

Product Name: HiCAI-S 10 mm

Product Description: A mineral product rich in fluoride, sodium and alumina. Designed for use in cement clinker manufacture. The presence of fluoride may result in a beneficial fluxing and/or mineralisation effect that reduces firing temperature and promotes desired phase formation in manufacture of cement clinker. The presence of sodium may improve the burning process and sulphur binding thereby improving kiln operation and clinker quality. The presence of alumina may substitute other types of correctives used for raw mix preparation.

Chemical Composition of HiCAI-S

Description	Unit		Test Method
Carbon	%	5 to 10	Liebig technique to Australian Standard AS2434.6
Calorific Value	GJ/t	n.a.	Calorimeter to Australian Standard AS1038.5
Silicon	as SiO ₂	%	12 to 20
Aluminium	as Al ₂ O ₃	%	25 to 30
Iron	as Fe ₂ O ₃	%	6 to 11
Calcium	as CaO	%	1 to 4
Magnesium	as MgO	%	0 to 3
Sulphur	as SO ₃	%	0 to 2
Potassium	as K ₂ O	%	0 to 2
Sodium	as Na ₂ O	%	23 to 28
Fluoride	total as F	%	12 to 16

Inductively Coupled Plasma Spectroscopy (ICP/OES)
Ion Selective Electrode (ISE)

See following page for trace element analysis.

Particle Size Distribution

Sieve Size	Unit	HiCAI-S
> 8 mm	%	0 to 2
8 to 3 mm	%	0 to 5
3 to 1 mm	%	10 to 25
1 to 0.5 mm	%	15 to 30
< 0.5 mm	%	40 to 70

Bulk Density

10 mm minus product has a dry bulk density (loose) of 1.3 tons per cubic meter.

Grindability Index

HiCAI-S grindability index (measured as Hardgrove Grindability Index) is above 50.

Analysis of Trace Elements

Description	Unit	Amount	Test Method		
Mercury	Hg	mg/kg	<0.2	Atomic Absorption Spectrometry (AAS) cold vapour generation	
Antimony	Sb	mg/kg	<10		
Arsenic	As	mg/kg	<50		
Barium	Ba	mg/kg	<10		
Beryllium	Be	mg/kg	<10		
Cadmium	Cd	mg/kg	<10		
Cobalt	Co	mg/kg	<50		
Chromium	Cr	mg/kg	<150		Inductively Coupled Plasma Spectroscopy (ICP-OES)
Copper	Cu	mg/kg	<350		
Manganese	Mn	mg/kg	<1000		
Nickel	Ni	mg/kg	<500		
Lead	Pb	mg/kg	<100		
Selenium	Se	mg/kg	<5		
Tin	Sn	mg/kg	<20		
Thallium	Tl	mg/kg	<5		
Vanadium	V	mg/kg	<200		
Zinc	Zn	mg/kg	<100		

Mineralogical Composition

Main minerals that may be found in HiCAI-S are Cryolite (Na_3AlF_6), Villiaumite (NaF) and Nepheline ($\text{Na}_3(\text{Na,K})\text{Al}_4\text{Si}_4\text{O}_{16}$). Minor minerals may include Fluorite (CaF_2), Corundum (Al_2O_3), Diaoyudaoite ($\text{NaAl}_{11}\text{O}_{17}$), Mullite ($3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$) and other crystalline and amorphous phases.

Transport, Handling and Storage

HiCAI-S is not regulated for transport as dangerous good.

- Can be stored against typical steel, concrete and aluminium surfaces.
- Contains soluble fluoride, any water that comes in contact must be contained with the HiCAI-S material.
- Do not mix with acid as noxious gas may be produced.

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