From Bauxite to Aluminum to Anodes
4 to 5 tons of Bauxite
  = 2 tons of Alumina
  = 1 ton of Aluminum.
  = 0.5 ton of Anodes

Energy Usage
+/- 14 MegaWatt is used for 1 ton of Aluminum

Production of primary aluminum takes place in large production lines. The primary smelter process transforms refined alumina into aluminum. To do this three different raw materials are required:
  • Aluminum oxide (Alumina)
  • Electricity
  • Carbon

The aluminum atom in alumina is bonded to oxygen. These bonds have to be broken by electrolysis to produce aluminum metal:
  • Alumina is dissolved in an electrolytic bath.
  • In the electrolytic cells, a very high direct current of +/- 200 Kilo Ampere is run through the alumina/cryolite mixture between a negative cathode and a positive anode, both made of carbon.
  • The anode is consumed in the process, as it reacts with the oxygen in the alumina to form CO2.
  • Liquid aluminum is drawn from the cells using specialized vehicles and is cast into extrusion ingots, sheet ingots or other ingots, depending on how it will be processed further.
Anodes
Anode making process

- Anodes are carbon blocks used as conductors in the electrolysis process by which aluminum is produced.
- The raw materials used in the production of anodes are petroleum coke, coal tar pitch and anode butt residues. These raw materials are combined after various operations and the mixture is then vibrated until the desired shape in a mold.
- The anode is then baked to a temperature of 1090 °C for two weeks.
- The anode now possesses the properties that are important for the customer, such as density, conductivity, and reactivity.
- After baking, the anode is slotted and packed and put on transport to the customer.
Raw Materials
Anode making

- Paste making Tower
- Transporting green anodes to store by Lift
- Cooling tunnel
Store (Green & Baked)

Green Anodes to baking furnace

Baked Anodes to Slotting machine
Furnace C

- Demolition
- Side Wall Insulation
- Installation of flue walls
- Finished section
- Cross-over
- Inlets for Cross-over
Slotting and Shipping
Anodes arrive by ship at Norðurál
Potrooms Norðurál
Websites

- www.centuryvlissingen.nl
- www.centuryaluminum.com
- www.nordural.is