

## MATERIAL SAFETY DATA SHEET

<b>SECTION 1 - MATERIAL IDENTIFICATION AND USE</b>
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**MATERIAL:** CORDIERITE CERAMIC  
**PRODUCT NAME - IDENTIFIER:** INFRARED HEATING TILE

<b>MANUFACTURER NAME:</b>		<b>SUPPLIER NAME:</b>	
Apogee Engineered Ceramics Inc.		Apogee Engineered Ceramics Inc.	
<b>STREET ADDRESS:</b> 396 Henry Street		<b>STREET ADDRESS:</b> 396 Henry Street	
<b>CITY:</b> Brantford, Ontario	<b>COUNTRY:</b> Canada	<b>CITY:</b> Brantford, Ontario	<b>COUNTRY:</b> Canada
<b>POSTAL CODE:</b> N3S 7W1	<b>PHONE:</b> 519-753-0700	<b>POSTAL CODE:</b> N3S 7W1	<b>PHONE:</b> 519-753-0700

<b>CHEMICAL NAME:</b> Magnesium iron aluminum cyclosilicate	<b>CHEMICAL FAMILY:</b> Clay	<b>CHEMICAL FORMULA:</b> (Mg, Fe) <sub>2</sub> Al <sub>4</sub> Si <sub>5</sub> O <sub>18</sub> *nH <sub>2</sub> O
<b>MOLECULAR WEIGHT:</b>	<b>MATERIAL USE:</b> MANUFACTURING END USE	
<b>OXIDE CONTENT:</b>	Al <sub>2</sub> O <sub>3</sub> : 28.10 %	
	SiO <sub>2</sub> : 50.40 %	
	CaO: 0.65 %	
	MgO: 17.6 %	
	NaO <sub>2</sub> : 0.10 %	
	Fe <sub>2</sub> O <sub>3</sub> : 1.31 %	
	TiO <sub>2</sub> : 0.94 %	
	K <sub>2</sub> O: 0.20 %	

<b>SECTION 2 - HAZARDOUS INGREDIENTS</b>
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HAZARDOUS INGREDIENTS	%	UN. NA OR CASE NUMBERS:	LD/50 OF MATERIAL:
N/A	N/A	N/A	N/A
<p><b>NONE</b></p> <p><b>ALL PRODUCTS ARE FIRED TO A MINIMUM OF 1250 °C AND ARE CONSIDERED TO BE CHEMICALLY INERT.</b></p>			

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### SECTION 3 - PHYSICAL DATA

<b>PHYSICAL STATE:</b> GAS ( ) LIQUID ( ) SOLID ( X )		<b>ODOUR AND APPEARANCE:</b> ODOURLESS/YELLOW WHITE		<b>ODOUR THRESHOLD (PPM):</b> N/A
<b>VAPOUR PRESSURE (mm Hg):</b> N/A	<b>FREEZING POINT (°C):</b> N/A	<b>VAPOUR DENSITY (AIR-1):</b> N/A	<b>EVAPORATION RATE:</b> N/A	<b>BOILING POINT (°C):</b> N/A
<b>% VOLATILE (BY VOL.):</b> N/A	<b>SOLUBILITY IN WATER (20 °C):</b> N/A	<b>BULK DENSITY:</b> 1.33 g/cc. TYPICAL	<b>SPECIFIC GRAVITY:</b> 2.55 g/cc	<b>COEFFICIENT WATER OIL DIST:</b> N/A

### SECTION 4 - FIRE AND EXPLOSIVE DATA

<b>FLAMMABILITY</b> YES ( ) NO ( X ): IF YES, UNDER WHICH CONDITIONS?			
<b>MEANS OF EXTINCTION:</b>			
<b>SPECIAL PROCEDURE:</b>			
<b>FLASH POINT (°C) AND METHOD:</b> N/A	<b>UPPER EXPLOSION (% BY VOLUME):</b> N/A	<b>LOWER EXPLOSION LIMIT (% BY VOL.):</b> N/A	
<b>AUTO IGNITION TEMPERATURE (°C):</b> N/A	<b>TDG FLAMMABILITY CLASSIFICATION:</b> N/A	<b>HAZARDOUS COMBUSTION PRODUCTS:</b> N/A	
<b>EXPLOSION DATA: SENSITIVITY TO IMPACT:</b> N/A	<b>SENSITIVITY TO STATIC DISCHARGE:</b> N/A	<b>EXPLOSIVE POWER:</b> N/A	<b>RATE OF BURNING:</b> N/A

### SECTION 5 - REACTIVITY DATA

<b>CHEMICAL STABILITY</b> YES ( X ), NO ( ) IF NO UNDER WHICH CONDITIONS?	
<b>COMPATIBILITY WITH OTHER SUBSTANCES</b> YES ( X ), NO ( ) IF NO, WHICH ONES?	
<b>REACTIVITY UNDER WHICH CONDITIONS:</b>	NON-REACTIVE
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	N/A

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### SECTION 6 - TOXICOLOGICAL PROPERTIES

<b>ROUTE OF ENTRY:</b>					
SKIN CONTACT ( )	SKIN ABSORPTION ( )	EYE CONTACT ( )	INHALATION ACUTE ( X )	INHALATION CHRONIC ( X )	INGESTION ( )
<b>EFFECTS OF ACUTE EXPOSURE TO MATERIAL:</b> NO EFFECT OTHER THAN AS NUISANCE DUST (WHEN MACHINING IS REQUIRED).					
<b>EFFECTS OF CHRONIC EXPOSURE:</b> LONG TERM EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA CAN CAUSE SILICOSIS.					
<b>LD/50 OF MATERIAL:</b>  N/A	<b>LC/50 OF MATERIAL:</b>  N/A	<b>EXPOSURE LIMIT OF MATERIAL:</b>  5 mg/m <sup>3</sup>	<b>IRRITANCY OF MATERIAL:</b>  N/A		
<b>SENSITIZING CAPABILITY OF MATERIAL:</b>  N/A	<b>CARCINOGENICITY OF MATERIAL:</b>  N/A	<b>REPRODUCTIVE EFFECTS OF MATERIAL:</b>  N/A	<b>SYNERGISTIC MATERIALS:</b>  N/A		

### SECTION 7 - PREVENTIVE MEASURES

<b>PERSONAL PROTECTIVE EQUIPMENT:</b> RESPIRATOR RECOMMENDED WHEN DUST IS CREATED DUE TO MACHINING OF FIRED CERAMICS. PROTECTIVE EYE WEAR, GLOVES RECOMMENDED IN CASE OF BROKEN FRAGMENTS.		
<b>GLOVES (SPECIFY):</b>  SEE ABOVE	<b>RESPIRATORY (SPECIFY):</b>  WHERE TLV IS EXCEEDED	<b>EYE (SPECIFY):</b>  SEE ABOVE
<b>FOOTWEAR (SPECIFY):</b> N/A	<b>CLOTHING (SPECIFY):</b> N/A	<b>OTHER (SPECIFY):</b> N/A
<b>ENGINEERING CONTROLS (SPECIFY E.G. VENTILATION ENCLOSED PROCESS):</b> N/A		
<b>LEAK AND SPILL PROCEDURE:</b> N/A		
<b>WASTE DISPOSAL:</b> N/A		
<b>HANDLING PROCEDURES AND EQUIPMENT:</b> N/A		
<b>STORAGE REQUIREMENTS:</b> N/A		
<b>SPECIAL SHIPPING INFORMATION:</b> N/A		

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<b>SECTION 8 - FIRST AID MEASURES</b>
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NOTE: IN CASE OF EYE INJURY OR SEVERE CUTS FROM SHARP BROKEN CERAMIC FRAGMENTS CONSULT PHYSICIAN IMMEDIATELY.

SOURCES USED:
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ADDITIONAL INFORMATION:
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<b>SECTION 9 - PREPARATION DATE OF THE MSDS</b>
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<b>PREPARED BY</b> <b>(GROUP, DEPARTMENT, ETS)</b>	<b>PHONE NUMBER:</b>	<b>DATE PREPARED:</b>
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Production Department. Apogee Engineered Ceramics Inc.	519-753-0700	August 25, 2011
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