Anglo Pacific minerals

Nepheline Syenite

Ceramic Grade

AP Cer is our ceramic-grade nepheline syenite product, which are naturally occurring, quartz-free, alkaline alumina silicate.

In ceramic application, nepheline syenite primarily serves as an excellent fluxing agent and has the following functions:

- significantly lowers melting point, and speeds up firing process
- increases body vitrification over a wide range of firing temperature
- improves absorption and moisture expansion
- improves mechanical strength
- increases thermal expansion and reduces variations of thermal expansion during production

Function / Category	Sanitary Ware	Ceramic Tiles	Electrocerami	Semi-vitrified	Low-temp
As fluxing agent to lower firing temp.	✓	✓			
Reduces fuel cost /Speeds up firing	✓				✓
Wide range of firing temp. avoids deformation	✓		✓	✓	✓
Improves absorption / Reduces moisture		✓	✓		
Improve mechanical strength		✓	✓		✓
Higher expansion coefficient enhances crack				✓	
Low tint strength maximizes colour strength					✓

Chemical Analysis	APCer 10	APCer 13
SiO_2	61.50% ± 2.00%	61.50% ± 2.00%
Al_2O_3	21.50% ± 1.00%	21.50% ± 1.00%
Fe_2O_3	0.10% ± 0.02%	0.13% ± 0.02%
TiO_2	0.05% ± 0.02%	0.05% ± 0.02%
Na_2O	8.50% ± 1.00%	8.50% ± 1.00%
K_2O	6.00% ± 1.00%	6.00% ± 1.00%
CaO	0.60% ± 0.30%	0.60% ± 0.30%
MgO	0.10% ± 0.05%	0.10% ± 0.05%
L.O.I	2.00% ± 0.50%	2.00% ± 0.50%

Particle Size Distribution	APCer 10	APCer 13
+ 75 µm (200 Mesh)	< 5.00%	-
+ 45 µm (325 Mesh)	-	< 5.00%
D_{50}	~ 18.0µm	~ 15.0µm

Other Physical Properties	APCer 10	APCer 13
Fused Whiteness	~ 46	~ 37
Moisture	< 0.3%	< 0.3%
Melting Point	~1,200°C	~1,200°C

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Nepheline Syenite

Filler Grade

In filler applications, nepheline syenite primarily serves as a performance enhancer and has the following functions/advantages:

- improves weatherability
- improves abrasion, scrub, stain, mildew and chalking resistance
- high brightness (> 92)
- great UV protection to resin and pigment system, and high yellowing resistance
- low tint strength even at high loading that maximizes the color strength
- optimal refractive index allows for high loading in transparent and translucent coatings and stains
- good dispersibility and low oil absorption in both water and solvent systems, and low viscosity even in high filler/pigment loading
- stable pH and chemical inertness
- low vehicle demand and exceptional resistance to frosting

Chemical Analysis

SiO_2	~ 61.50%
Al_2O_3	~ 20.80%
Fe_2O_3	< 0.15%
TiO_2	~ 0.03%
Na_2O	~ 8.40%
K_2O	~ 6.10%
CaO	~ 0.75%
MgO	~ 0.10%

These oxides primarily exist in nepheline and alkaline feldspar, and there is no free crystalline silica present in APNS.

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Nepheline Syenite

Filler Grade

Typical Properties	APNS 3	APNS 4	APNS 5	APNS 7	APNS10	APNS 12
106µm	100%	100%	100%	100%	100%	100%
75µm	99.9%	100%	100%	100%	100%	100%
45µm	98%	99.9%	100%	100%	100%	100%
30µm	90%	98.5%	99.5%	99.5%	99.8%	100%
20µm	75%	90%	90%	99%	99.5%	100%
15µm	65%	82%	75%	95%	98%	100%
10µm	50%	63%	65%	85%	97%	99.9%
5µm	25%	35%	30%	50%	80%	90%
2µm			10%			48%
D50 (µm)	10.0	7.0	8.0	4.5	2.5	2.1
Bulk Density	0.86	0.83	0.78	0.63	0.56	0.50
Oil Absorption (g/100g)	~21	~22	~24	~27	~31	~32.5
Whiteness	81	82.5	83	84.5	86	88.5
CIELAB Color L:	93.0	94.0	94.5	95.5	96.0	96.5
CIELAB Color a:	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
CIELAB Color b:	4.80	4.70	4.60	4.20	4.10	3.85
Hardness (mohs)	6.0	6.0	6.0	6.0	6.0	6.0
pH	8.9	8.9	8.9	9.1	9.2	9.3
Moisture	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%

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Nepheline Syenite

Glass Grade

APGlas is glass-grade nepheline syenite, which is a naturally occurring, quartz-free, alkaline alumina silicate.

In glass application, nepheline syenite primarily serves as an excellent fluxing agent and has the following advantages:

- Higher alumina content which improves matrix formation, stabilisation and physical resistance
- Higher alkali volume and improves fluxing, which lowers the melting temperature of the batch and reduces the quantity of high cost soda ash to be added
- Higher alkali/alumina ratio and lower fusion, which increase savings in raw materials handling, storages and energy used in production
- No free silica

Chemical Analysis	APGlas 13	APGlas 20
SiO_2	~ 60.0%	~ 60.0%
Al_2O_3	~ 22.0%	~ 22.0%
Fe_2O_3	0.13% (± 0.02%)	0.20% (± 0.02%)
TiO_2	~ 0.04%	~ 0.04%
Na_2O	~ 9.50%	~ 9.50%
K_2O	~ 6.00%	~ 6.00%
CaO	~ 0.55%	~ 0.55%
MgO	~ 0.10%	~ 0.10%
L.O.I	~ 1.80%	~ 1.80%

Particle Size Distribution	FinGlas 13	FinGlas 20
+ 850 µm (20 Mesh)	Trace	≤ 0.5%
+ 600 µm (30 Mesh)	≤ 3.0%	≤ 15.0%
- 106 µm (140 Mesh)	≤ 10.0%	≤ 5.0%
AFS	~ 55–70	~ 45–60
Moisture	≤ 0.3%	≤ 1.0%

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