Kyanite
Safety Data Sheet

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

1.1. Product identifier

Product name : Kyanite
Product ID : K35
K48
K100
K200
K325

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Mining Product

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Kyanite Mining Corporation
30 Willis Mountain Plant Lane
Dilwyn, VA 23936
T 434-983-4322

1.4. Emergency telephone number

434-983-2085 (US)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Not classified

Adverse physicochemical, human health and environmental effects

No additional information available

Per XRC(M) analysis, any naturally occurring Respirable Crystalline Silica (RCS) that may exist in this product is inextricably bound, environmentally unavailable and at de minimis concentration. Thus, in its current and anticipated future physical state, the product is incapable of causing toxicologically relevant RCS exposure under either normal conditions of use or in case of extreme upset.

2.2. Label elements

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

No labelling applicable

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Kyanite (Al2O(SiO4))	(CAS-No.) 1302-76-7 (EC-No.) 215-106-4	85 – 95	Not classified
Quartz	(CAS-No.) 14808-60-7 (EC-No.) 238-878-4	5 – 10	Carc. 1A, H350 STOT RE 1, H372
Rutile (TiO2)	(CAS-No.) 1317-80-2 (EC-No.) 215-282-2	1 – 5	Not classified

Comment on mixture: Content of respirable crystalline silica dust (10µm and below) is below CLP threshold limits and X-Ray Diffraction (XRD) detection limit of 0.1%.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Immediate effects are not expected. If high concentrations of dust are inhaled, remove to fresh air. If breathing problems occur, a certified professional should administer oxygen or artificial respiration as indicated and obtain immediate medical attention.

First-aid measures after skin contact : None required.

First-aid measures after eye contact : Dusts and particles may case physical abrasion. Do not rub eyes. Rinse eyes with lukewarm water for at least 15 minutes. Open and close the eyelids during rinsing to remove all dusts and particles. If irritation persists, seek medical attention.

First-aid measures after ingestion : None required for small amounts. If substantial quantities are ingested, give 4-8 ounces of water or milk to dilute and seek medical advice.

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

Symptoms/effects after inhalation : Inhalation of high dust concentrations may cause coughing and mild irritation. Repeated inhalation of dusts containing crystalline silica over time can cause progressive fibrotic lung disease (silicosis) and increase the risks of developing respiratory cancer. Lung damage may progress even if the worker is removed from exposure. Silicosis can result in death from cardiac failure or the destruction of lung tissue. The extent and severity of lung damage depends on a variety of factors including particle size, percentage of silica, natural resistance, dust concentration, and length of exposure. Aluminum silicates may also cause milder lung effects.

Symptoms/effects after skin contact : Irritation is not expected.

Symptoms/effects after eye contact : Chemical irritation is not expected. Dusts and particles may scratch the eyes.

Symptoms/effects after ingestion : Not considered a likely route of exposure under normal product use conditions. May cause gastrointestinal irritation if swallowed. Product is relatively non-toxic.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Does not burn. Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : None.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Not flammable.

Explosion hazard : None known.

5.3. Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid inhalation of dust from the spilled material. Do not walk through or scatter spilled material.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Stop the flow of material, if this is without risk.

Methods for cleaning up : Use wet clean-up methods (wiping, mopping, etc.) or a vacuum to remove small amounts. The vacuum must be equipped with a filtration system sufficient to remove and prevent the recirculation of crystalline silica (a vacuum equipped with a high-efficiency particulate air filter (HEPA) filter is recommended). For large spills, use a fine water spray or mist to control dust creation and carefully scoop or shovel into a clean, dry container for later reuse or disposal. Completely remove all dusts to prevent recirculation of crystalline silica into the workplace. DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS. Clean-up personnel must wear appropriate protective equipment including respiratory protection (See Section 8).

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Plant processes should be designed to control airborne dusts at or below acceptable exposure guidelines. DO NOT use compressed air or dry sweeping to remove dust from work area. Dusts should be removed using vacuum or wet clean-up methods (wet towels, use of mists, etc.).

Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal and respiratory protection should be the last article of clothing removed. DO NOT REMOVE dusts from clothing by blowing or shaking. Practice good housekeeping. Wash thoroughly after handling. Launder contaminated clothing before re-wearing. Do not take contaminated clothing home.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry area in closed containers. Storage and work areas should be periodically cleaned to minimize dust accumulation.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Kyanite (Al2O(SiO4)) (1302-76-7)	
Latvia - Occupational Exposure Limits	
OEL TWA (mg/m³)	2 mg/m³

Quartz (14808-60-7)	
Austria - Occupational Exposure Limits	
MAK (mg/m³)	0.15 mg/m³ (yearly average, valid till 12/31/2013, the assessment period is one year-alveolar dust, respirable fraction)
Belgium - Occupational Exposure Limits	
Limit value (mg/m³)	0.1 mg/m³ (alveolar dust)
Bulgaria - Occupational Exposure Limits	
OEL TWA (mg/m³)	0.07 mg/m³ (respirable fraction)
Croatia - Occupational Exposure Limits	
GVI (granična vrijednost izloženosti) (mg/m³)	0.1 mg/m³ 0.1 mg/m³ (regulated under Quartz sand-respirable dust)
Czech Republic - Occupational Exposure Limits	
Expoziční limity (PEL) (mg/m³)	0.1 mg/m³ (dust)
Denmark - Occupational Exposure Limits	
Grænseværdie (langvarig) (mg/m³)	0.3 mg/m³ (total) 0.1 mg/m³ (respirable)
Estonia - Occupational Exposure Limits	
OEL TWA (mg/m³)	0.1 mg/m³ (respirable dust)
Finland - Occupational Exposure Limits	
HTP-arvo (8h) (mg/m³)	0.05 mg/m³ (respirable dust)
France - Occupational Exposure Limits	
VME (mg/m³)	0.1 mg/m³ (restrictive limit-alveolar fraction)
Hungary - Occupational Exposure Limits	
AK-érték	0.15 mg/m³ (respirable)
Ireland - Occupational Exposure Limits	
OEL (8 hours ref) (mg/m³)	0.1 mg/m³ (respirable dust)
Lithuania - Occupational Exposure Limits	
IPRV (mg/m³)	0.1 mg/m³ (Silicon dioxide variation-respirable fraction)
Netherlands - Occupational Exposure Limits	
Grenswaarde TGG 8H (mg/m³)	0.075 mg/m³ (respirable dust)
Poland - Occupational Exposure Limits	
NDS (mg/m³)	2 mg/m³ (>50% free crystalline silica-inhalable fraction) 0.3 mg/m³ (>50% free crystalline silica-respirable fraction) 4 mg/m³ (2% to 50% free crystalline silica-inhalable fraction) 1 mg/m³ (2% to 50% free crystalline silica-respirable fraction)
Portugal - Occupational Exposure Limits	
OEL TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
OEL chemical category (PT)	A2 - Suspected Human Carcinogen
Romania - Occupational Exposure Limits	
OEL TWA (mg/m³)	0.1 mg/m³ (dust, respirable fraction)
Slovakia - Occupational Exposure Limits	
NPHV (priemerná) (mg/m³)	0.1 mg/m³ (in Cristobalite or Tridymite-total aerosol)
Slovenia - Occupational Exposure Limits	
OEL TWA (mg/m³)	0.15 mg/m³ (respirable fraction)

Quartz (14808-60-7)	
Spain - Occupational Exposure Limits	
VLA-ED (mg/m³)	0.05 mg/m³ (reclassified IARC group 2A to group 1-respirable fraction)
Sweden - Occupational Exposure Limits	
nivågränsvärde (NVG) (mg/m³)	0.1 mg/m³ (respirable dust)
OEL chemical category (SE)	Carcinogen
Norway - Occupational Exposure Limits	
Grenseverdier (AN) (mg/m³)	0.3 mg/m³ (dust containing .alpha.-Quartz, Cristobalite and/or Tridymite is evaluated by summation formula-total dust) 0.1 mg/m³ (dust containing .alpha.-Quartz, Cristobalite and/or Tridymite is evaluated by summation formula-respirable dust)
Grenseverdier (Korttidsverdi) (mg/m3)	0.9 mg/m³ (dust containing .alpha.-Quartz, Cristobalite and/or Tridymite is evaluated by summation formula-total dust) 0.3 mg/m³ (dust containing .alpha.-Quartz, Cristobalite and/or Tridymite is evaluated by summation formula-respirable dust)
OEL chemical category (NO)	Carcinogen
Switzerland - Occupational Exposure Limits	
MAK (mg/m³)	0.15 mg/m³ (respirable dust)
OEL chemical category (CH)	Category C1A carcinogen
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
ACGIH chemical category	Suspected Human Carcinogen

8.2. Exposure controls

Appropriate engineering controls:
Use local exhaust and general ventilation as necessary to control air contaminants at or below acceptable exposure guidelines. Collection systems must be designed and maintained to prevent the accumulation and recirculation of respirable silica into the workplace. Additional controls to limit exposure to crystalline silica may include but are not limited to: wet processes, installation of dust collection systems, dust control additives, enclosed work processes, and automated processes.

Hand protection:
Protective gloves are recommended.

Eye protection:
Safety glasses with side shields or goggles to prevent dust and particles from entering the eyes.

Skin and body protection:
Use body protection appropriate for task.

Respiratory protection:
If exposure limits are exceeded or irritation is experienced, NIOSH approved respiratory protection should be worn.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Appearance	:	Vitreous
Colour	:	Pearly-gray
Odour	:	Odourless

Odour threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	P.C.E. 36-37
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	3.2-3.7
Solubility	:	No data available
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Will not occur.

10.4. Conditions to avoid

None.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Quartz may convert to cristobalite at high temperature (> 1470 ºC). Kyanite will decompose to form mullite and cristobalite at high temperatures (~ 1450 ºC). This conversion is associated with a large irreversible volume change.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified
Serious eye damage/irritation	:	Not classified
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified

Carcinogenicity : In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However it pointed out that not all industrial circumstances, nor all crystalline silica types, were to be incriminated. (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust and organic fibres, 1997, Vol. 68, IARC, Lyon, France.)

In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore preventing the onset of silicosis will also reduce the cancer risk (SCOEL SUM Doc 94-final, June 2003).

So there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from silicosis. Worker protection against silicosis should be assured by respecting the existing regulatory occupational exposure limits and implementing additional risk management measures where required

Quartz (14808-60-7)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity : Not classified

STOT-single exposure : The short-term or immediate effects of dust inhalation are expected to be coughing and mild respiratory irritation. Scratching or physical damage to the eyes can cause irritation, pain, redness, tears, blurred vision, and light sensitivity. There may be no symptoms during the early stages of chronic silicosis. As the disease progresses, the symptoms include tiredness, shortness of breath, severe cough, and characteristic x-rays. Shortness of breath upon exertion is one of the most common symptoms and limited chest expansion is the most common physical sign.

STOT-repeated exposure : May cause damage to lungs through prolonged or repeated exposure. Silicosis is a progressive fibrotic pneumoconiosis that greatly decreases the ability of the lungs to provide oxygen (decreased pulmonary capacity). Three types of silicosis have been identified. Acute silicosis can occur several weeks or months following exposure to very high levels of crystalline silica and can result in death in months or within several years. Accelerated silicosis can occur 5-10 years after exposure to higher levels of crystalline silica. Chronic silicosis is the most common type and usually occurs after 10 or more years of exposure to low levels of crystalline silica.

Similar aluminum silicate minerals such as kaolin have been found to cause lung fibrosis in the absence of crystalline silica. The disease is not as severe as silicosis but can cause respiratory symptoms and changes. Crystalline silica exposure appears to enhance the severity of the disease.

Animal studies indicate that cristobalite has a greater potential to produce fibrosis than quartz. Cristobalite produces a more severe response than quartz and fibrosis elicited is diffuse rather than nodular.

Other: Silica particles less than 10 m are considered respirable; however, particles retained in the lungs are generally much smaller. A median diameter of particles retained in the lungs has been cited as 0.5-0.7 µm.

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : Not applicable
UN-No. (IMDG) : Not applicable
UN-No. (IATA) : Not applicable
UN-No. (ADN) : Not applicable
UN-No. (RID) : Not applicable

14.2. UN proper shipping name

Proper Shipping Name (ADR) : Not applicable
Proper Shipping Name (IMDG) : Not applicable
Proper Shipping Name (IATA) : Not applicable
Proper Shipping Name (ADN) : Not applicable
Proper Shipping Name (RID) : Not applicable

14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR) : Not applicable

IMDG
Transport hazard class(es) (IMDG) : Not applicable

IATA
Transport hazard class(es) (IATA) : Not applicable

ADN
Transport hazard class(es) (ADN) : Not applicable

RID
Transport hazard class(es) (RID) : Not applicable

14.4. Packing group

Packing group (ADR) : Not applicable
Packing group (IMDG) : Not applicable
Packing group (IATA) : Not applicable

Packing group (ADN)	:	Not applicable
Packing group (RID)	:	Not applicable

14.5. Environmental hazards

Dangerous for the environment	:	No
Marine pollutant	:	No
Other information	:	No supplementary information available

14.6. Special precautions for user

Overland transport
No data available

Transport by sea
No data available

Air transport
No data available

Inland waterway transport
No data available

Rail transport
No data available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances
Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.
Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.2. National regulations

Germany

Water hazard class (WGK)	:	WGK 3, Highly hazardous to water (Classification according to AwSV, Annex 1)
Hazardous Incident Ordinance (12. BImSchV)	:	Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

SZW-lijst van kankerverwekkende stoffen	:	Quartz is listed
SZW-lijst van mutagene stoffen	:	None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding	:	None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid	:	None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling	:	None of the components are listed

Denmark

Danish National Regulations	:	Young people below the age of 18 years are not allowed to use the product Pregnant/breastfeeding women working with the product must not be in direct contact with the product The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Classification according to Regulation (EC) No. 1272/2008 [CLP]:	
Not classified	

Full text of H- and EUH-statements:	
Carc. 1A	Carcinogenicity, Category 1A
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.