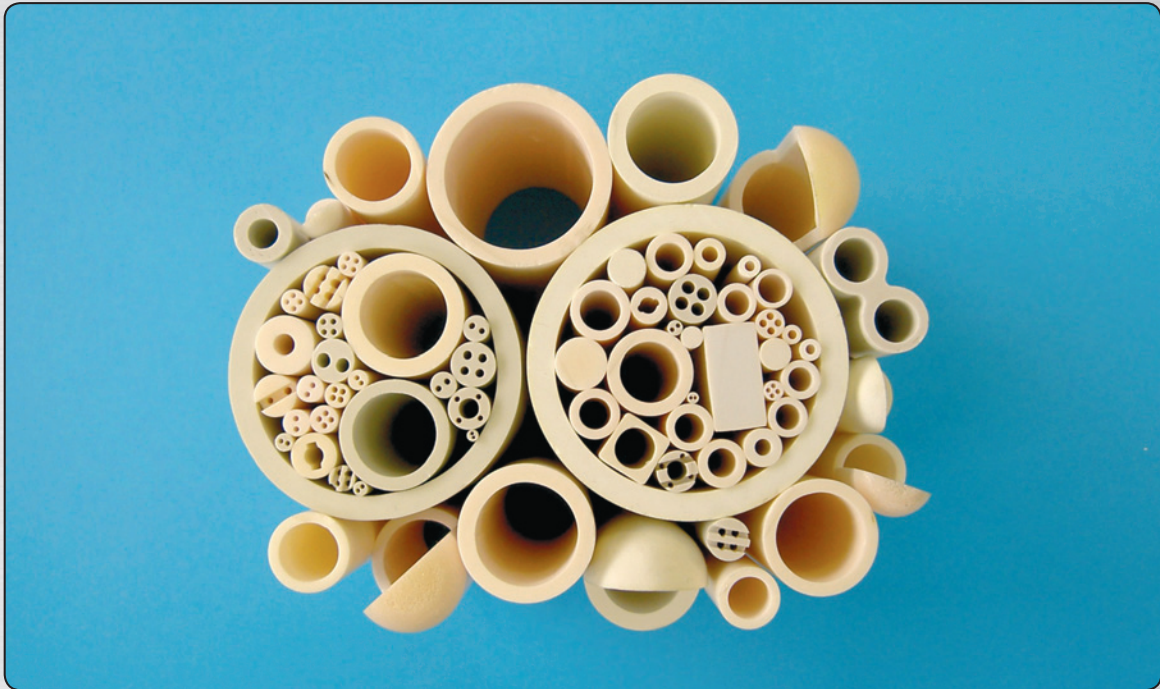
Braided & twisted ropes, textiles
in high temperatures fiberes



Actchem

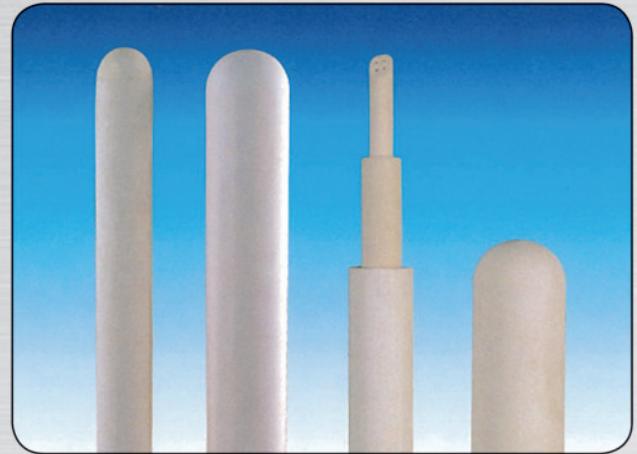


Molybdenum element



// CERAMIC TUBES AND INSULATORS

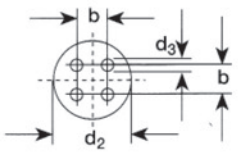
// CERAMIC TUBES AND INSULATORS FOR THERMOELEMENTS

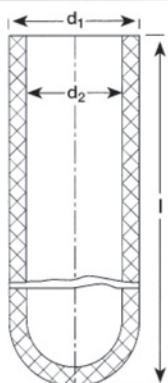


PROPERTY	UNIT	ALUMINA CERAMIC			
Typical application		Tubes for thermoelements resistant to thermal stresses	-insulating tubes for thermoelements -Protection tubes -Insulating rods	-Protection tubes -Insulation rods	-Tubes for thermoelements -Protection tubes -Insulating rods -Tubes for chemical process applications
Type to DIN EN 60672-3		C 530	C 610	C 795	C 799
Al ₂ O ₃ - content	%	78	62	95	99,7
Specific gravity	g/cm ³	2,5	2,7	3,68	3,82
Water absorption	%	8 - 12	0	0	0
Hardness	Mohs	6	8	9	9
Modulus of elasticity	GPa		100	280	300
Flexural strenght	N/mm ²	30	120	280	300
Coefficient of linear expansion					
20-100 °C	x10 ⁻⁶ /°C	3,5 - 5	5 - 6	5 - 7	5 - 7
20-300 °C		3,5 - 5	5 - 6	6 - 7,5	6 - 8
20-600 °C		4 - 6	5 - 7	6 - 8	7 - 8
20-1000 °C		4 - 7	5 - 7	7 - 9	7 - 9
Specific heat (20 - 100) °C	J/KgK	800 - 900	850 - 1050	850 - 1050	850 - 1050
Thermal conductivity	W/mK	1,4 - 2	4 - 6	16 - 28	19 - 30
Maximum thermal stress	K	350	150	140	150
Dialectric strenght	KV/mm		17	15	17
Max. Temp. use	°C	1500	1500	1550	1650
Chemical resistivity		satisfactory	good	good	very good
Thermal shock resistance		very good	medium to good	medium	medium

The maximum application temperature depends on the material. The application temperature is also influenced by the tube geometry, the diameter, the wall thickness and the method of application.

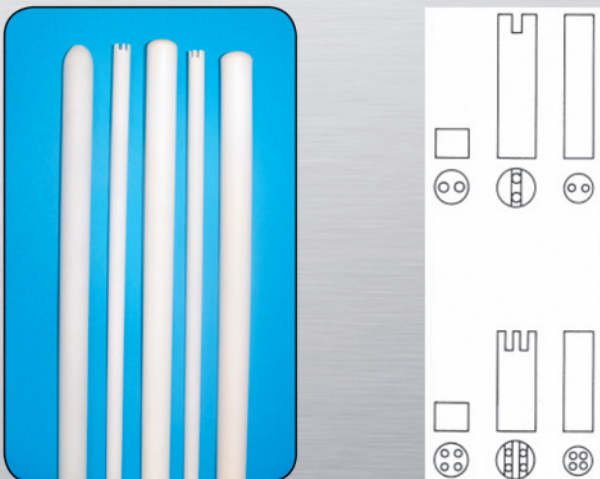
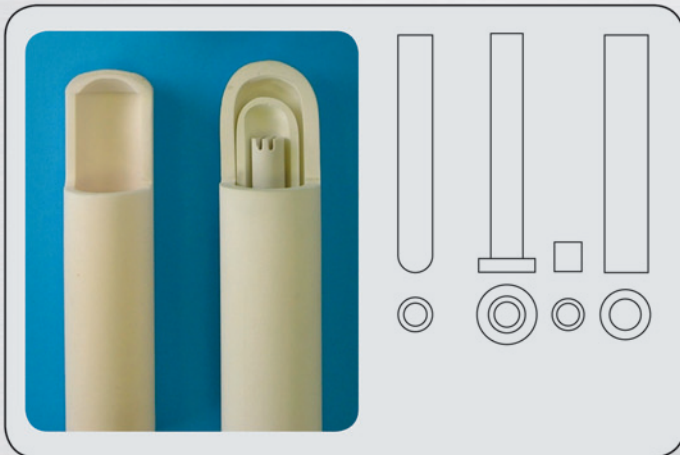
Measurements for ceramic tubes and insulators for thermoelements according to DIN 43724 and DIN 43725

 Materials for insulation rods C 610 or C 799 DIN EN 60672	4-bore insulation rods according to DIN 43725			Wire Ø	1-bore insulation rods according to DIN 43725			Wire Ø
	Outer Ø (d ₂) in mm	Bore Ø (d ₃) in mm	Length in mm	Ø in mm	Outer Ø (d ₁) in mm	Inner Ø in mm	Length in mm	Ø in mm
5.5	1.2	205	≤ 0.8	2.7 ± 0.2	1.7	10, 25, 50	1.0 and 1.38	
		275						
8.5	1.5	380	≤ 0.8	4.0 ± 0.3	2.0	10, 25, 50	1.38	
		560						
		770						
1060	1.5	1060	≤ 0.8	6.0 ± 0.3	4.0	10, 25, 50	3.0	
		1460						
		2060						

	Ceramic tubes DIN 43724					
	DIN EN 60672	Outer Ø (d ₁) in mm	Inner Ø (d ₂) in mm	Length (L) in mm	Thermal shock resistance	Permeability
C 610	10	7	200, 270, 375, 530, 740, 1030, 1430, 2030	medium to good	gastight	1500 C
	15	11	530, 740, 1030, 1430, 2030			
	24	19	530, 740, 1030, 1430, 2030			
C 530	26	18	530, 740, 1030, 1430, 2030	very good	porous	1500 C
	C 799	8	5	200, 270, 375, 530, 740, 1030, 1430, 2030	medium	gastight
10		6	200, 270, 375, 530, 740, 1030, 1430, 2030			
15		10	530, 740, 1030, 1430, 2030			
24		18	530, 740, 1030, 1430, 2030			

In this table there are mentioned some standard dimensions for tubes and insulators.

We can produce all other lengths, up to max 2100 mm, and other diameter from 2 mm to max 50 mm.



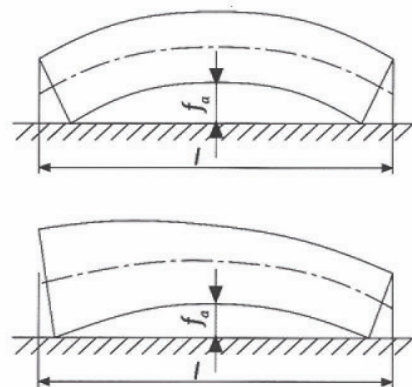
Diameter tolerances - deflectional tolerances

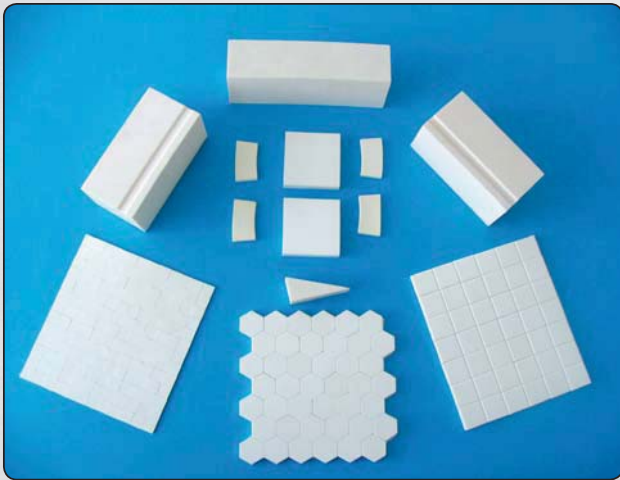
without grinding to DIN 40 680, issue 1983

Nominal dimensional range for diameter or length in mm	Degree of accuracy		Nominal dimensional range for length in mm	Degree of accuracy	
	coarse Permissible deviation in mm	medium Permissible deviation in mm		coarse Permissible deflection f_a in mm	medium Permissible deflection f_a in mm
up to 4	± 0.4	± 0.15	up to 30	± 1.7	± 0.15
above 4 up to 6	± 0.6	± 0.20	above 30 up to 40	± 1.8	± 0.20
above 6 up to 8	± 0.7	± 0.25	above 40 up to 50	± 1.9	± 0.25
above 8 up to 10	± 0.8	± 0.30	above 50 up to 60	± 2.0	± 0.30
above 10 up to 13	± 1.0	± 0.35	above 60 up to 70	± 2.1	± 0.35
above 13 up to 16	± 1.2	± 0.40	above 70 up to 80	± 2.1	± 0.40
above 16 up to 20	± 1.2	± 0.45	above 80 up to 90	± 2.2	± 0.45
above 20 up to 25	± 1.5	± 0.50	above 90 up to 100	± 2.3	± 0.50
above 25 up to 30	± 1.5	± 0.55	above 100 up to 110	± 2.4	± 0.55
above 30 up to 35	± 2.0	± 0.60	above 110 up to 125	± 2.5	± 0.65
above 35 up to 40	± 2.0	± 0.65	above 125 up to 140	± 2.6	± 0.70
above 40 up to 45	± 2.0	± 0.70	above 140 up to 155	± 2.7	± 0.80
above 45 up to 50	± 2.5	± 0.80	above 155 up to 170	± 2.9	± 0.85
above 50 up to 55	± 2.5	± 0.90	above 170 up to 185	± 3.0	± 0.90
above 55 up to 60	± 2.5	± 1.00	above 185 up to 200	± 3.1	± 1.00
above 60 up to 70	± 3.0	± 1.20	above 200 up to 250	± 3.5	± 1.25
above 70 up to 80	± 3.5	± 1.40	above 250 up to 300	± 3.9	± 1.50
above 80 up to 90	± 4.0	± 1.60	above 300 up to 350	± 4.3	± 1.75
above 90 up to 100	± 4.5	± 1.80	above 350 up to 400	± 4.7	± 2.00
above 100 up to 110	± 5.0	± 2.00	above 400 up to 450	± 5.1	± 2.25
above 110 up to 125	± 5.5	± 2.20	above 450 up to 500	± 5.5	± 2.50
above 125 up to 140	± 6.0	± 2.50	above 500 up to 600	± 6.3	± 3.00
above 140 up to 155	± 6.5	± 2.80	above 600 up to 700	± 7.1	± 3.50
above 155 up to 170	± 7.0	± 3.00	above 700 up to 800	± 7.9	± 4.00
above 170 up to 185	± 7.5	± 3.40	above 800 up to 900	± 8.7	± 4.50
above 185 up to 200	± 8.0	± 3.80	above 900 up to 1000	± 9.5	± 5.00
above 200 up to 250	± 9.0	± 4.20	above 1000	± 1.5+0.8% × L	± 0.5% × L
above 250 up to 300	± 10.0	± 4.60			
above 300 up to 350	± 11.0	± 5.00			
above 350 up to 400	± 12.0	± 5.50			
above 400 up to 450	± 13.0	± 6.10			
above 450 up to 500	± 14.0	± 6.80			
above 500 up to 600	± 15.0	± 7.60			
above 600 up to 700	± 16.0	± 8.30			
above 700 up to 800	± 17.5	± 9.00			
above 800 up to 900	± 19.0	± 9.50			
above 900 up to 1000	± 20.0	± 10.00			
above 1000	± 0.02 × D	± 0.01 × D			

Manufacturing method	Degree of accuracy	
	coarse	medium
Cast and extruded for parts \varnothing 30 mm and above	application customary	
extruded for parts up to \varnothing 30 mm		application customary

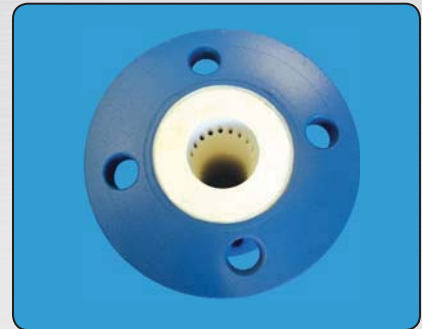
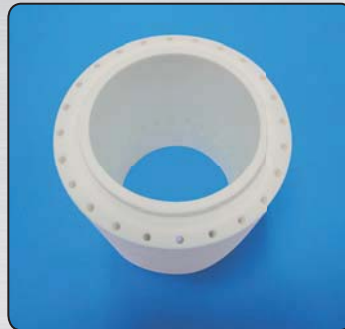
Accuracy	coarse			medium		
	530	610	799	530	610	799
DIN VDE 0335, Type						
Manufacturing method						
cast, extruded \varnothing 30 mm and above	•	•	•			
extruded up to \varnothing 30 mm				•	•	•





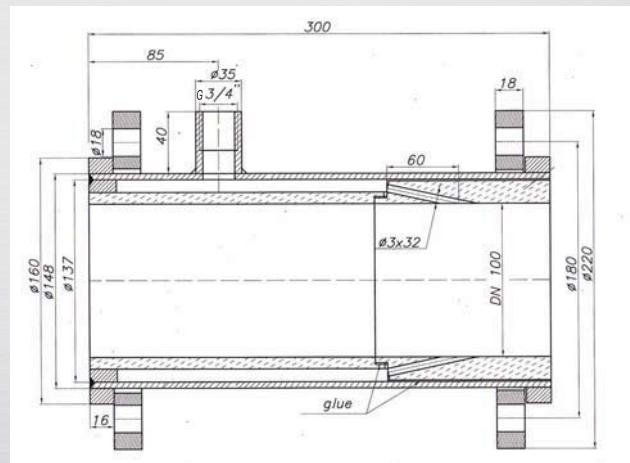
// WEAR PROTECTION PRODUCTS

// TUBES AND ELBOWS WITH CERAMIC PROTECTION FOR PNEUMATIC TRANSPORT
// CERAMIC LINING FOR LARGE SURFACE



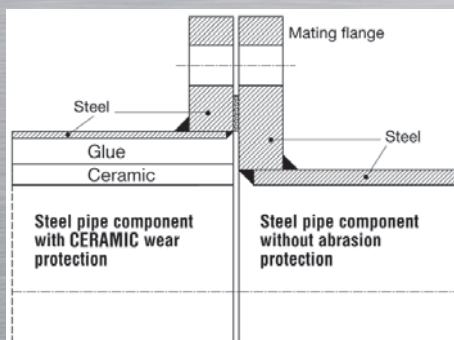
CONVEYOR NOZZLE

Conveyor nozzles are used to accelerate transport with injecting the air in very long transport pipelines. These nozzles are made from ceramic segments which have more than 30 inlets around the scope of nozzle. These inlets are directed in the centre of the tube and that provides consistent air pressure of transport media. At the moment, this is the best solution in technology of pneumatic transport.

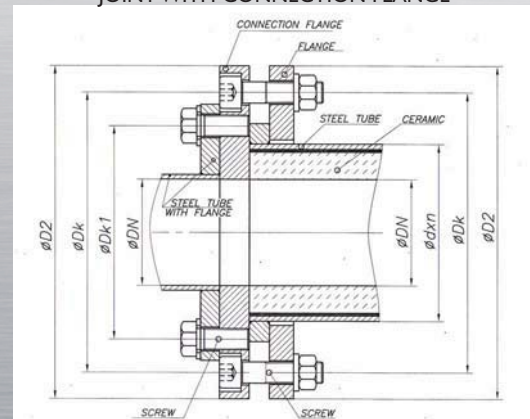


CONNECTION OF METAL TUBE AND METAL-CERAMIC TUBE

STANDARD JOINT



JOINT WITH CONNECTION FLANGE

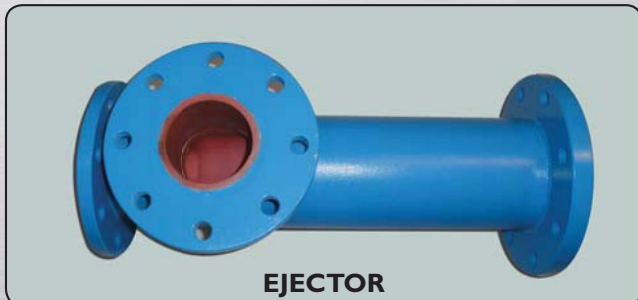




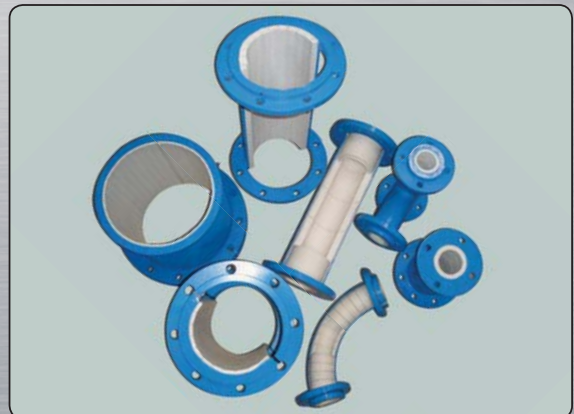
Tubes and elbows with inner diameter of ceramic up to DN 200 mm are made from ceramic cylindrical segments, which have male and female parts (see photo up left). At assembly this assures high quality of joint and long life time.



Tubes and elbows which have inner diameter bigger than DN 200 mm are lined with panels (mosaics) or with cone ceramic plates with requested thickness. Cone plates are adjusted to diameter of the tube or elbow, which are lined with ceramic.



Photos show different positions, which are lined with ceramic, due to big exposure to abrasion.



MATERIALS

Materials that are used for protection of elbows and tubes are:

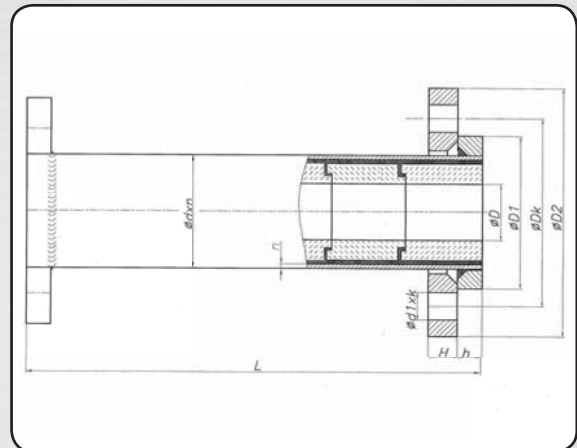
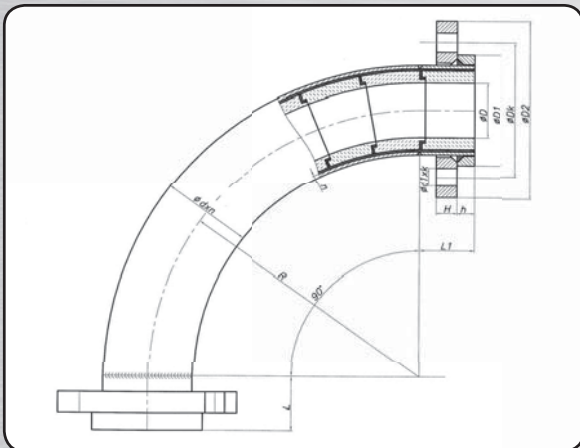
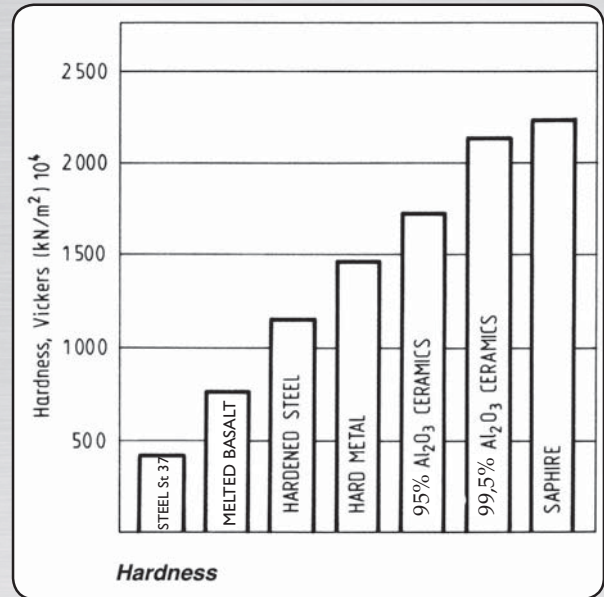
- Aluminium Oxide 95% Al_2O_3
- Aluminium Oxide 99,5% Al_2O_3
- Composite $\text{Al}_2\text{O}_3 + 10\% \text{ZrO}_2$
(Aluminium Oxide + Zirconium Oxide)
- Zirconium Oxide ZrO_{2z}

MECHANICAL PROPERTIES

The widest application of ceramics comes from its excellent mechanical properties.

High hardness and wear resistance, modulus of elasticity, comprehensive and flexural strengths have enabled the application of ceramic parts there where high mechanical stresses are experienced.

Such high strength of Al_2O_3 ceramics is maintained at high temperatures and high abrasiveness, what makes it an excellent replacement for majority of metals, glasses, plastics, etc.



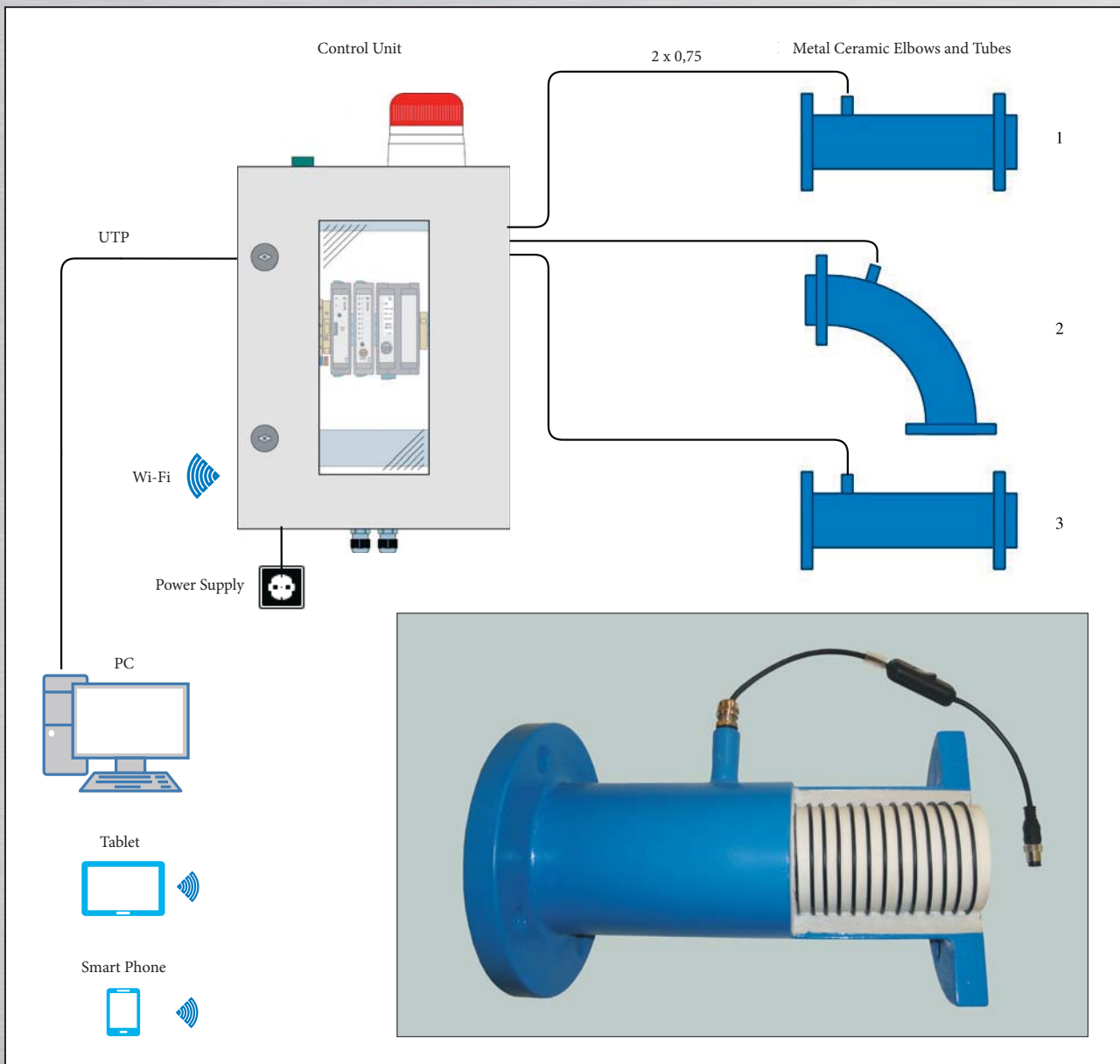
APPLICATION:

Elbows and tubes with ceramic lining have wide application in different industries like pneumatic and hydraulic transport.

The most common applications are:

Industry:	Material:
1. Abrasive products	Grinding wheel granules
2. Aluminium plants	Calcined alumina, bauxite, electrode, carbon, crushed bath
3. Iron & Steel	Sinter dust, limestone, lime injection, coal, iron carbide, alloy additives
4. Mineral wool & insulation products	Perlite, stone dust, refractory fibers, production wastes, dust from sawing operations
5. Foundries	Molding sand, dust collection
6. Glass plants	Batch, cullet, quartz, kaoline, feldspar
7. Breweries, grain processing, feed mills,	Corn, barley, soy beans, malt, cocoa beans, sunflower seeds, rice hulls, malting plants
8. Cement	Clinker dust, limestone, cement, fly ash, coal, blast furnace slag
9. Chemical plants	Caustic lime, fertilizers, lime dust, chrome ore, paint pigments, plastic pallets with glass fibers
10. Mineral mining plants	Kiln feed, ore concentrate, coal tailings, dust
11. Coal fired power stations	Coal, fly ash, pyrites, slag, ash, limestone
12. Coal mines	Coal dust, mine waste for backfilling
13. Technical carbon products	Technical carbon, dust, graphite for electrodes

AVTO G ELECTRONIC CONTROL SYSTEM OF CERAMIC WEAR IN PNEUMATIC TRANSPORT SYSTEMS



Current problems of uncontrolled wear of ceramic lining in pneumatic transport systems are over. We have developed special Avto G electronic control system, which provides complete control of metal ceramic wear in pneumatic transport.

Avto G electronic wear control system provides you with following usefull information:

- it informs you on time, if tubes or elbows are worn out and if they must be replaced,
- it informs you exactly which element in the pipeline is damaged and on which place it must be replaced,
- it informs you when was this element installed and for how long time it has been working,
- and it can provide you with many other custum made information.

The system automatically gives you a light/alarm signal, when the elbow or tube is damaged. This information can be also seen on your computer, tablet or smart phone. After the signal, you know that ceramic lining is already worn out and that you still have only metal tube left, as a protection. It means that after the signal, you still have time to order new tube or elbow. Therefore our electronic control system prevents unpredictable breakthroughs and unnecessary stopping of production.

We hope our system will help you to improve your production efficiency and make your future easier.

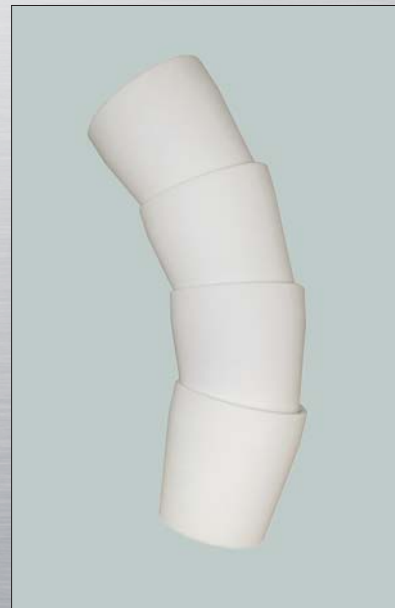
FLEXIBLE TUBES FOR TRANSPORT OF VERY ABRASIVE MATERIALS



In pneumatic transport systems, where exact dimensions of tubes and bends can not be defined, ceramic lined flexible rubber tubes can be used. Ceramic lining is produced according to principle male-female part in shape of joint, what makes the rubber tubes more flexible and allows bending in every direction.

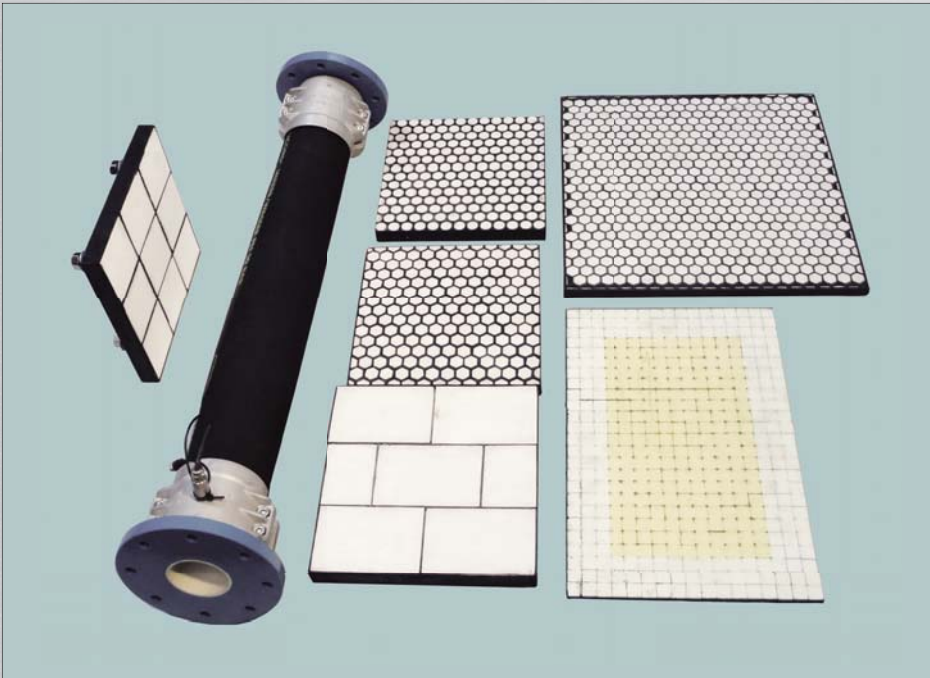


Our ceramic lined flexible tubes can also be produced with electronic control system, so you can successfully monitor wear of ceramic on computer, iPad or mobile phone.

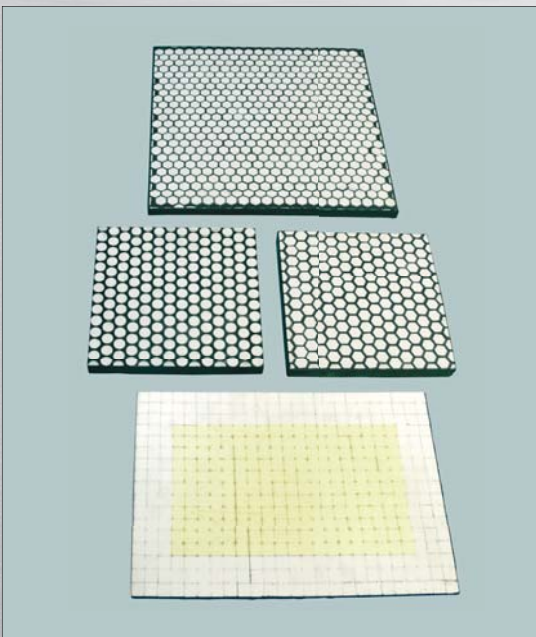


The advantage of our ceramic lined flexible tubes is, that the complete inner surface of rubber tube is covered with ceramics. The rubber tube is reinforced with wire net and can withstand the pressure until 10 bar.

POSSIBLE COMBINATIONS OF CERAMIC-RUBBER COMPOSITION AND OF METAL-RUBBER-CERAMIC COMPOSITION

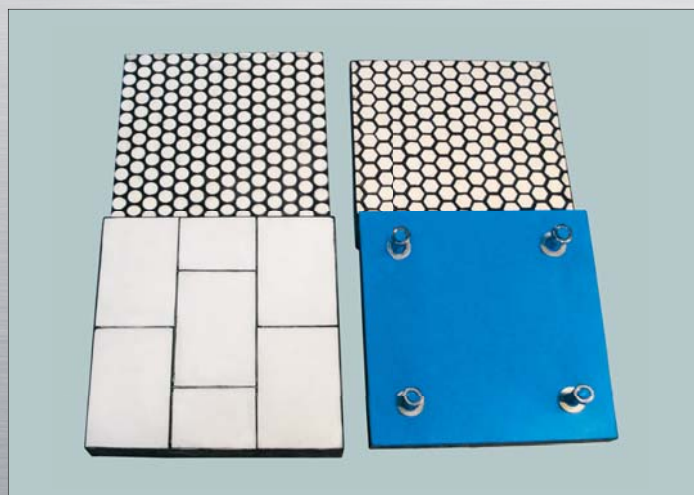


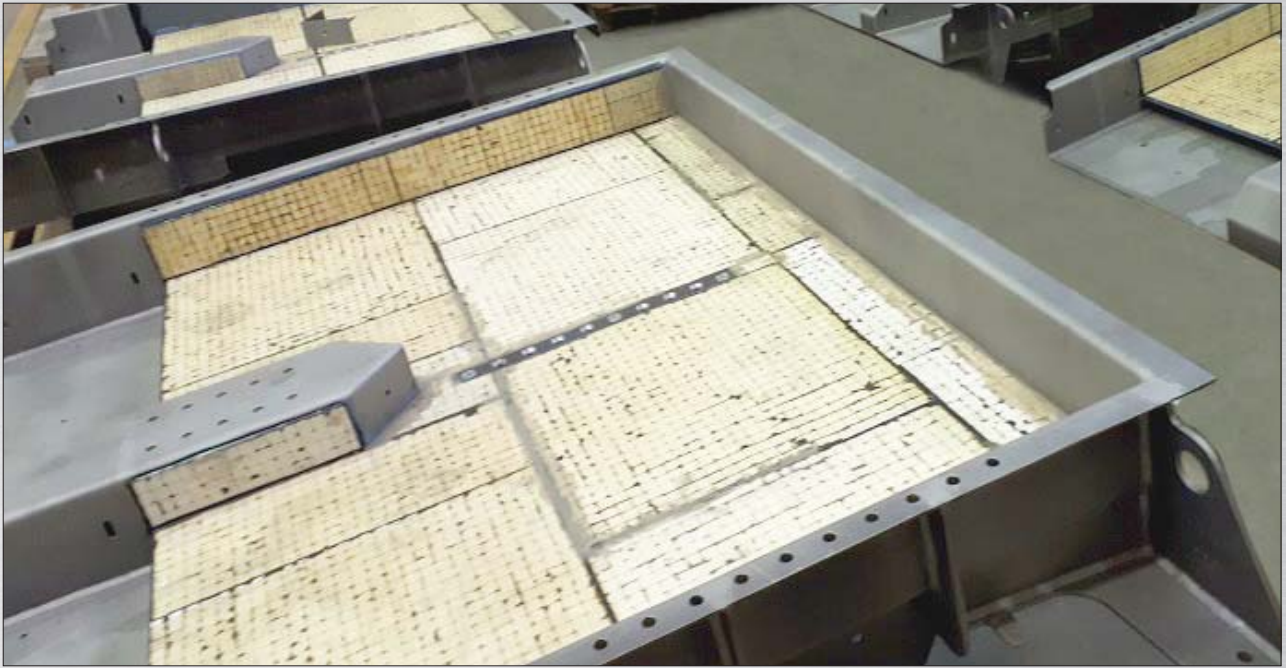
In aggressive and heavy industrial environments where high temperatures, strong vibrations, impacts and abrasion are present during the material transport, the best product to be used is combination of rubber and ceramic.



We have the possibilities to vulcanize all types of ceramic mosaics with rubber thicknesses from 2 mm to 10 mm and hardnesses in range from 40 to 65 Shore [ShA], depending on the application requirements of the end products.

Where it is not possible to glue the rubber to the base liner, we can make a metal housing into which the ceramic will be vulcanised. Metal housing can be with different sizes or shapes. We can also produce custom made designs. On the metal housing we can weld bolts and threads or we can weld rods for fixing to the base liner, which must be protected against abrasion.





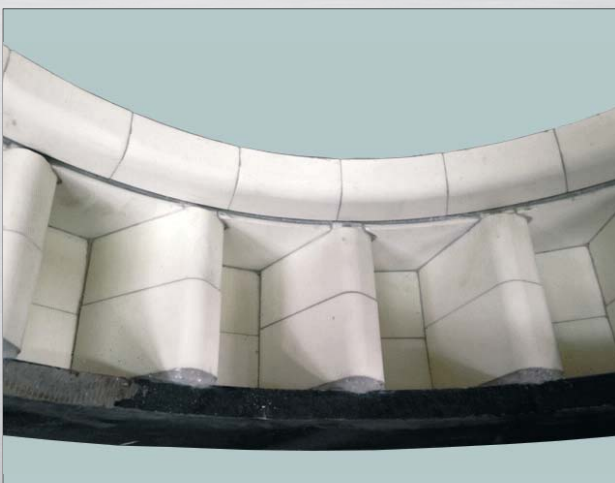
It is very easy and fast to assembly the vulcanized ceramic items onto the required surface.



Ceramic custom made wear protection products on augers against high abrasion.



Wear protection of big diameter pipelines.



Ceramic custom made wear protection for stators, rotor parts and other components in sand mixers and sand pumps, which are used for sand distribution in pneumatic pipelines.





Ceramic cylinders and cones are produced by isostatic pressing and they provide long lifetime of different pipelines, dosage machines for powder materials, different nozzles and other products.

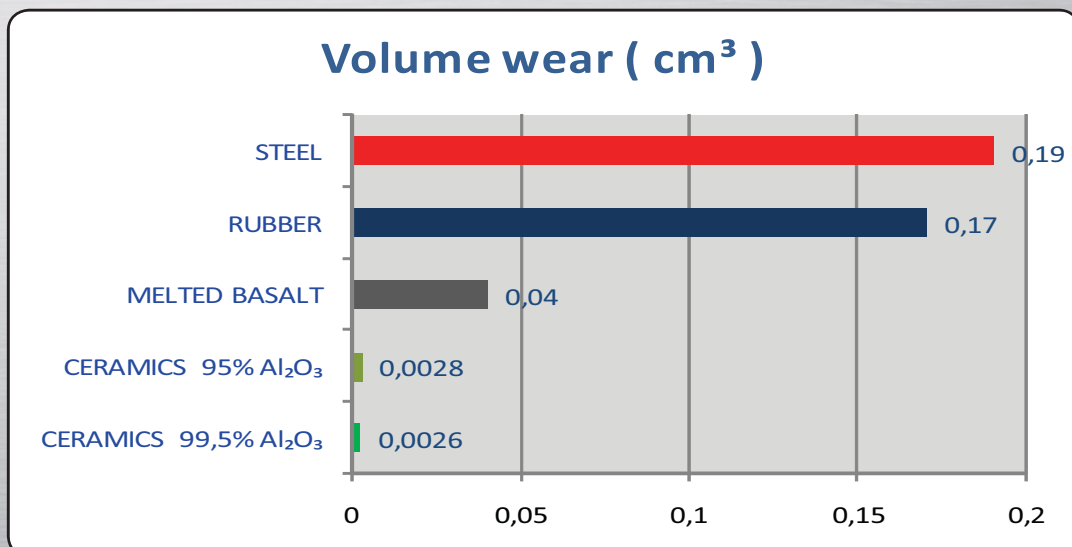


WEAR TESTS ON DIFFERENT MATERIALS:

Sample	CERAMICS 99,5% Al ₂ O ₃	CERAMICS 95% Al ₂ O ₃	MELTED BASALT	RUBBER	STEEL
Density (gr/cm ³)	3,85	3,7	2,95	1,18	7,85
Mass wear (gr)	0,007	0,009	0,12	0,2	1,51
Volume wear (cm ³)	0,0026	0,0028	0,04	0,17	0,19

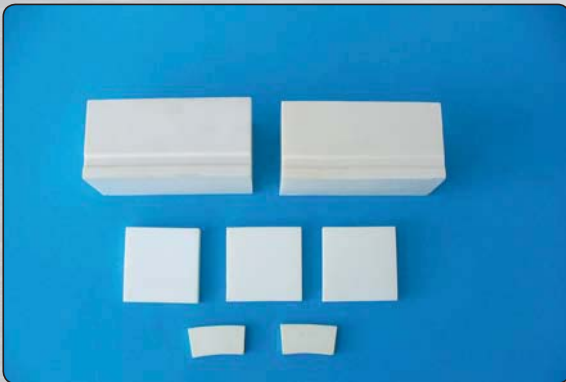
Test is made under following conditions:

- Radiation angle : **30°**
- Pressure : **5 bar**
- Time : **5 minutes**
- Abrasive material : **SiO₂**



CERAMIC LINING FOR LARGE SURFACE

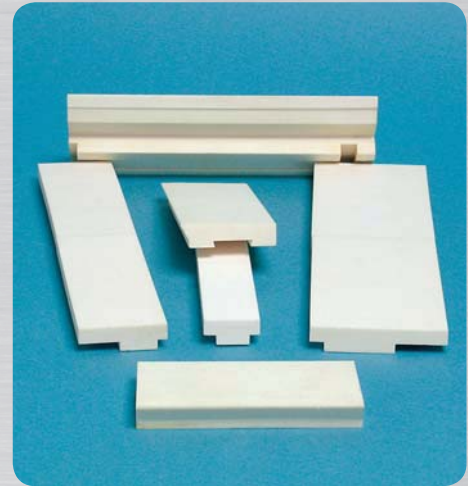
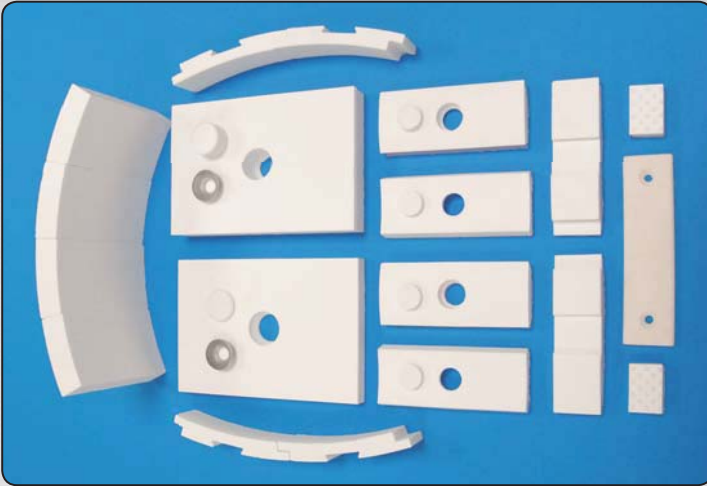
For lining of large surfaces as well as for different shape of surfaces, we use different ceramic tiles (plates) and different mozaics. Material that we use is 92% Al₂O₃, 95% Al₂O₃ and 99,5% Al₂O₃.



We make ceramic tiles (plates) in different sizes and thicknesses; it depends on operating conditions and place where they are mounted. Tiles are fixed with special epoxy glue that has very good properties of fixing.

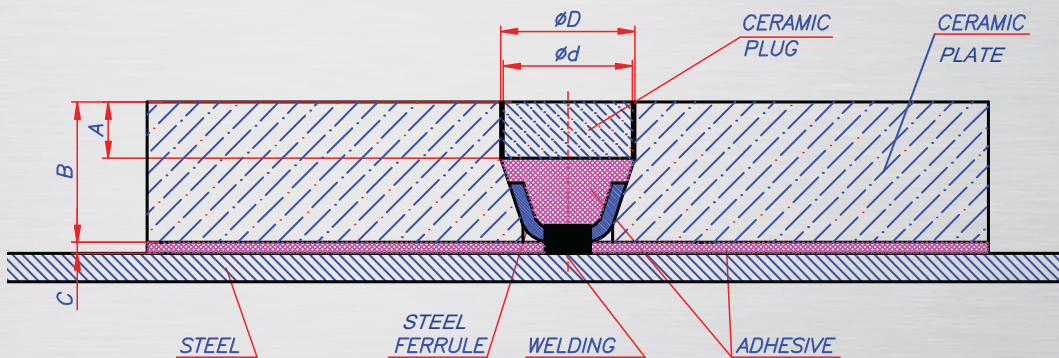


Photos show plates with different shapes for lining of surfaces, which are exposed to abrasion.

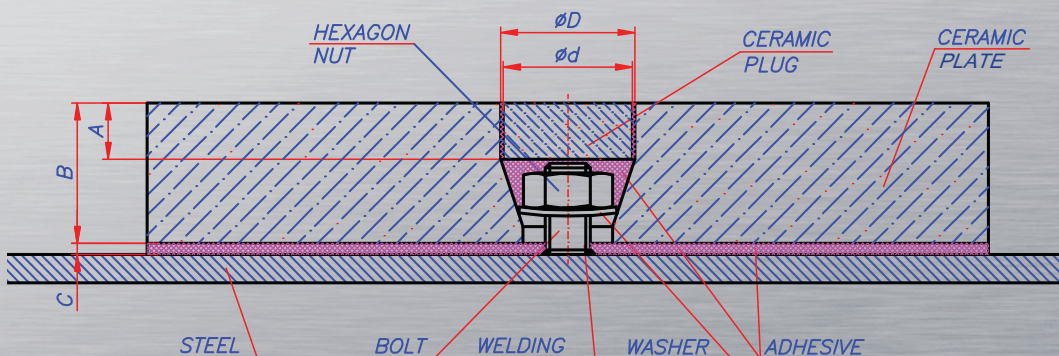


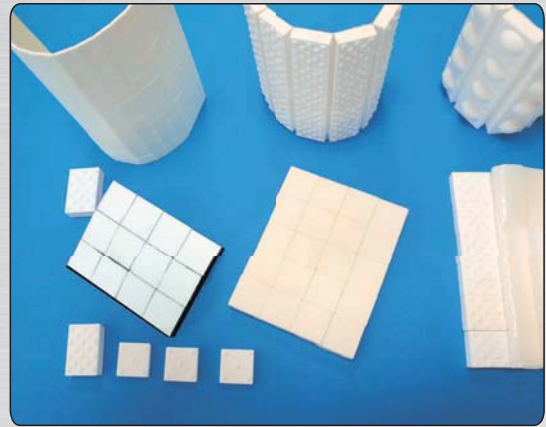
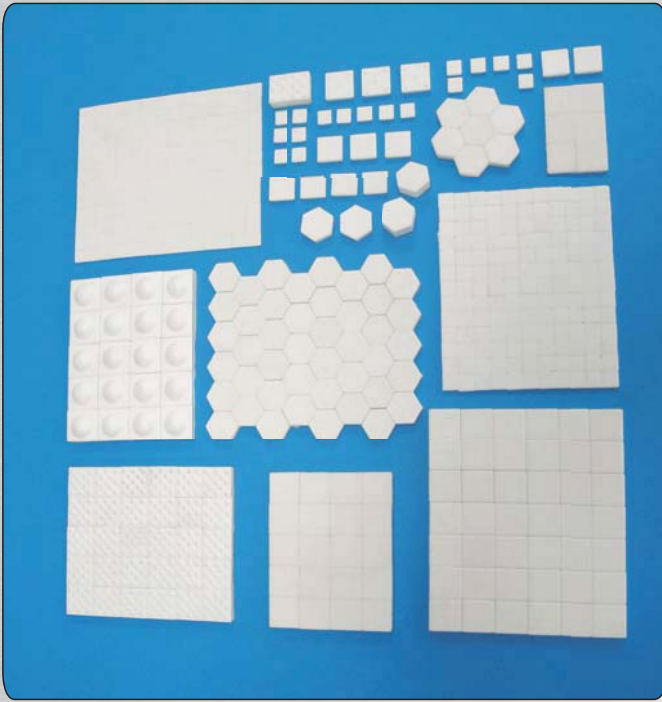
At lining of surfaces, which are exposed to high temperatures and vibrations, epoxy glue is not enough to assure the quality of metal-ceramic. Plates with holes are beside glue, additionally fixed to surface with steel ferrule, which is welded on it, or it is adjusted to surface with screw and nut. Some plates can be adjusted mechanically, because they have swallows tale.

ADJUSTING OF CERAMIC PLATE ON SURFACE WITH WELDING OF STEEL FERRULE

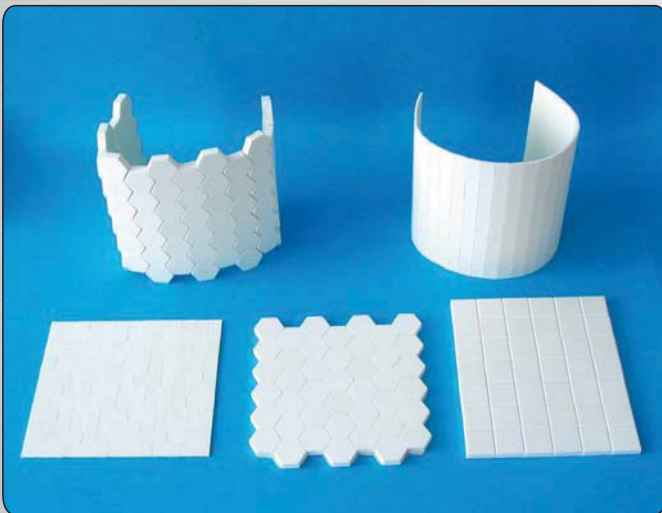


ADJUSTING OF CERAMIC PLATE ON SURFACE WITH SCREW AND NUT





Besides standard panels (mosaics) we produce also special panels, on which ceramic has special shape (different convex parts, nipples). According to customers request we can also vulcanize panels in rubber, which makes the usage of panels bigger, on surfaces which are exposed to different vibrations and punches.



Ceramic mosaics are very suitable for lining of large surfaces, silos, irregular surfaces and many other shapes.

We produce following mozaics:

SQUARE TILES:

Ceramic tiles are glued on special acetat-silk material. The panel is 500 x 500mm large and we make them from following tiles:

10 x 10 mm, thickness: 2mm, 3mm

20 x 20 mm, thickness: 4mm to 12mm

HEXAGONAL (SIX-ANGLE) TILES:

Ceramic hexagonal tiles are glued on special acetat-silk material. The panel is 508 x 490mm large (696 psc of tiles). Type of tiles:

SW 20 mm, (SW = distance between 2 sides), thickness: 4mm to 12mm

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06

Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81

Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижегород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16

Россия (495)268-04-70

Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13

Казахстан (772)734-952-31

Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

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