

# UltraTech Cement Limited

Unit: Vikram Cement Works

*The Less You Burn, the More You Earn..*

**Circular Economy Initiatives & Aluminium industry**

- Aluminium sector wastes : Successful usage of red mud by cement industry.
- Red mud- Five million tonne of red mud each year in India.
- Dross- India produces around 0.12 million tonne of dross in a year- a potential to work out if cheaper.
- Aluminium slag- 15-30% aluminium oxide, 30-55% sodium chloride, 15-30% potassium chloride, 5-7% metallic aluminium and impurities.
- Flue gas dust and other particulates
- SPL- 35,000 SPL each year.



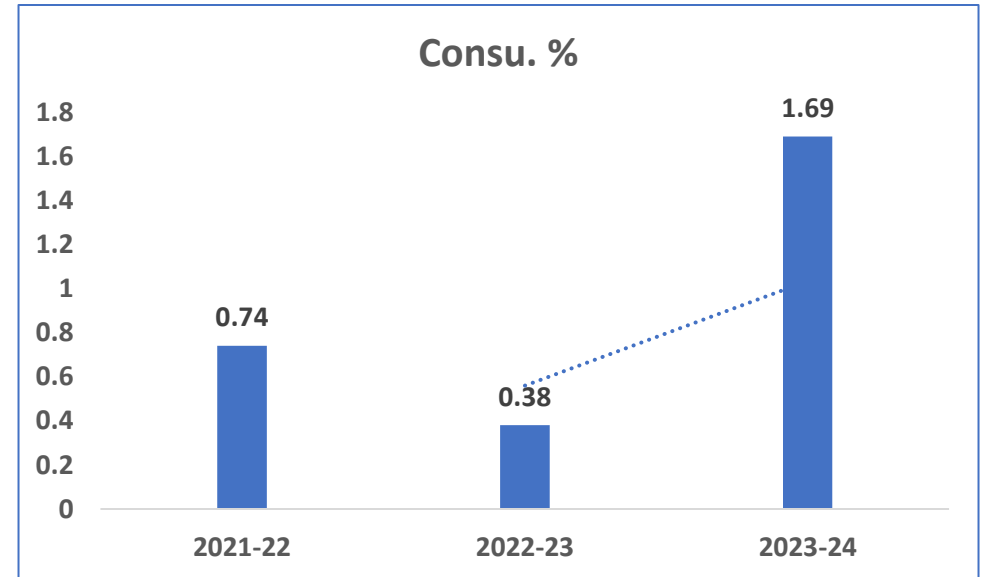
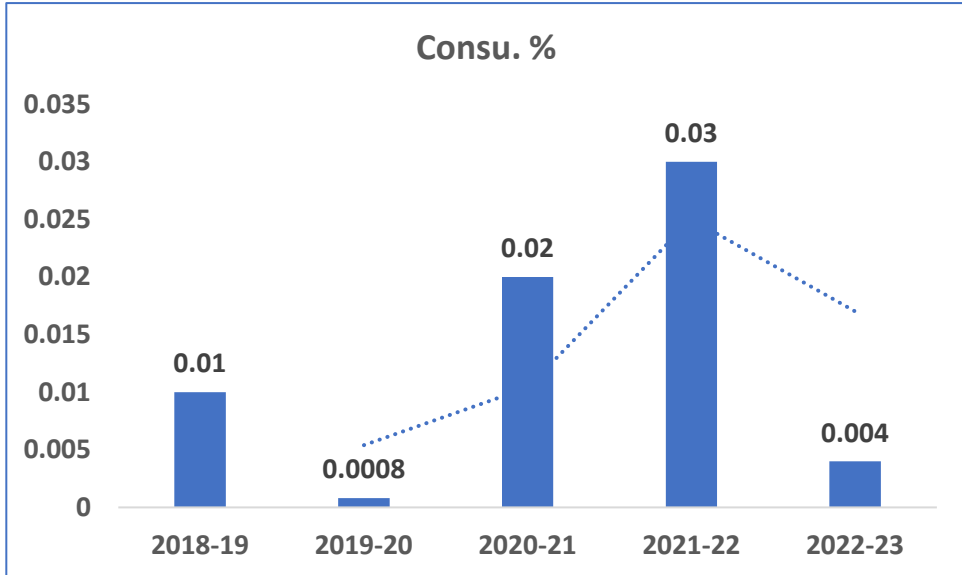
# Utilization of Alteranate Raw material in Vikram



AR material name	Alternate of	Started from	Current Status
AR alumina	Bauxite	Dec'2018	Utilizing as per availability
Red mud	Laterite & Bauxite	Feb'2021	Utilizing as per availability

AR Alumina

RED MUD



Constituent	UOM	Carbon - SPL	Refractory SPL	Flue Gas
LOI	%	22.4	5.4	27.8
SiO <sub>2</sub>	%	18.9	29.5	6.8
Al <sub>2</sub> O <sub>3</sub>	%	26.8	44.6	33.9
Fe <sub>2</sub> O <sub>3</sub>	%	6.3	1.0	0.07
CaO	%	1.5	1.60	3.2
MgO	%	0.09	0.27	0.13
SO <sub>3</sub>	%	0.38	0.28	0.26
K <sub>2</sub> O	%	0.21	0.65	0.18
Na <sub>2</sub> O	%	21.1	14.40	24.8
TiO <sub>2</sub>	%	0.22	0.87	0.02
Mn <sub>2</sub> O <sub>3</sub>	%	0.04	0.01	<0.01
P <sub>2</sub> O <sub>5</sub>	%	0.04	0.05	0.02
F	%	1.09	0.9	1.6
Cl	%	0.05	0.03	0.02
Cd	ppm	NA	NA	NA
Tl	ppm	9	NA	61
As	ppm	22	31	43
Ni	ppm	661	1183	5430
Co	ppm	NA	NA	NA
Se	ppm	NA	NA	NA
In	ppm	NA	NA	NA
Cu	ppm	NA	23	NA
Pb	ppm	50	70	16
Tl	ppm	NA	NA	NA
Ba	ppm	NA	NA	NA
Mn	ppm	NA	NA	NA
Sr	ppm	NA	NA	NA
Cr	ppm	95	132	24
Zn	ppm	NA	NA	NA

Carbon-SPL



Refractory-SPL



Flue Gas-SPL



Red mud we are using from Alumina Industries which is very helpful our process to maintain Alkali-Sulphur ratio to avoid jamming & Ring formation at Inlet

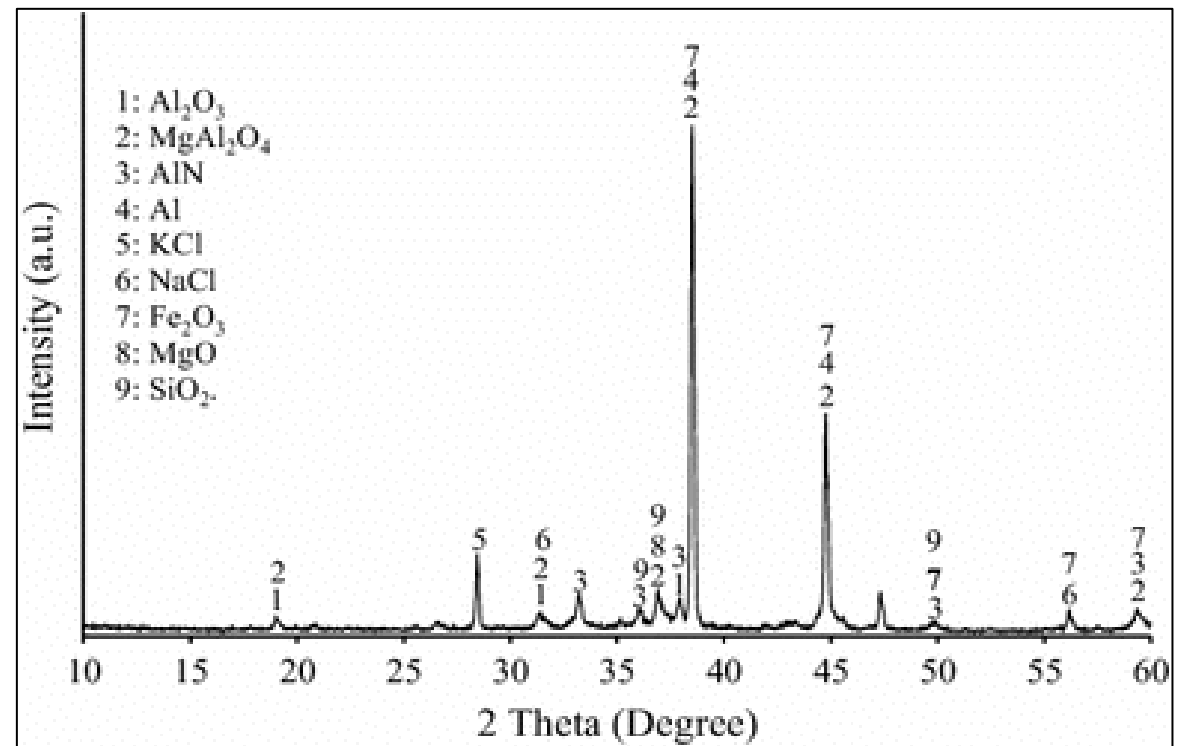
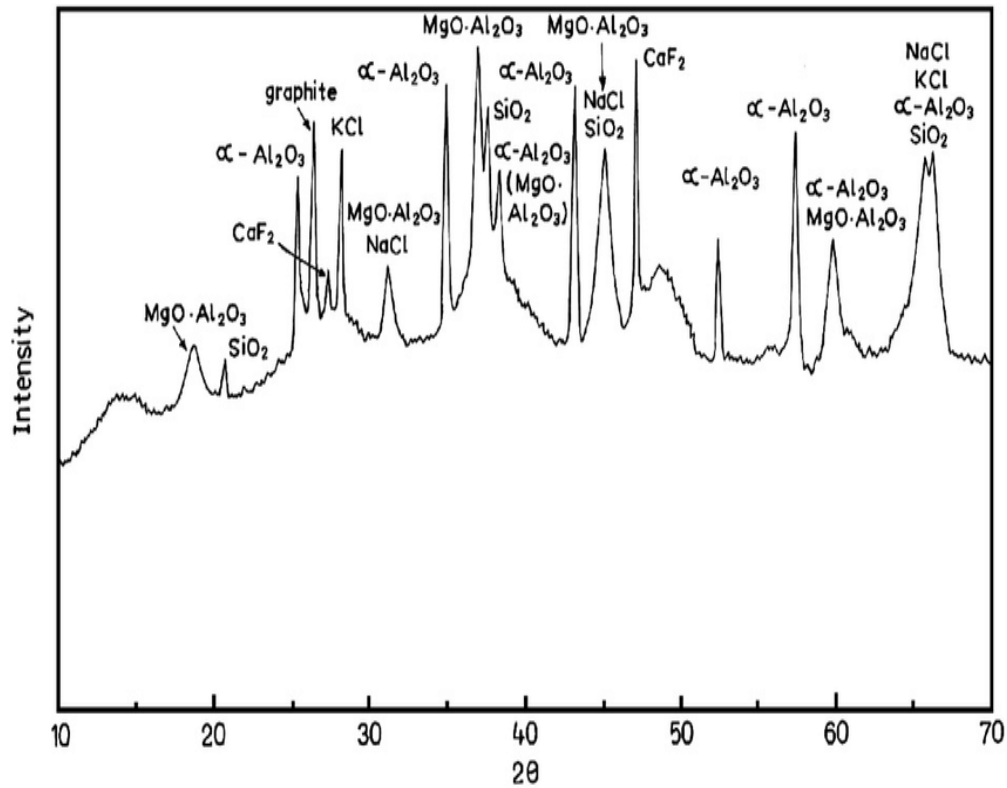
# 11.4 Flue Gas Dust and other particulates

Special (Carbon) Sample Analysis Report			
Parameters	Unit	J-120 Reject dust	Shot blast bag house dust
Ash	%	2.78	48.28
Volatile Matter	%	2.16	2.69
Inherent Moisture	%	0.042	0.292
GCV	( Kcal/Kg )	7638	3271
Fixed Carbon	%	95.02	48.74
S	%	2.79	0.82
V	ppm	204	119
Ni	ppm	108	507
Ni+V	ppm	312	626
Fe	ppm	4041	6210
Si	ppm	< 10	< 10
Na	ppm	713	22992
Ca	ppm	113	5165
P	ppm	8	68
Pb	ppm	6	7
Ti	ppm	9	10
Cr	ppm	7	6

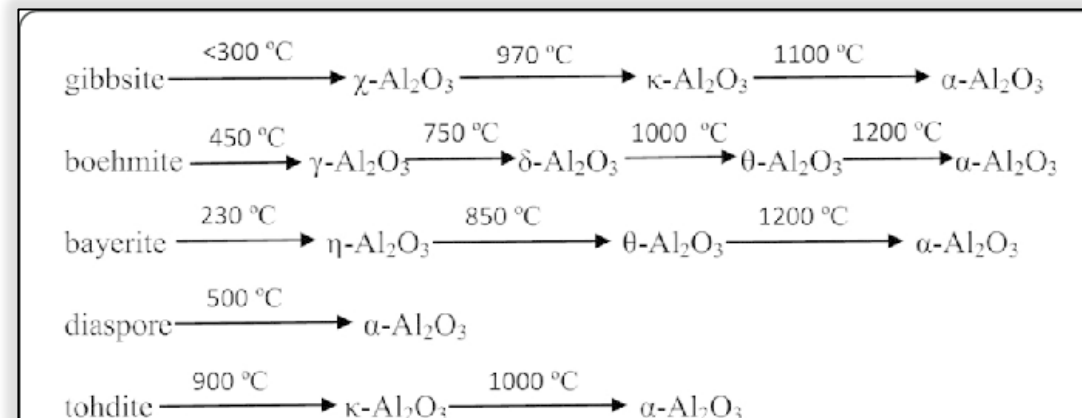
Generation (Tentative)	MT/Year	400	600
------------------------	---------	-----	-----

Carbon bath mix (shot blast) Analysis Report		
Parameters	Unit	Carbon bath mix (shot blast)
Ash	%	71.7
Volatile Matter	%	1.78
Inherent Moisture	%	0.03
GCV	( Kcal/Kg )	NA
Fixed Carbon	%	26.47
SiO2	ppm	550
Fe2O3	ppm	50890
V2O5	ppm	110
TiO2	ppm	40
P2O5	ppm	80
MgF2	ppm	4540

Generation (Tentative)	MT/Year	1200
------------------------	---------	------



Reference : research gate publication on Aluminium dross



- **Challenges of feeding hazardous SPL (hard to grind, Cyanide content, handling & storage issue). It should be clean of any impurities and only carbon part can be utilised in small proportion.**
- **Cut 2 material (alumina and refractory waste can be utilised to a small extent subject to trial)**
- **Carbon dust of rodding shop can be utilised with optimisation of sodium content and AlF<sub>3</sub> content to be checked.**
- **Cast House dross has aluminium, alumina and fluoride content, can be tried as mineraliser.**
- **Cement industry infra structure development for usage of SPL is prime concern.**
- **Cement companies should be compensated for trial.**
- **PCB should give permission for trial in shorter procedure. For trial also complete process of approval has to be followed. (11.2 & 11.4 approvals)**

ऊर्जा बचाने का करो संकल्प, पृथ्वी को बचाने का यही है विकल्प।



**Our Journey Continues.....**

**UltraTech Cement Ltd.**

**Vikram Cement Works**