

## CAI-ALON – Raw Material for Manufacturing Cement

### Introduction

CAI-ALON is a high alumina material that is produced from Aluminium smelting process. It is made from low cost, high alumina content raw materials and has certain availability. With respect to the increased trend of recycling of Aluminum and the reprocessing of its recycling waste it is produced in major quantities and is fully used by the manufacturers of cement clinker and mineral wool. A multi dimensional utility of this product is under development such as use in the refractory and steel industries. The Similar type of material is used by many cement manufacturers across the globe especially in Europe. Further references of the manufacturers using can be provided on request.

### Description

- CAI ALON is a high grade artificial Alumina-bearing material containing about 75-85% Al<sub>2</sub>O<sub>3</sub> (Dry Condition, attached is the typical specification). It is superior to metallurgical Bauxite concerning the chemical Al<sub>2</sub>O<sub>3</sub> content on dried basis.
- CAI-ALON mainly consists of alumina minerals like Bayerite, corundum and Spinel.
- CAI-ALON can introduce Alumina into any raw material mixings for ceramics, refractory materials, cement clinker, mineral wool, synthetic calcium aluminates lags and thereby substitute common alumina raw materials like Bauxite.
- CAI-ALON can improve the whiteness of burned products compared to other raw materials those are rich in iron oxide content.
- CAI-ALON has fineness similar to cement powder. Therefore it consumes less comminution energy than lumpy Al<sub>2</sub>O<sub>3</sub> raw materials during the grinding process.
- CAI-ALON can be mixed with other fine grained raw materials and / or binders to form pellets or bricks.

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### PORTLAND CEMENT CLINKER

Every cement needs to contain alumina bearing minerals like calciumaluminaterrite and tricalciumaluminate. To form these minerals the clinker burning process has to be fed with suitable materials containing a certain amount of Al<sub>2</sub>O<sub>3</sub>.

#### Range of Portland cement composition, mass %

<b><i>CaO</i></b>	<b><i>60-70%</i></b>
<b><i>SiO<sub>2</sub></i></b>	<b><i>18-24%</i></b>
<b><i>Al<sub>2</sub>O<sub>3</sub></i></b>	<b><i>4-8%</i></b>
<b><i>Fe<sub>2</sub>O<sub>3</sub></i></b>	<b><i>1-4%</i></b>
<b><i>MgO<sub>2</sub></i></b>	<b><i>0.5-4%</i></b>
<b><i>SO<sub>3</sub></i></b>	<b><i>2-3.5%</i></b>

### Benefits of using CAI-ALON as RAW BAUXITE substitute.

- CAI-ALON can be used as an alumina raw material like bauxite and clay etc. to introduce Al<sub>2</sub>O<sub>3</sub> into the clinker burning process of the cement kiln.
- If there is any need of raising the Al<sub>2</sub>O<sub>3</sub> content of the usual kiln feed raw meal CAI-ALON can be mixed with the crusher run stone from the quarry respectively with the raw meal mill feed or with the feed material of the pre-heater system of the cement kiln.
- Due to its slight content of fluorspar CAI-ALON can initiate the forming of the compound 11CaO.7Al<sub>2</sub>O<sub>3</sub>.CaF<sub>2</sub> within the clinker. Thereby CAI-ALON can bring an additional improvement of the strength of the concrete.
- CAI-ALON can lower the burning temperature or the melting temperatures of the cement clinker due to its special reactivity.
- Usually the amount of CAI-ALON added to the cement kiln feed ranges from 1 up to 5 mass percent.

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- Dried and calcined CAI-ALON also can be used as filler like fly ash to be added to the cement meal up to 15 mass percent without any detrimental influence on the concrete strength. Thereby costs for cement can be saved.

### Qty to use

- Usually the amount of CAI-ALON added to the cement kiln feed ranges from 1 up to 5 mass percent.
- CAI-ALON should be used in the formulation of grinding mix as half the amount of raw bauxite as it has double the percentage of Al<sub>2</sub>O<sub>3</sub>. (Raw bauxite 45% of Al<sub>2</sub>O<sub>3</sub> and CAI-ALON 80% of Al<sub>2</sub>O<sub>3</sub>).

### Storage

**CAI-ALON** should be stored under dry covered conditions.

### Shelf Life

One year if stored under dry, covered conditions free from moisture and water.

### Packing

1 MT jumbo bags or as requested by the customer.