



**TOLERANCES RANGE
FOR INSULATING BRICKS
Chemical Properties
Dimensional Deviations**



Date of issue: 01.01.2017

Acceptable Surfaces Defects & Others

Doc. N.: 01 - Rev. 00

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	$\pm 0,5$	$\pm 0,75$	± 1

2) Acceptable Chemical Analysis

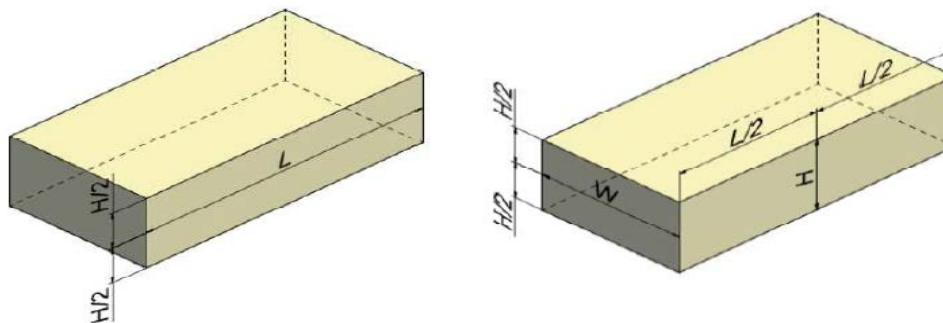
	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
One-component product (>90%) (%)	± 5	± 5	± 5
Main element (>20% < 90%) (%)	± 10	± 10	± 10
Secondary element (>1% < 20%) (%)	± 20	± 20	± 20
Micro-component (>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)	± 1	$\pm 1,5$	± 2
Between 101 mm ÷ 250 mm (mm)	$\pm 1,5$	± 2	$\pm 2,5$
Higher 250 mm (%)	± 1	$\pm 1,25$	$\pm 1,5$
Products rectified or obtained by cutting (mm)	± 1	$\pm 1,5$	± 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.



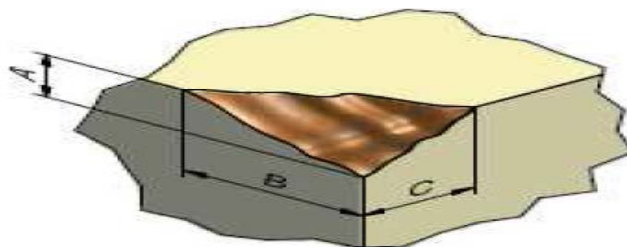
4) Acceptable surface defects

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)	≤ 30	≤ 40	≤ 50
A+B+ C (mm)	≤ 100	≤ 120	≤ 150
The total permissible length of defects (mm)	≤ 120	≤ 150	≤ 180

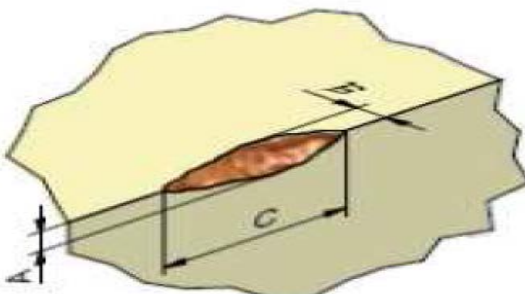
N.B.: Damages of less than 5 mm (A or B or C < 5 mm) are not considered as a defects and are allowed without restrictions.



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)	≤ 25	≤ 35	≤ 50
Damage length C (of the longest size)	(mm)	≤ 1/5	≤ 1/4	≤ 1/3

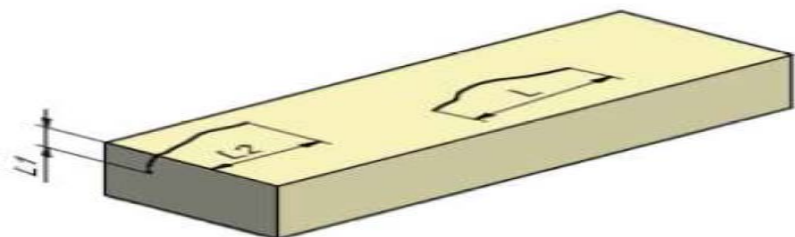
N.B.: Damages of less than 5 mm (A or B or C < 5 mm) are not considered as a defects and are allowed without restrictions.



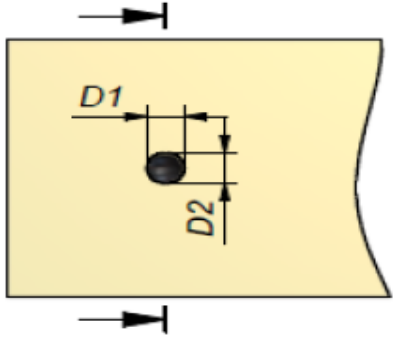
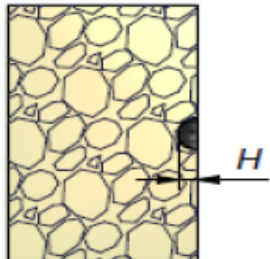
4.3) Acceptable surface cracks

		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)	≤ 60	≤ 75	≤ 100
L ₁ + L ₂	(mm)	≤ 70	≤ 85	≤ 100
The width of crack	(mm)	≤ 0,5	≤ 0,7	≤ 1
The depth of crack	(mm)	≤ 5	≤ 7,5	≤ 10

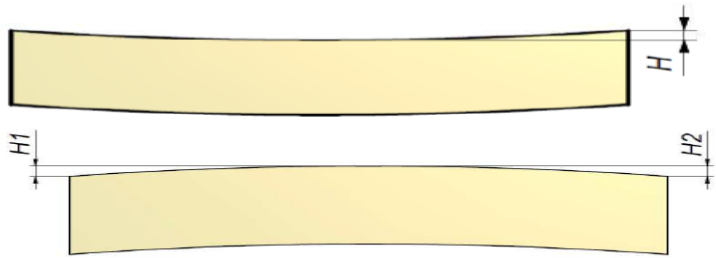
N.B.: Cracks of depth ≤ 2 mm are allowed without restrictions. Hairline cracks, forming a single grid or cracks on the surface, of a width less than 0,25 mm are allowed without restrictions.



4.4) Melts and craters

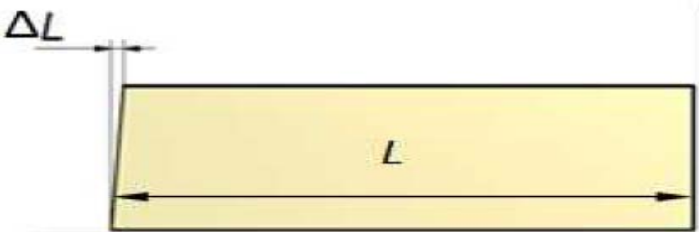
	Standard straight bricks less than 3 Kg	Other standard shapes more than 3 Kg and up to 15 Kg	Large shapes more than 15 kg. Itemized & special shapes
D= D ₁ +D ₂ (mm)	≤ 15	≤ 20	≤ 25
H (mm)	≤ 5	≤ 7,5	≤ 10
<p>N.B.: Superficial stain , which are not damaging the structure of the product, are not considered as a defects and are allowed without restrictions.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>			

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)	≤ 1	≤ 2	≤ 3
≥ 200 mm (% of a diagonal length)	≤ 1	≤ 1,25	≤ 1,5
<div style="text-align: center;">  </div>			

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)	≤ 1,5	≤ 2	≤ 3
≥ 200 mm	(%)	≤ 1	≤ 1,25	≤ 1,5
(% of dimension L)				



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.

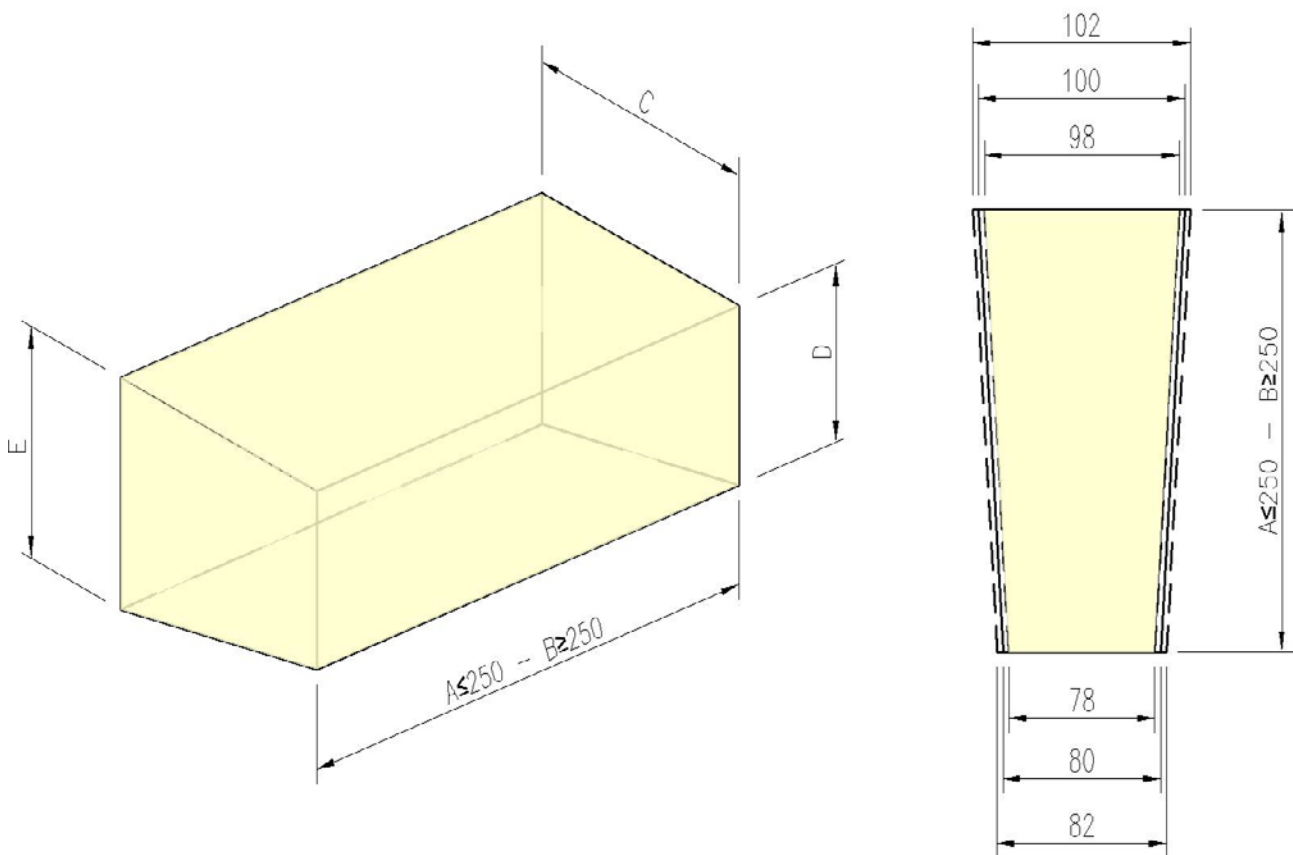
Texture defects are internal cracks, lamination and voids with lengths exceeding 20 mm or several defects greater than 5 mm separated by a distance of less than 20 mm. Texture defects are revealed by:

- 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
≤ 250 mm	(mm)	± 1	± 1,5	± 2
≥ 250 mm	(mm)	± 2	± 2,5	± 3





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Example for Arches less than 3 Kg - Tolerances for tapers with: ± 1 mm and ± 2 mm

A \leq 250 mm	Tolerances ± 1 mm		Example of Shape 230x114x100/80	B \geq 250 mm	Tolerances ± 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



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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