

## MATERIAL SAFETY DATA SHEET (MSDS)

### I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<b>Manufacturer/Supplier:</b>	<b>MAXWORTH MINERAL TRADING PVT LTD</b> Suite No-48-14-116/6, Lakshmi Royal Plaza Fourth Floor, Resapuvanipalem, Visakhapatnam
<b>Trade Names:</b>	Rock garnet, Red River Garnet
<b>Product/Chemical Name:</b>	Garnet Abrasive Grains
<b>Chemical Formula:</b>	$Fe_3Al_2(SiO_2)$ with Mg & Mn in partial substitution for Fe in the formula
<b>Other Designations:</b>	Almandite, Pyrope and Spessartine Garnet
<b>General Use:</b>	Industrial; not limited to abrasives, non-skid components, water filtration

### II. HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

This material is a natural mixture of almandine garnet -  $Fe_3Al_2(SiO_2)$  with Mg and Mn in partial substitution for Fe in the formula, and other trace minerals. The following substances are present and regulated by OSHA or ACGIH limits:

Substance	WT. %	ACGIH TLV	CAS NUMBER
		TWA	
Nuisance Dust	n/a	15 mg/m <sup>3</sup>	n/a
Respirable Dust	n/a	5 mg/m <sup>3</sup>	n/a
Crystalline Silica	<0.5%	0.10 mg/m <sup>3</sup>	n/a

### III. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Reddish brown to pink grains	<b>Avg. Bulk Density:</b>	2.4g/cm <sup>3</sup> (150 lbs/ft <sup>3</sup> )
<b>Particle Shape:</b>	Sub-rounded to angular	<b>Specific Gravity:</b>	4.1 g/cm <sup>3</sup> (H <sub>2</sub> O = 1.0)
<b>Odor:</b>	Not applicable	<b>Melting Point:</b>	1,250°C (2,282°F)
<b>Water Solubility:</b>	Insoluble	<b>Reactivity:</b>	Inert
<b>Hardness:</b>			7.5 – 8.0 Mohs

#### **Maxworth Mineral Trading Pvt. Ltd.**

Suite No: 48-14-116/6, Lakshmi Royal Plaza, Fourth Floor, Resapuvanipalem, VISAKHAPATNAM-530003.  
 Head Office: 37/1989, Bhattathiripad Road, Off Kaloor - Kadavanthara Road, Kaloor, Kochi - 682017, Kerala, India.

<b>IV. SECTION 4 – FIRE AND EXPLOSION HAZARD</b>	
<b>Flash Point:</b>	Material is a non-flammable solid
<b>Flash Point Method:</b>	Not applicable
<b>Flammable Limits:</b>	Not applicable
<b>LEL:</b>	Not applicable
<b>UEL:</b>	Not applicable
<b>Flammability Classification:</b>	Not applicable
<b>Extinguishing Media:</b>	Use extinguishing media appropriate for the surrounding fire.
<b>Special Fire Fighting Procedures:</b>	As appropriate to surrounding, fire fighters should be protected from nuisance dust.
<b>Unusual Fire and Explosion Hazards:</b>	None

#### **V. STABILITY AND REACTIVITY**

<b>Stability:</b>	Stable
<b>Polymerization:</b>	Will not occur
<b>Chemical Incompatibilities:</b>	None known
<b>Hazardous Decomposition products:</b>	None known

#### **VI. HEALTH HAZARD INFORMATION**

<b>Health Hazards (acute and chronic)</b>	None known. Use care to limit possible exposure to nuisance dust during blast cleaning.
<b>Carcinogenicity</b>	Crystalline silica (quartz) – contains less than 0.5%
<b>Inhalation</b>	Dust may cause irritation of the nasal and respiratory tract
<b>Skin</b>	May cause abrasions
<b>Ingestion</b>	None known; however, ingestion is not recommended
<b>Medical Conditions Generally Aggravated by Exposure</b>	Chronic bronchitis, emphysema and other lung diseases may be aggravated by exposure to nuisance dust
<b>EMERGENCY FIRST AID PROCEDURES Inhalation</b>	Remove to fresh air; administer oxygen if breathing is difficult.
<b>Eye Contact</b>	Wash eyes with water to flush out dust particles; obtain medical assistance if needed
<b>Skin Contact</b>	Wash affected area with soap and water.
<b>Ingestion</b>	Obtain first aid or medical assistance, if needed

#### **Maxworth Mineral Trading Pvt. Ltd.**

Suite No: 48-14-116/6, Lakshmi Royal Plaza, Fourth Floor, Resapuvanipalem, VISAKHAPATNAM-530003.

Head Office: 37/1989, Bhattathiripad Road, Off Kaloor - Kadavanthara Road, Kaloor, Kochi - 682017, Kerala, India.

## VII. PRECAUTIONS FOR SAFE HANDLING AND USE

### SPILL /LEAK PROCEDURES

Spills : Sweep or vacuum material for disposal or recovery  
 Disposal : Follow local, state and federal guidelines for disposal of inert solid waste. **MATERIAL CONTAMINATED IN USE MAY REQUIRE SPECIAL HANDLING.**

**Handling/Storage Precautions :** None—use good housekeeping practices to reduce dust; use approved hand, eye and respiratory protection when handling.

**Other Precautions :** Use materials only for the purposes intended and incorporate methods of dust Control to maintain airborne dust within federal or local TLV limits.

## VIII. CONTROL MEASURES

**Ventilation :** Sweep or vacuum material for disposal or recovery.

**Respiratory Protection :** Provide sufficient local exhaust or mechanical (general) ventilation to maintain dust exposure limit below threshold limit value (TLV).

**Eye Protection :** NIOSH/MSHA approved filters and air supplied hoods / helmets for blasters.

**Protective Gloves :** Leather or equivalent – in use.

**Other Protective Clothing or Equipment :** Normal safety protection is adopted.

**Work /Hygienic Practices :** Maintain a clean and safe work environment and monitor work practices.

## TECHNICAL DATA & PHYSICAL CHARACTERISTICS FOR GARNET ABRASIVES

Average Chemical Composition (wt %)	
SiO <sub>2</sub> : 36%	TiO <sub>2</sub> : 2%
Al <sub>2</sub> O <sub>3</sub> : 23%	MnO : 2%
FeO : 27%	CaO : 2%
Fe <sub>2</sub> O <sub>3</sub> : 2%	MgO : 6%

### **Maxworth Mineral Trading Pvt. Ltd.**

Suite No: 48-14-116/6, Lakshmi Royal Plaza, Fourth Floor, Resapuvanipalem, VISAKHAPATNAM-530003.  
 Head Office: 37/1989, Bhattathiripad Road, Off Kaloor - Kadavanthara Road, Kaloor, Kochi - 682017, Kerala, India.

<b>Recommended Blasting Conditions</b>	
Nozzle pressure	90+ psi
Material flow	400-600 lbs/hr
Nozzle size	6/8/10 MM or larger
Work distance	18-24 inches
<b>Mineral Composition (Warranted Limit)</b>	
Garnet	+97.0%
Ilmenite	<0.25%
Zircon	<0.2%
Quartz	<0.1%
Others	<0.25%

<b>Physical Characteristics:</b>	
Bulk density	140-150 lbs/ft <sup>3</sup>
Specific gravity	4.1
Hardness (Mohs)	7.5 - 8.5
Melting point	1,250°C
Particle shape	Sub-rounded to sub-angular

<b>Other Characteristics:</b>	
Conductivity	10-15ms/m (max 25 ms/m)
Radioactivity	Not detectable above background
Moisture Absorption	Non-hygroscopic
Free Iron	Less than 0.01%
Copper	Less than 0.01%
Other Heavy Metals	Less than 0.01%

**Maxworth Mineral Trading Pvt. Ltd.**

Suite No: 48-14-116/6, Lakshmi Royal Plaza, Fourth Floor, Resapuvanipalem, VISAKHAPATNAM-530003.  
 Head Office: 37/1989, Bhattathiripad Road, Off Kaloor - Kadavanthara Road, Kaloor, Kochi - 682017, Kerala, India.