

**INSULATING & EXTRUDED BRICKS**

**1) Acceptable physical properties**

	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
Bulk density	$\pm 0,10$	$\pm 0,15$	$\pm 0,20$
Cold crushing strength	$\pm 30 \%$	$\pm 35 \%$	$\pm 40 \%$
Permanent linear change	$\pm 0,5$	$\pm 0,75$	$\pm 1$

**2) Acceptable Chemical Analysis**

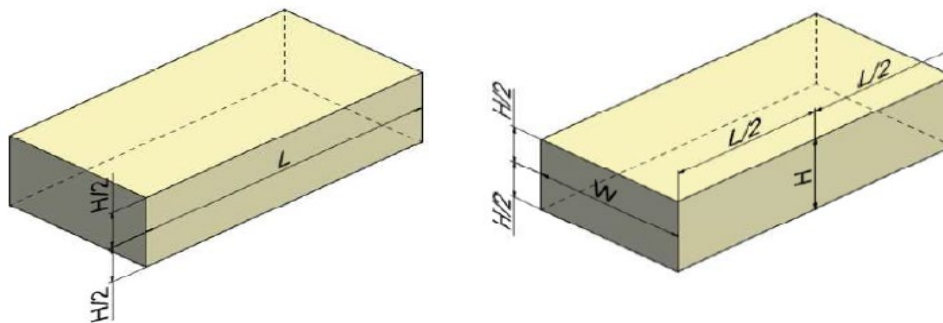
	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
One-component product (>90%) (%)	$\pm 5$	$\pm 5$	$\pm 5$
Main element (>20% < 90%) (%)	$\pm 10$	$\pm 10$	$\pm 10$
Secondary element (>1% <20%) (%)	$\pm 20$	$\pm 20$	$\pm 20$
Micro-component (>1% <20%)	$\pm 0,4$	$\pm 0,4$	$\pm 0,4$

**3) Acceptable dimensional tolerances**

Dimension	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
Lower 100 mm (mm)	$\pm 1$	$\pm 1,5$	$\pm 2$
Between 101 mm ÷ 250 mm (mm)	$\pm 1,5$	$\pm 2$	$\pm 2,5$
Higher 250 mm (%)	$\pm 1$	$\pm 1,25$	$\pm 1,5$
Products rectified or obtained by cutting (mm)	$\pm 1$	$\pm 1,5$	$\pm 2$

### 3.1) Measuring Points

**Length L:** about mid-height of the brick ; **Width W:** about mid-height of the brick; **Height H:** halfway along the length of the brick between the two plane surfaces.



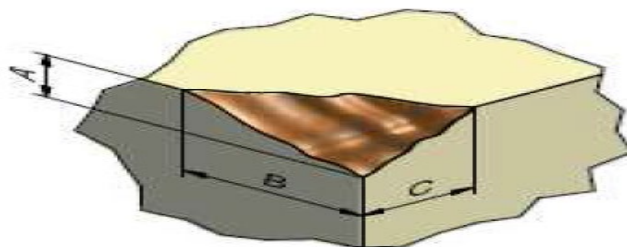
### 4) Acceptable surface defects

The superficial imperfections accepted on the bricks are the following:

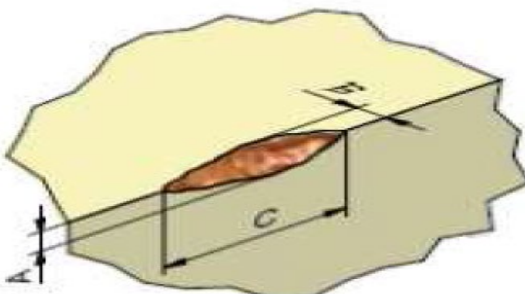
#### 4.1) Corner defects

	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
A or B or C (mm)	$\leq 30$	$\leq 40$	$\leq 50$
A+B+ C (mm)	$\leq 100$	$\leq 120$	$\leq 150$
The total permissible length of defects (mm)	$\leq 120$	$\leq 150$	$\leq 180$

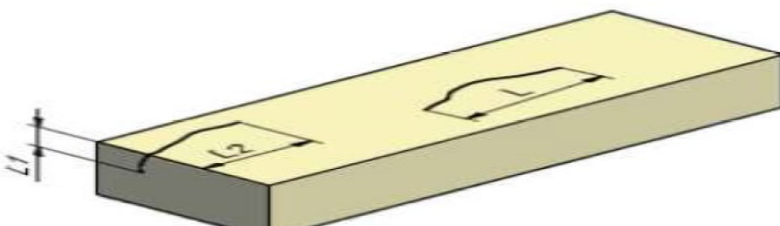
N.B.: Damages of less than 5 mm (A or B or C < 5 mm) are not considered as a defects and are allowed without restrictions.



#### 4.2) Edge defects

		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
A or B	(mm)	$\leq 25$	$\leq 35$	$\leq 50$
Damage length C (of the longest size)	(mm)	$\leq 1/5$	$\leq 1/4$	$\leq 1/3$
N.B.: Damages of less than 5 mm (A or B or C < 5 mm) are not considered as a defects and are allowed without restrictions.				
				

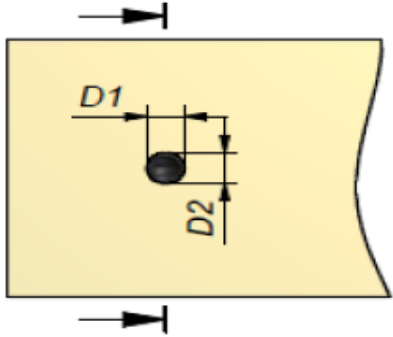
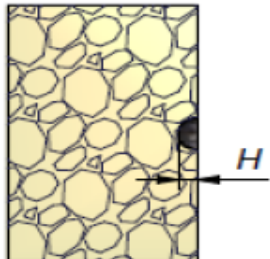
#### 4.3) Acceptable surface cracks

		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
L	(mm)	$\leq 60$	$\leq 75$	$\leq 100$
L <sub>1</sub> + L <sub>2</sub>	(mm)	$\leq 70$	$\leq 85$	$\leq 100$
The width of crack	(mm)	$\leq 0,5$	$\leq 0,7$	$\leq 1$
The depth of crack	(mm)	$\leq 5$	$\leq 7,5$	$\leq 10$
N.B.: Cracks of depth $\leq 2$ mm are allowed without restrictions. Hairline cracks, forming a single grid or cracks on the surface, of a width less than 0,25 mm are allowed without restrictions.				
				

#### 4.4) Melts and craters

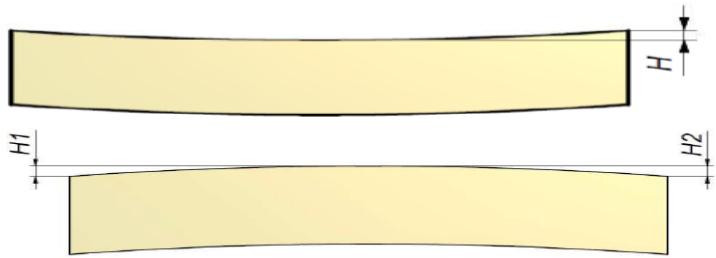
		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
$D = D_1 + D_2$	(mm)	$\leq 15$	$\leq 20$	$\leq 25$
H	(mm)	$\leq 5$	$\leq 7,5$	$\leq 10$

N.B.: Superficial stain, which are not damaging the structure of the product, are not considered as defects and are allowed without restrictions.

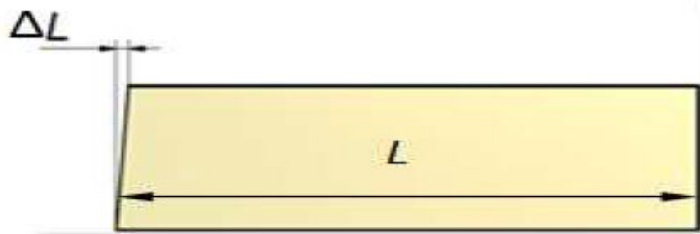



#### 4.5) Deformation

Dimension [ $H = (H_1 + H_2) / 2$ ]		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
$< 200$ mm	(mm)	$\leq 1$	$\leq 2$	$\leq 3$
$\geq 200$ mm (% of a diagonal length)	(%)	$\leq 1$	$\leq 1,25$	$\leq 1,5$



#### 4.6) Rectangularity tolerances

Dimension "L"		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
< 200 mm	(mm)	$\leq 1,5$	$\leq 2$	$\leq 3$
$\geq 200$ mm	(%)	$\leq 1$	$\leq 1,25$	$\leq 1,5$
				

#### 5) Surface of the product

The surfaces of the product must be undamaged, without cracks and slag contamination. Allowed defects are listed in point 4. Deposits from the fuel ash should not be regarded as the slag if the texture of the product is not destroyed.

Andalusite and bauxite products have spots characteristic of this mineral and grade .

Products with different colors are permitted if the material meets the physical and chemical properties.

#### 6) Breakthrough, texture

Surface of the breakthrough should expose the uniform texture without layers and voids. Cracks should not exceed the size limit for the surface of the product.

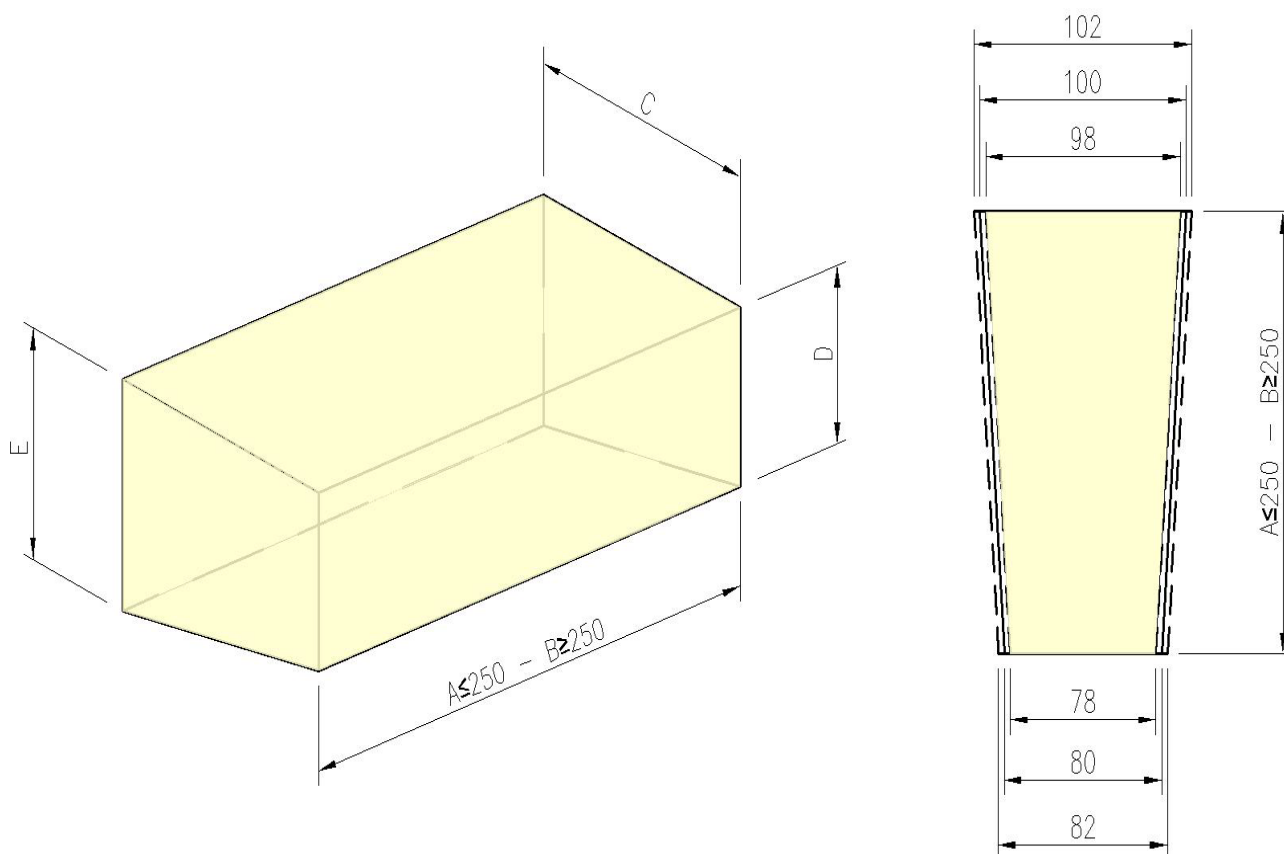
Texture defects are internal cracks, lamination and voids with lengths exceeding 20 mm or several defects greater than 5 mm separated by a distance of less than 20 mm. Texture defects are revealed by:

- On cut faces of bricks for sampling.

If texture defects are revealed the batch concerned shall be assessed by a sequential sampling plan as per ISO 5022 based on an AQL-6,5. Isolated broken out grains shall not be regarded as texture defects.

**7) Tapering for Side-arch , end-arch & arches**

Radial height less		Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
$\leq 250$ mm	(mm)	$\pm 1$	$\pm 1,5$	$\pm 2$
$\geq 250$ mm	(mm)	$\pm 2$	$\pm 2,5$	$\pm 3$



**Example for Arches less than 3 Kg - Tolerances for tapers with:  $\pm 1$  mm and  $\pm 2$  mm**

A $\leq$ 250 mm	Tolerances $\pm 1$ mm	Example of Shape 230x114x100/80	B $\geq$ 250 mm	Tolerances $\pm 2$ mm	Example of Shape 230x114x100/80
Extrados	Intrados	Taper	Extrados	Intrados	Taper
102	82	20	102	82	20
101	82	19	101	82	19
102	81	21	100	82	18
101	8	20	102	81	21
100	81	19	101	81	20
101	80	21	100	81	19
100	80	20	99	81	18
99	80	19	102	80	22
100	79	21	101	80	21
99	79	20	100	80	20
98	79	19	99	80	19
99	78	21	98	80	18
98	78	20	101	79	22
			100	79	21
			99	79	20
			98	79	19
			100	78	22
			99	78	21
			98	78	20

The sampling plan for non-destructive testing in accordance with AQL = 6,5 %			
1	2÷15	2	0
2	16÷50	8	1
3	51÷90	13	2
4	91÷150	20	3
5	151÷280	32	5
6	281÷500	50	7
7	501÷1200	80	10
8	1201÷3200	125	14
9	> 3200	200	21