

# Material Safety Data Sheet

## Lutetium Aluminum Oxide

WOOSUKAT Co.,LTD

### 1. Product and Company Identification

Product Name	:	Lutetium Aluminum Oxide
Chemical Formular	:	Lu <sub>3</sub> Al <sub>5</sub> O <sub>12</sub> :Ce
Identified Uses	:	Optical Material for Manufacture of Optical Components
Manufacturer/Supplier	:	WOOSUKAT CO.,LTD Kyunggido Hwasungsi Hyangnamup Udenggil20 ,Republic of Korea Tel No. +82-31-227-7146 Fax No. +82-31-227-7147
Emergency Contact	:	Tel No. +82-31-227-7146 (Domestic and International)
Emergency Action	:	In the event of a medaical enquiry involving this product, please contact doctor or local hospital accident and emergency department.

### 2. Hazards Identification

Classification of substance	:	None
Hazard Statement	:	Do not breath dust/frame/gas/mist/vapours/spray
HMIS Health ratings	:	Health 1
	:	Flammability 0
	:	Physical 0

### 3. Composition / Information on Ingredients

Chemical Family	:	Ceramic
Additional Name	:	Luttetium Aluminum Garnet, LuAG
Percaentage	:	99.5-99.99wt%
CAS No.	:	Lutetium Oxide : 12032-20-1 Aluminum Oxide : 1344-28-1 Cerium Oxide : 1345-13-7
EC No.	:	Lutetium Oxide : 234-764-3 Aluminum Oxide : 215-691-6 Cerium Oxide : 215-718-1
Wt %	:	Lutetium Oxide : 62.2 Aluminum Oxide : 37.2 Cerium Oxide : 0.6

### 4. First Aid Measures

General Treatment	:	Consult a doctor for specific advice.
Eyes	:	Irrigate throughly with water for enough times, If discomfort persists obtain medical attention.
Skin	:	Wash throughly with soap and water.
Inhalation	:	Remove victiom to fresh air. Supply oxygen if breathing is difficult.
Ingestion	:	Wash out mouth throughly with water. In severe cases obtain medical attention.

### 5. Fire Fighting Measures

Flammability	:	Non Flammable, except as powder.
Extinguishing Media	:	Don't use water for metal fires-use CO <sub>2</sub> , sand, extinguishing powder.
Fire Fighting Procedure	:	Use full-face, Self-contained breathing apparatus with full protective clothing to prevent conatct with skin and eyes.

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## 6. Accidental Release Measures

If material is released/spilled	: Wear appropriate respiratory and protective equipment specified in special protection information. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute(HEPA) air filter and place in a closed container for disposal. Take care not to raise dust.
Environmental Precautions	: Isolate runoff to prevent environmental pollution.

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## 7. Handling and Storage

Handling conditions	: Wash thoroughly after Handling.
Storage Conditions	: Store in a cool dry place in a tightly sealed container. Store apart from materials and conditions listed in section.
Work/Hygenic Maintenance	: Do not use tobacco or food in works area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.
Ventilation	: Provide sufficient ventilation to maintain concentration at or below

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## 8. Exposure Controls and Personal Protection

Permissible Exposure Limits	: 1 mg/m <sup>3</sup> as dust, long-term value
Threshold Limit Value	: 1 mg/m <sup>3</sup> as dust, long-term value
Special Equipment	: None
Respiratory Protection	: Dust respirator
Protective Gloves	: Rubber gloves
Eye Protection	: Safety glasses or goggles
Body protection	: Protective works clothing. Wear close-toed shoes and log sleeves/pants.

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## 9. Physical and Chemical Characteristics

Color	: Green
Form	: Lump, Powder
Odor	: None
Water Solubility	: Insoluble
Melting Point	: 1980°C
Flash Point	: Non Applicable
Flammability	: Non Applicable
Specific Gravity	: 6.71 g/mL
Vapour Pressure	: Negligible at 25°C

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## 10. Stability and Reactivity

Stability	: Stable under recommended storage condition
Hazardous Reactions	: None Known
Incompatible Conditions	: None

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## 11. Toxicological Information

Potential Health Effects	: May cause irritation on eye, skin, ingestion, Inhalation
Signs and Symptoms	: None Applicable
Median Lethal Dose	: None Applicable
Toxicological Effects	: Not known to have been fully investigated. No evidence of toxicity hazards are known. Particular care must be exercised when machining and creating dust or particles.

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## 12. Ecological Information

Aquatic Toxicity	: Low
Bio-accumulative Potential	: No Data

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<b>13. Disposal Consideration</b>	
Waste Treatment Methods	: Chemical residues are generally classified as special waste and covered by regulations which vary according to location. Contact your local waste disposal authority for advice, or pass to a chemical disposal company

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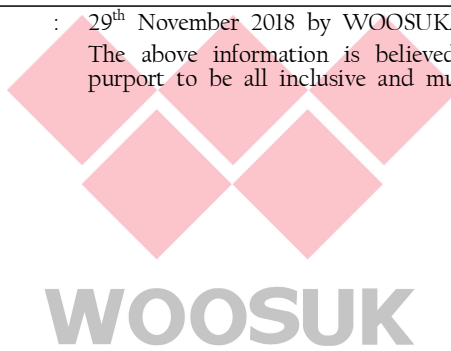
<b>14. Transport Information</b>	
Hazardous	: Not hazardous for transportation
Hazard Class	: Non Applicable
Packing Group	: Non Applicable
UN Number	: Non Applicable
Proper Shipping Name	: Non Applicable

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<b>15. Regulatory Information</b>	
Sec 302 Extremely Hazardous	: No
Sec 304 Reportable Quantities	: Non Applicable
Sec 313 Toxic Chemicals	: No

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<b>16. Other information</b>	
Revision Date	: 29 <sup>th</sup> November 2018 by WOOSUKAT Co.,LTD The above information is believed to be correct but does not purport to be all inclusive and must be used only as a guide.



# Material Safety Data Sheet

## Yttrium Aluminum Garnet

WOOSUK AT Co.,LTD

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### 1. Product and Company Identification

Product Name	:	Yttrium Aluminum Oxide
Chemical Formular	:	$Y_3Al_5O_{12};Ce$
Identified Uses	:	Optical Material for Manufacture of Optical Components
Manufacturer/Supplier	:	WOOSUK AT CO.,LTD Kyunggido Hwasungsi Bongdamup Saemaigil 21, Korea Tel No. +82-31-227-7146 Fax No. +82-31-227-7147
Emergency Contact	:	Tel No. +82-31-227-7146 (Domestic and International)
Emergency Action	:	In the event of a medaical enquiry involving this product, please contact doctor or local hospital accident and emergency department.

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### 2. Hazards Identification

Classification of substance	:	None
Hazard Statement	:	Do not breath dust/frame/gas/mist/vapours/spray
HMIS Health ratings	:	Health 1
		Flammability 0
		Physical 0

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### 3. Composition / Information on Ingredients

Chemical Family	:	Ceramic
Additional Name	:	Yttrium Aluminum Garnet, YAG
Percaentage	:	99.5-99.99wt%
CAS No.	:	12005-21-9
EC No.	:	234-465-8

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### 4. First Aid Measures

General Treatment	:	Consult a doctor for specific advice.
Eyes	:	Irrigate throughly with water for enough times, If discomfort persists obtain medical attention.
Skin	:	Wash throughly with soap and water.
Inhalation	:	Remove viction to fresh air. Supply oxygen if breathing is difficult.
Ingestion	:	Wash out mouth throughly with water. In severe cases obtain medical attention.

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### 5. Fire Fighting Measures

Flammability	:	Non Flammable, except as powder.
Extinguishing Media	:	Don't use water for metal fires-use CO <sub>2</sub> , sand, extinguishing powder.
Fire Fighting Procedure	:	Use full-face, Self-contained breathing apparatus with full protective clothing to prevent conatact with skin and eyes.

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### 6. Accidental Release Measures

If materal is released/spilled	:	Wear appropriate respiratory and protective equipment specified in special protection information. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolutr(HEPA) air filter and place in a closed container for disposal. Take care not to raise dust.
Environmental Precautions	:	Isolate runoff to prevent environmental pollution.

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## 7. Handling and Storage

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Handling conditions	:	Wash thoroughly after Handling.
Storage Conditions	:	Store in a cool dry place in a tightly sealed container. Store apart from materials and conditions listed in section.
Work/Hygenic Maintenance	:	Do not use tobacco or food in works area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.
Ventilation	:	Provide sufficient ventilation to maintain concentration at or below

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## 8. Exposure Controls and Personal Protection

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Permissible Exposure Limits	:	1 mg/m <sup>3</sup> as dust, long-term value
Threshold Limit Value	:	1 mg/m <sup>3</sup> as dust, long-term value
Special Equipmet	:	None
Respiratory Protection	:	Dust respirator
Protective Gloves	:	Rubber gloves
Eye Protection	:	Safety glaases or goggles
Body protection	:	Protective works clothing. Wear close-toed shoes and log sleeves/pants.

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## 9. Physical and Chemical Characteristics

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Color	:	Yellow
Form	:	Lump, Powder
Odor	:	None
Water Solubility	:	Insoluble
Melting Point	:	1940°C
Flash Point	:	Non Applicable
Flammability	:	Non Applicable
Specific Gravity	:	4.56 g/mL
Vapour Pressure	:	Neligible at 25°C

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## 10. Stability and Reactivity

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Stability	:	Stable under recommended storage condition
Hazardous Reactions	:	None Known
Incompatible Conditions	:	None

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## 11. Toxicological Information

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Potential Health Effects	:	May cause irritation on eye, skin, ingestion, Inhalation
Signs and Symptoms	:	None Applicable
Median Lethal Dose	:	None Applicable
Toxicological Effects	:	Not known to have been fully investigated. No evidence of toxicity hazards are known. Particular care must be excised when machining and creating dust or particles.

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## 12. Ecological Information

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Aquatic Toxicity	:	Low
Bio-accumulative Potential	:	No Data

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## 13. DIsposal Consideration

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Waste Treatment Methods	:	Chemical residues are generally classified as special waste and covered by regulations which vary according to location. Contact your local waste disposal authority for advice, or pass to a chemical disposal company
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## 14. Transport Information

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Hazardous	:	Not hazadous for transportation
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Hazard Class : Non Applicable  
Packing Group : Non Applicable  
UN Number : Non Applicable  
Proper Shipping Name : Non Applicable

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#### 15. Regulatory Information

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Sec 302 Extremely Hazardous : No  
Sec 304 Reportable Quantities : Non Applicable  
Sec 313 Toxic Chemicals : No

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#### 16. Other information

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Revision Date : 8<sup>th</sup> August 2017 by WOOSUK Co.,LTD  
The above information is believed to be correct but does not purport to be all inclusive and must be used only as a guide.