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Corundbaddeleyit ceramics KARKOR

Products for steel mills 2
Products for glass mills 2
Products for chemical industry 3
Thin wall ceramics 3

Contact address 4
Material sheet of the product 4

Products for steel mills

- floors for percussion furnaces
- floors for walking-beam furnaces
- slides for sintering furnaces
- grates for separation of coke
- brick linings of recuperative furnaces

Products for glass mills

- brick linings of furnaces
- special parts for burners
- vaults of inlet and outlet gaps
- tanks for batch production
- floors of pot furnaces
- brick linings of recuperative furnaces
- mixers

Products for chemical industry

- brick lining of tanks for storage of corrosive materials
- mixers

Thin wall ceramics

- tiles for lining of separators
- tubes in different shapes for transport of abrasive materials

KARKOR is electrically melted corundbaddeleyit material. This material is produced by melting in three phase arc furnace in temperatures reaching upto 2.000 degrees C and consequent casting into sand or steel moulds. The main advantage of this product is resistence against abrasive wear even in high temperature environment, heat and chemical resistance.

As a result of these technical characteristics it finds wide range of applications in glass, steel and chemical industries as well as in pneumatic or hydraulic transport of abrasive materials.

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Material sheet of the product

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MATERIAL SHEET OF THE PRODUCT

1. Identification of material or preparations and production company

1.1 Chemical name of the material or trade name of the product:
Electrically melted cast korundbaddeleyit material KARKOR.
Identification according to Czech norm ČSN EN 12475-4: **AZS 30**

1.2 Characteristics of application of the material or preparation:
Steel, glassware and extraction industries.

1.3 Identification of production company:
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2. Identification of risks
2.1 Classification of the product: inert ceramics material
2.2 The most important adverse effects on human health: not stated
2.3 The most important adverse effects on environment: not stated
The product is fully recydable, biologically not removable.

3. Composition or information of components
The product doesnot contain dangerous materials according to the relevant law.

Characteristics	Test procedure	Required level
Contents ZrO_2	ČSN P ENV 955-4	min 30 % max 40 %
Contents Al_2O_3	ČSN P ENV 955-4	min 30 % max 55 %
Contents SiO_2	ČSN P ENV 955-4	max 20 %
Contents of residues	ČSN P ENV 955-4	max 1,3 %

4. First aid instructions
It can occur only mechanical injury during contact with the material. Treatment by usual procedure.

5. Arrangement for liquidation of fire
The material is heat resistant, it doesnot burn.

6. Arrangement in case of accidental leakage
In wiev of the fact that the material is solid, the leakage cannot exist.
The surrounding fire can be liquidated by known extinguishers.

7. Handling and storage
The material is fragile and breakage can happen by collision with solid object.
The storage is not influenced by environment.

8. 8. Exposure limitation, Personal means of protection
Protection of hands and body: Appropriate work gloves, appropriate work clothing and work shoes.
In wiev of characteristics of the material there is no danger of exposure by other means.
The limitation of exposure of the environment: not stated

1

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9. Physical and chemical characteristics

Characteristics	Prescription	Required level	Test result
Contents ZrO_2	STO 030-038 227	min 30 % max 40 %	34,5 %
Contents Al_2O_3		min 30 % max 55 %	52,7 %
Contents SiO_2		max 20 %	11,7 %
Contents of residues		max 1,3 %	1,1 %
Fictive porosity		max 13 %	2,6 %
Real porosity		max 16 %	9,1 %
Specific weight		min 3300 kg/m^3	3956 kg/m^3
Volume weight		min 3200 kg/m^3	3361 kg/m^3
Stability in pressure		min 200 MPa	264 MPa
Flexural strength		min 30 MPa	41 MPa
Heat resistance		175 (1750) °C	175
Abrasivity		80 mm^3	42 mm^3
Durable length changes in heat after 1500 °C / 5 hours		max ±1 %	+0,96 %
Coeficient of heat elasticity (20–1000 °C)		$(8{\cdot}10^{-6} \pm 1{\cdot}10^{-6})$ K^{-1}	$8{,}38{\cdot}10^{-6}$

9.1 General information
State (by 20 °C): solid
Colour: light yellow upto light pink
Smell: without
Melting temperature: approx 1700 °C
Inflammability: non inflammable

9.2 Further information
The material is cast to the moulds made of sand or steel.
The structure of the surface is more delicate by application of the mould made of sand and as consequence of slower cooling down it is on the surface as well as in the interior of the material ZrO_2 in monoclinic form (baddeleyit). This surface is to be machined additionally.
By the application of moulds made of steel it comes into being the microcrystalic tetragonal modification ZrO_2 as a consequence of more rapid cooling down procedure. This surface is harder and doesnot enable further machining.

10. Durability and reactivity
It is stable in normal conditions.

11. Toxikologické informace
11.1 Acute toxicity: none
11.2 $LD50_{\text{oral,rat}}$ **(mg·kg^{-1}):** not stated
11.3 $LD50_{\text{dermal, rat or rabbit}}$ **(mg·kg^{-1}):** not stated
11.4 $LD50_{\text{inhalation rat aerosols or partides}}$**:** not stated
11.5 $LD50_{\text{inhalation rat-gas and vapour}}$**:** not stated
11.6 Subchronic-chronis toxicity: not stated
11.7 Sensibilisation: not stated
11.8 Carcinogenity: not stated
11.9 Mutagenity: not stated
11.10 Toxicity for reproduction: not stated

12. Ecologic information
There is no known harmful influence on environment. It concerns animals as well as human beings.

13. Information on neutralisation of the material
13.1 Means of neutralisation of the material: The material is fully recyclable by the production company.
13.2 Further data: The removal of waste is regulated by law No. 185/2001 Sb.in wording of later regulations.

2