



3989 Highway 290 East
Dripping Springs, Texas 78620
512-858-2993

Client: FX Minerals
Attn: John Koprevich

Report No: 31473
Date: 2/26/2020

Report of: Gradation Analysis, LA Abrasion, Moisture Content, Sand Equivalent, Magnesium Sulfate Soundness, Polish Stone Value, Bulk Specific Gravity & Absorption, Fine Aggregate Angularity, Acid Insoluble Residue & Micro-Deval Abrasion

Test Method: CT 202 (ASTM C136/ AASHTO T 27), CT 211 (ASTM C131/ AASHTO T 96), CT 226 (ASTM C556/ AASHTO T 255), CT 217 (ASTM D2419), ASTM C88, AASHTO T 279 (ASTM D3319), AASHTO T 84, AASHTO T 304, ASTM D3042 & ASTM D7428

Sample ID: Lot # - 20-0614D

Lab No: 200254

Sampled By: Client

Production/ Sampled Date: NP

Sample Location: NP

Project No: NP

Producer: FX Minerals

Received Date: 1/27/2020

Material Description: Alpha Stone ® HFST Calcined Bauxite

Test Performed By: Phillip New, CET

Results:

Test	Test Method	Result
Gradation Analysis	CT 202 (ASTM C136/ AASHTO T 27)	% Passing
Sieve Size		
#4		100.0
#6		99.4
#16		0.3
#30		0.0
#100		0.0
LA Abrasion (D Grading)	CT 211 (ASTM C131/ AASHTO T 96)	
- @ 100 Revolutions, %:		2
- @ 500 Revolutions, %:		10
Moisture Content, %:	CT 226 (ASTM C556/ AASHTO T 255)	0.02
Sand Equivalent:	CT 217 (ASTM D2419)	100
Magnesium Sulfate Soundness, %:	ASTM C88	1
British Pendulum No.	AASHTO T 279 (ASTM D3319)	Main Scale
Polish Value (Before Polishing):		56
Polish Value (After 10 Hrs Polishing):		40
Bulk Specific Gravity:	AASHTO T 84	3.349
Absorption, %:		0.8
Fine Aggregate Angularity- Method A (Standard Graded), %:	AASHTO T 304	47.8
Acid Insoluble Residue, %:	ASTM D3042	99
Micro-Deval Abrasion, %:	ASTM D7428	7



Report Reviewed by:

Dale A. Rand

PaveTex Engineering LLC
Firm Registration No. F-961

The results shown on this report are for the exclusive use of the client for whom they were obtained and apply only to the samples tested and/or inspected. They are not planned to be indicative of apparently identical products.

BOWSER-MORNER, INC.

Delivery Address: 4518 Taylorsville Road • Dayton, Ohio 45424 Mailing Address: P. O. Box 51 • Dayton, Ohio 45401

AASHTO/ISO 17025 Accredited • USACE Validated



LABORATORY REPORT

Report To: FX Minerals, Inc.
Attn: John Karson
257 Kennedy Park Marina Road
Newell, WV 26050

Report Date: March 11, 2020
Job No.: 194257
Report No.: 603829A
No. of Pages: 2

Report On: Laboratory Analysis of One Calcined Bauxite Sample
Sample ID: Alpha Stone HFST Calcined Bauxite – Lot No. 20-0614D

On February 3, 2020, one sample of calcined bauxite was submitted for selected laboratory analysis from the above referenced source. Testing was performed as specified by the client and in accordance with the following procedures.

AASHTO T 103, "Soundness of Aggregates by Freezing and Thawing – Method A".

ASTM C 117, "Materials finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing".

ASTM C 136, "Sieve Analysis of Fine and Coarse Aggregates".

Results are detailed on the attached data sheet.

Should you have any questions, or if we may be of further service, please contact me at (937) 236-8805, extension 235.

Respectfully submitted,

BOWSER-MORNER, INC.

A handwritten signature in blue ink, appearing to read "Karl A. Fletcher", written in a cursive style.

KAF/bwt
603829
1-File
1-jkoprevich@fxminerals.com

Karl A. Fletcher, Vice President
Assistant Director, CMT &
Geotechnical Laboratories

Sample ID: Alpha Stone HFST Calcined Bauxite – Lot No. 20-0614D

TABLE I
Sieve Analysis and Decantation (AASHTO T 27, T 11)

Sieve Size	Results
3/8"	100
No. 4	100
No. 8	62
No. 16	1
No. 30	0
No. 50	0
No. 100	0
No. 200	0.0
No. 200 Decant, %:	0.0

TABLE III
50 Cycle Freeze Thaw (AASHTO T 103)

Size Fraction	Percent Loss	Gradation Factor	Weighted Percent Loss
No. 4 to No. 8	2.40	0.378	0.91
No. 8 to No. 16	0.00	0.613	0.00
Totals	---	---	0.9

DATE: 27 SEP.,2019

[illegible]



FX MINERALS, INC.

257 Kennedy Park Marina Road

Newell, WV 26050

Tel: 304 387-1160

Fax: 304 387-2205

Alpha Stone®

HFST

High Friction Surface Treatment

PRODUCT DATA

Property	Specification	Typical
Al ₂ O ₃	87.00% min.	87.7%
Moisture	0.20% max.	<0.07%
Specific Gravity As 3x6 mesh	3.25 g/cc min.	3.27 g/cc
LA Abrasion	<20%	2% @ 100 rev. 5% @ 500 rev.
Sand equivalent		100
Mg Soundness		1-3
Polish Stone Value AASHTO T279/ASTM D3319	38	71 before polishing 62 after 10 hrs.
Moh's Hardness		9
Acid Insolubility		98.8%-99.1%
Size Distribution		
Screen	Specification	Typical
4 mesh	100% passing	100% passing
6 mesh	95-100% passing	98% passing
16 mesh	0-5% passing	1.8% passing

Information on this data sheet for general use only and specific situations may apply to all products.

This sheet is property of FX Minerals, Inc. and shall not be used, copied or released without permission from FX Minerals, Inc.



Chinese Bauxite

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date: 01/15/2017

Supersedes: 08/25/2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name : Chinese Bauxite
Other means of identification : Calcined Bauxite, ALPHA STONE™, HFST Bauxite, RK Bauxite, Rotary Kiln Bauxite

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Refractory products, Highway Aggregate

1.3. Details of the supplier of the safety data sheet

FX Minerals Processing
257 Kennedy Park Marina Road
Newell, WV 26050
(304) 387-1160

1.4. Emergency telephone number

Emergency number : (304) 387-1160
After 5PM weekdays, weekends and holidays: (412) 956-7578

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) Not Classified

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :

NOT APPLICABLE

Signal word (GHS-US) : No Signal Word

Hazard statements (GHS-US) : Not Applicable

Precautionary statements (GHS-US) :

NOT APPLICABLE

2.3. Other hazards

Other hazards not contributing to the classification : Other constituents in this product are considered nuisance particles or dust. Exposure to dusts or powders may cause mechanical irritation of the respiratory system, eyes, and skin.

2.4. Unknown acute toxicity (GHS-US)

99.3 percent of the mixture consists of ingredient(s) of unknown acute toxicity (Inhalation (Dust/Mist))

Chinese Bauxite

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS-US classification
Aluminum Oxide	(CAS No) 1344-28-1	>80%	STOT Rep. Exp.1
Titanium Dioxide	(CAS No) 13463-67-7	<4.0	Not classified

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- First-aid measures after inhalation : If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.
- First-aid measures after skin contact : Use good hygiene practices including washing of skin with soap and water. If irritation occurs, seek medical attention.
- First-aid measures after eye contact : In case of eye contact, flush eyes with water. If necessary, seek medical attention.
- First-aid measures after ingestion : Not an anticipated route of exposure. If a large amount is swallowed, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : There are potential chronic health effects to consider.
- Symptoms/injuries after inhalation : May cause respiratory irritation
- Symptoms/injuries after skin contact : No known significant effects or critical hazards
- Symptoms/injuries after eye contact : May cause eye irritation
- Symptoms/injuries after ingestion : No known significant effects or critical hazards

4.3 Over – Exposure Signs/Symptoms

- Signs/Symptoms eye contact : May cause eye irritation. No chronic effect known
- Signs/Symptoms inhalation : Long term exposure to high airborne concentrations may result in inflammation of the small airways and asthma-like symptoms
- Signs/Symptoms skin contact : No known significant effects or critical hazards
- Signs/Symptoms ingestion : No known significant effects or critical hazards

4.4. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Seek medical care if large quantities have been ingested or inhaled.

Chinese Bauxite

Safety Data Sheet

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Any. Use media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : No specific fire or exposed hazard

Reactivity : Not reactive under normal use and conditions.

5.3. Advice for firefighters

Protection during firefighting : Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection.

Chinese Bauxite

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Products are naturally occurring earthen materials. No special precautions are known.

6.1.1. For non-emergency personnel

Emergency procedures : Products are naturally occurring earthen materials. No special precautions are known

6.1.2. For emergency responders

Protective equipment : Products are naturally occurring earthen materials. No special precautions are known

Emergency procedures : Products are naturally occurring earthen materials. No special precautions are known

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Do not touch or walk through spilled material.

Methods for cleaning up : Completely remove dusts to prevent recirculation of nuisance dust. For small spills, clean with a vacuum with a filtration system sufficient to remove and prevent dust recirculation. For large spills, use a fine spray or mist to control dust creation and carefully scoop or shovel into clean, dry container for later reuse or disposal. DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear personal protective equipment in accordance with those recommendations provided in Section 8. Use good hygiene practices and wash hands and face before eating, drinking or conducting personal hygiene. Reduce contamination from clothing and protective equipment before entering eating areas.

Hygiene measures : Practice good housekeeping. Wash thoroughly after handling. Change contaminated clothing. Do not reuse until laundered.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Containers should be stored in room at ambient temperature and pressure. Keep container closed when not in use.

7.3. Specific end use(s)

Use of the substance/mixture : Refractory products, Highway aggregate

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Calcined Bauxite (1318-16-7)		
ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³
OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (Total dust); 5 mg/m ³ (Respirable Fraction)
Aluminum Oxide (1344-28-1)		
ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³
OSHA	OSHA PEL (TWA) (mg/m ³)	>= 15 mg/m ³ /Total
OSHA	OSHA PEL (TWA) (mg/m ³)	>= 5 mg/m ³ /Resp.
Titanium Dioxide (13463-67-7)		

Chinese Bauxite

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³
OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³

8.2. Exposure controls

Ingredient comments: Occupational exposure to respirable dust should be monitored and controlled. The product should be handled using methods and techniques that minimize or eliminate dust generation. The product contains less than 1% w/w RCS (respirable crystalline silica) as determined by XRD Methods (NIOSH 7500).

Hand protection	: None required. Polymeric gloves are recommended to prevent irritation. Nitrile construction materials appear to offer the best protection against the ingredients of the product.
Eye protection	: Chemical goggles or safety glasses.
Skin and body protection	: Under dusty conditions or when excessive skin contact is likely, wear coveralls or other suitable work clothing.
Respiratory protection	: Wear NIOSH/MSHA approved respirator equipped with particulate cartridges when dusty in poorly ventilated areas, and if exposure limits are exceeded. A respiratory program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
Personal protective equipment	: Avoid all unnecessary exposure.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Powder.
Color	: Grayish in Color
Odor	: No data available
Odor threshold	: No data available
pH	: 6.5 - 8
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: 1648 °C (3000 °F)
Freezing point	: Not applicable
Boiling point	: Not applicable
Flash point	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: 0.9 - 2 (water = 1)
Solubility	: Insoluble Water: Solubility in water of component(s) of the mixture:
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: Not applicable

Chinese Bauxite

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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 10: Stability and reactivity

10.1. Reactivity

Not reactive under normal use and conditions.

10.2. Chemical stability

Stable at normal temperatures and pressure.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

Avoid generating dust.

10.5. Incompatible materials

Strong acids. Strong oxidizing agents.

10.6. Hazardous decomposition products

Combustion may produce carbon monoxide and other harmful substances

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Acute toxicity (Oral LD50) Not relevant

Acute Toxicity (Dermal LD50) Not relevant

Acute Toxicity (Inhalation) Not Relevant

This substance has no evidence of carcinogenic properties

Inhalation: May cause irritation in respiratory system from highly concentrated dust

Ingestion: May cause discomfort if swallowed

Skin Contact: May cause discomfort on skin

Eye Contact: Particles in eyes may cause irritation

SECTION 12: Ecological information

12.1. Toxicity

Not expected to be toxic to aquatic organisms.

12.2. Persistence and degradability

No additional information available

12.3. Bio accumulative potential

Bio accumulative potential

This product is not expected to bio accumulate.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming : No known ecological damage caused by this product.

Chinese Bauxite

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of as inert solid in landfill. Dispose of waste material according to Local, State and Federal environmental regulations. Never discharge directly into sewers or surface waters. Slurry may plug drains.

SECTION 14: Transport information

In accordance with
DOT not regulated
for transport

Additional information

Other information : No supplementary information available.

ADR

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Chinese Bauxite

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

Calcined Bauxite (1318-16-7)

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

Titanium Dioxide (13463-67-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

No additional information available

EU-Regulations

(EC) No. 453/2010

Classification according to Regulation (EC) No. 1272/2008 [CLP]

H372 - Causes damage to lungs through prolonged or repeated exposure via inhalation

15.2.2. National regulations

No additional information available

Chinese Bauxite

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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

15.3. US State regulations

Titanium Dioxide (13463-67-7)

U.S. - New Jersey - Right to Know Hazardous Substance List

Aluminum Oxide (CAS 1344-28-1)

Titanium Dioxide (CAS 13463-67-7)

U.S. - Massachusetts - Right to Know List

Aluminum Oxide (CAS 1344-28-1)

Titanium Dioxide (CAS 13463-67-7)

U.S. - Pennsylvania - Right to Know List

Aluminum Oxide (CAS 1344-28-1)

Titanium Dioxide (CAS 13463-67-7)

SECTION 16: Other information

Revision date

08/25/2015

Data sources

: ChemADVISOR, Inc.[<https://www.chemadvisor.com>]. GESTIS DNEL Database [[http://dnel-en.itrust.de/nxt/gateway.dll/dnel_en/000000.xml?f=templates\\$fn=default.htm\\$vid=dneleng:ddbeng\\$3.0/](http://dnel-en.itrust.de/nxt/gateway.dll/dnel_en/000000.xml?f=templates$fn=default.htm$vid=dneleng:ddbeng$3.0/)].

Full text of H-phrases:

STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
H372	Causes damage to organs through prolonged or repeated exposure

NFPA health hazard

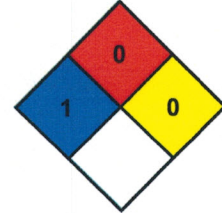
: 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health

: 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability

: 0 Minimal Hazard

Physical

: 0 Minimal Hazard

Personal Protection

: E

SDS US (GHS HazCom 2012)

CALIFORNIA Prop 65 Components: This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm

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