Technical Data Sheet
HiCAl 40 Mineralising Carbon

Product Name: HiCAl 40 10 mm

Product Description: A mineral product rich in fluoride, sodium, alumina and carbon. 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 carbon may substitute other types of fuels used for clinkerization.

Chemical Composition of HiCAl 40

Description		Unit		Test Method
Carbon		%	40 to 45	Liebig technique to Australian Standard AS2434.6
Calorific Value		GJ/t	> 12	Calorimeter to Australian Standard AS1038.5
Silicon	as SiO_2	%	6 to 12	Inductively Coupled Plasma Spectroscopy (ICP/OES)
Aluminium	as Al_2O_3	%	16 to 21	
Iron	as Fe_2O_3	%	2 to 7	
Calcium	as CaO	%	1 to 3	
Magnesium	as MgO	%	0 to 1	
Sulphur	as SO_3	%	0 to 2	
Potassium	as K_2O	%	0 to 1	
Sodium	as Na_2O	%	14 to 19	
Fluoride	total as F	%	8 to 12	Ion Selective Electrode (ISE)

See following page for trace element analysis.

Particle Size Distribution

Sieve Size	Unit	HiCAl 40
> 8 mm	%	0 to 5
8 to 3 mm	%	0 to 10
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

HiCAl 40 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	Inductively Coupled Plasma Spectroscopy (ICP-OES)
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	
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 HiCAl 40 are Cryolite (Na_3AlF_6), Villiaumite (NaF) and Graphite (C). Minor minerals may include Nepheline ($Na_3(Na,K)Al_4Si_4O_{16}$), Fluorite (CaF_2), Corundum (Al_2O_3), Diaoyudaoite ($NaAl_{11}O_{17}$), Mullite ($3Al_2O_3 \cdot 2SiO_2$) and other crystalline and amorphous phases.

Transport, Handling and Storage

HiCAl 40 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 HiCAl 40 material.
- Do not mix with acid as noxious gas may be produced.