P-D REFRACTORIES is your powerful and competent partner for refractory solutions. We serve our customers with a wide product range from standard firebricks, high-alumina products such as sillimanite bricks, mullite bricks, bauxite bricks and corundum bricks to special products containing zirconium, chromium material and silicon carbide. Our products cover nearly all industrial applications involving high temperature processes and those where high wear resistance is demanded. We offer tailor-made solutions for all industries – especially for the glass industry, the aluminium industry, the cement industry, the steel industry, the coke industry and for industrial furnace construction.

We are now one of the leading refractory manufacturers in Europe based on decades of experience, know-how and competitiveness. Working in partnership with our customers, targeted research and flexibility are equally important pillars of our work. The product range is constantly adapted to the market conditions and currently covers more than 15,000 different products.

P-D REFRACTORIES employs 1,300 people and operates several plants in Europe. As a group we stand for strength, competence, performance and safety.

» WE SERVE THE ALUMINIUM INDUSTRY

www.pd-refractories.com
Aluminium is an important material for innovative applications whether in the area of vehicle construction, the building industry, the packaging industry or high-tech areas. Sensitive and sophisticated in production and processing, it needs a solid manufacturing base. We are fully conversant with the demanding requirements of the aluminium industry and supply a broad range of customer oriented and applied solutions.

You can rely on us: every single of our refractory brick has been hand-selected and approved for our well-known quality standard. Our quality is certified since we work strictly by ISO 9001 standards. Beyond our standard program we offer special solutions to meet your individual specifications and expectations. Whether for open or closed baking furnaces, reduction cells and holding / melting furnaces – our brick lining will be tailored to suit your product needs.

We know the aluminium industry from bottom to top and understand how important it is to ensure the highest quality for a continuous and successful aluminium production.
P-D Refractories is one of the most important worldwide suppliers of high-quality refractories for open and closed anode baking furnaces. Our bricks reached a lifetime of more than 180 firecycles at different smelters.

The know-how, we acquired in the aluminium industry over decades, and advanced manufacturing technologies combined with our continuous activities to meet our customers’ needs are the basis for the success of our refractory bricks in flue and head walls of anode baking furnaces.

Let us convince you of our performance, as we already did with a variety of customers in the primary aluminium industry within the last decades.

ANODE BAKING FURNACE

Product Highlight

Our answer to the global increase of energy prices: IK50VP, the new generation of flue wall brick with a higher thermal conductivity to decrease your furnace’s energy consumption.
## Refractory Products for Anode Baking Furnaces

### Materials

<table>
<thead>
<tr>
<th>Materials</th>
<th>Flue Wall</th>
<th>Head Wall</th>
<th>Tie Bricks</th>
<th>Pit Floor</th>
<th>Burner Bricks</th>
<th>Mortar</th>
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</table>

Certified according to DIN ISO 9001

### References

- Al Mahdi
- Alcoa
- Aluminerie Alouette
- Aluminium Bahrain
- BHP Billiton
- Dubai Aluminium
- Egyptalum
- Emirates Aluminium
- Hydro Aluminium
- Kazakhstan Aluminium
- Qatar Aluminium
- Rio Tinto Alcan
- Sohar
- Tomago Aluminium
- Trimet Aluminium
- Venalum

www.pd-refractories.com
Innovations of Flue caps for Anode Baking Furnaces from P-D Refractories CZ.

Anode Baking Furnace (ABF) produces carbon anodes for electrolytic production of primary aluminum. Top-blocks are integral part of the anode furnace linings and therefore must meet demanding requirements, so that their service life is in accordance with the life of other refractory materials used in these furnaces. Top blocks are large-sized fittings weighing up to 1000 kg, which are used in the ABF for closing and strengthening heating walls to bind the heating wall with the frame and also to fit the heating and flue gas system. They are often difficult shapes with large openings and comprise elements allowing their manipulation by lifts. Blocks must have high strength, wear resistance, abrasion resistance, thermal shock resistance and must withstand high temperatures in a reducing atmosphere. Blocks must be dimensionally accurate and have defined surface to be safely walkable.

For the production of top blocks in P-D Refractories CZ we use dense castables (RCC) vibrated into moulds. Top blocks made of these materials meet the specifications for the construction of ABF, but typical properties of these materials do not allow their use in the most stressed points and also do not increase the lifetime. Typical properties of dense castables are given by higher content of calcium aluminate cement, and result in a significant reduction in modulus of rupture (MOR), but also lower cold crushing strength (CCS) at temperatures of 800 °C to 1100 °C by disintegration of hydraulic binding alumina cement. To achieve the desired stability and durability, these blocks have to be manufactured with steel frames on the upper edges of blocks. These frames protect the edges against wear and to compensate for the lower strength and abrasion resistance castable. Furthermore, these blocks internal frames from refractory steel, which reinforce the weakened portion around most stressed openings for burners.

P-D Refractories CZ therefore offers top blocks produced by casting from improved low-cement (LCC) and ultralow-cement (ULCC) plasticized mixtures. The thus produced top blocks show no decrease in strength during heating, have up to 3 times higher compressive strength (MOR; HMOR) and cold crushing strength (CCS), generally higher abrasion resistance, which is caused by material composition, wherein the bond is formed by addition of a small quantity of alumina cement also other soft matrix and a plasticizer, together with a minimum amount of water creates a self-flowing mixture. The great advantage is, the capability of firing these at 1000 °C. This means, after firing, the physicochemical properties are stabilized and blocks ready to be used, there is no risk of cracking due to thermal exposure. The removal of the steel frame allows us to use higher quality raw material without any price increase of the final product. And by increasing the physical properties of the product, the protection of the steel frame is not necessary anymore. The best material for the production of top blocks is KS70F that has to high strength and very low thermal expansion.
Refractory Products for Top Blocks For Anode Baking Furnaces

Materials

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<td>ZBH145-TB</td>
<td>●</td>
</tr>
</tbody>
</table>

References

- Alcoa
- Pacific Aluminium
- Emal
- Dubal
- Rio Tinto

Certified according to DIN ISO 9001
P-D Refractories belongs to the most competitive suppliers of high-quality refractories for the primary aluminium industry. One of our specialties for this segment is the barrier-brick lining of reduction cells. The reduction cells for pots are the centre of the aluminium smelting process. Customers from all over the world rely on our well-known qualities.

**Product Highlight**

Practical long-term applications confirm that our BB20/BB80-barrier system represents a reliable protection for the cell bottom insulation. This penetration barrier is an effective combination of two very different aluminosilicate refractory brick types with a corrosion behaviour which is especially harmonized to each other.
Certified according to DIN ISO 9001

References

Alcoa
EGA
Qatalum
Alba
Rio Tinto
Trimet Aluminium
Al Mahdi Aluminium
Aluminerie Alouette
Aluminij Mostar
Pacific Aluminium
South 32
Valesul
Venalum

Otto21 / BB80 / BB20 / SA

SL5-90E / SL11P-110 / SL7-95

PFO 1-3 / AT-Mix

PD-SIC 75

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» ALUMINIUM INDUSTRY

We have an ongoing research & development program aimed at evolution of more cost-effective refractories for the aluminium industry.

The technological focus is on premium-grade materials which are needed to fulfill the market requirements such as longer furnace campaigns and higher furnace performance. Our in-house technology centre is well equipped. All relevant required destructive tests (e.g. chemical analysis, RUL, HMOR, creep in compression etc.) can be done in our own laboratories.
Quality in Refractories

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