


Aerosol Fire Suppressant

SECTION 1: IDENTIFICATION OF THE MATERIAL AND SUPPLIER			
Product Name:	Muster ^{II} Solid Aerosol Fire Suppression Generator	Product Number:	M2SAG-Z3, M2SAG-Z6, M2SAG-1, M2SAG-2, M2SAG-5, M2SAG-10, M2SAG-20, M2SAG-30, M2SAG-50, M2SAG-M-1, M2SAG-M-2, M2SAG-M-5, M2SAG-M-10
Recommended Use:	Fire Suppression	Information Department:	Product Safety Department
Supplier Name:	JSG Industrial System Pty Ltd	Address:	Unit 1, 21 Amour St Revesby 2212 Australia
Telephone No.:	+61 (2) 9914 8727	Website:	www.musterfire.com
Email:	jsgindustrial@jsg.com.au	Date Reviewed:	August 2018

SECTION 2: HAZARDS IDENTIFICATION		
<p>Muster^{II} Solid Aerosol Generator is a non-pressurized metal canister, containing a solid aerosol forming chemical compound. Upon activation of the canister the solid aerosol undergoes a chemical reaction to produce aerosol, which is the actual fire suppressing medium. Condensed aerosol – a suspension of micron sized solid particles, mainly Potassium Carbonates, in a gaseous mixture, mainly Nitrogen</p> <p>SAG/SAG-M modules are classified as Hazardous according to the Globally Harmonized System of Classification and labelling of chemicals (GHS) including Work, Health and Safety Regulations, Australia. Classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition).</p>		
Proper Shipping Name	Flammable Solid, Inorganic, n.o.s (Potassium Nitrate/Melamine/Alpha-D-Glucopyranosyl-Beta-D-Fructofuranoside Mixture)	
UN No.	3178	
Class No.	4.1	
Packaging Group	III	
Hazchem Code	1[T]	
Precautionary Statements	<p>S15 - Keep away from heat</p> <p>S33 - Take precautionary measures against risk of static discharge</p> <p>S35 - This material and its container must be disposed in a safe way</p> <p>S38 - In case of insufficient ventilation wear suitable respiratory equipment</p> <p>S39 - Wear eye/face protection</p> <p>R48 - Danger of serious damage to health by prolonged exposure</p>	
Canister (Housing)	Solid Aerosol Compound	Aerosol
Application of current causes activation	Flammable	Elevated temperatures on release
Heating above 300°C may cause activation	When combusted produces aerosol	High obscuration on release
Upon activation releases aerosol at elevated temperatures		Irritating to eyes and respiratory tracks
Hot surface upon activation		Contains minor quantities of potentially toxic by-products of combustion of the aerosol-generating compound
May be propelled upon activation if not correctly secured		

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Muster^{II} Solid Aerosol Generator is a non-pressurized metal canister, containing a solid aerosol forming chemical compound. Upon activation of the canister the solid aerosol undergoes a chemical reaction to produce aerosol, which is the actual fire suppressing medium. Condensed aerosol – a suspension of micron sized solid particles, mainly Potassium Carbonates, in a gaseous mixture, mainly Nitrogen

Aerosol-Generating Compound				Aerosol (data refers to a maximum design application density of 100g/m ³ , which is 100g of aerosol-generating compound combusted in a 1m ³ sealed enclosure)			
Ingredients	Chemical Compound	Cas-Number	Content %	Ingredients	Chemical compound	Cas-Number	Content Mg/m ³
Potassium Nitrate	KNO ₃	7757-79-1	60-65	Potassium Carbonate	K ₂ CO ₃	584-08-7	8.67
Sucrose	C ₁₂ H ₂₂ O ₁₁	57-50-1	20-25	Nitrogen	N ₂	17778-88-0	
Melamine	C ₃ H ₆ N ₆	108-78-1	5-10	Water Vapour	H ₂ O		60.4
Magnesium Stearate	C ₃₆ H ₇₀ MgO ₄	557-04-0	1-2	Carbon Dioxide	CO ₂	124-38-9	1350
				Carbon Monoxide	CO	630-08-0	1.63
				Nitrogen Oxides	NO _x		10.51
				Ammonium	NH ₃	7664-41-7	2.83
				Sulphur Dioxide	SO ₂	7446-09-5	0.036
				Hydrogen Cyanide	HCN	74-90-8	ND <0.05

SECTION 4: FIRST AID MEASURES

Intake/Contact	Aerosol-Generating Compound	Aerosol
Inhalation	N/A	Remove to fresh air, lie down and rest. If not breathing - apply artificial respiration. Oxygen may be given only under supervision of a trained person. Keep warm and transport to hospital or doctor.
Ingestion	Give water and induce vomiting	N/A
Skin Contact	Wash affected area with water	Wash affected area with water
Eye Contact	N/A	Hold eyes open and wash continuously with water for at least 15 minutes
Burns	Treat affected areas with cold water. If required seek medical attention	Treat affected areas with cold water. If required seek medical attention

SECTION 5: FIRE FIGHTING MEASURES

Canister (Housing)	Solid Aerosol Compound	Aerosol
Activates upon application of electric current or heat above 300°C or naked flame. Produces fire extinguishing aerosol upon activation.	Activates upon application of electric current or heat above 300°C or naked flame. Produces fire extinguishing aerosol upon activation. If amount of aerosol is insufficient and fire gets out of control, use water fog or spray, Carbon Dioxide, Dry Chemical Powder or Foam. Wear respirator and fire protective clothing. Withdraw all personnel from the area and advise against entry.	Extinguishing medium. Does not represent a fire hazard.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Canister (Housing)	Solid Aerosol Compound	Aerosol
<p>Unintended Activation: Clear the area of all personnel. Do not re-enter until the area has been fully ventilated. Wear a respirator in case immediate re-entry is necessary. Follow clean up procedure for Aerosol.</p>	<p>Spills: No smoking or naked flame. Clear the area of all personnel. Do not walk on material. Keep combustibles such as wood, paper, oil etc. away from spilled material. Wearing protective gloves absorb small spills with sand or other non-combustible material for later disposal and then if practicable, hose the area with water. Disposal is in accordance with the national regulations for flammable materials.</p>	<p>Aerosol Residue: Can be brushed, blown or washed away. Can be disposed of into general sewerage.</p>

SECTION 7: HANDLING AND STORAGE

Keep generators in ventilated stores at normal ambient temperatures away from heaters and direct sunlight. If kept in quantities exceeding 1000kg shall be stored in a depot constructed of a non-combustible material.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

AEROSOL

(Data refers to a maximum design application density of 100g/m³, which is 100g of aerosol-generating compound combusted in a 1m³ sealed enclosure)

Potentially hazardous ingredients	Chemical Entity	CAS-No	Content at 100 g/m ³ design application density, mg/m ³	STEL (short-term exposure limit over 15-minute reference period), mg/m ³	LTEL (short-term exposure limit over 15-minute reference period), mg/m ³	Health R phrases (full text for all R-phrases are displayed in Section 15)	Comment
Carbon dioxide	CO ₂	124-38-9	1,350mg/m ³	27,400	9,150		Below LTEL
Carbon monoxide	CO	630-08-0	1.63mg/m ³	232	35	R23, 48/23, 61	Below LTEL
Nitrogen dioxide (most hazardous of NO _x)	NO ₂	10102-44-0	10.51mg/m ³ (for NO _x)	9.6	5.7	R26, 34	Within STEL
Ammonium	NH ₃	7664-41-7	2.83mg/m ³	25	18	R23, 34	Below LTEL
Sulfur dioxide	SO ₂	7446-09-5	0.036mg/m ³	13	5.3	R23, 34	Below LTEL

The limiting ingredient of Muster^{II} aerosol is NO_x. The concentration of NO_x in aerosol at its maximum design application density is within STEL exposure standards limits, therefore, a single continuous exposure to aerosol should not exceed 15 minutes.

ENGINEERING MEASURES

For areas where people may be present provide suitable safeguards such as personnel training, warning signs, pre-discharge alarms and system isolate switches as required by relevant International or national Standards. Provide general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Respiratory protection must be used if entry into protected area where Muster^{II} system had been discharged is necessary before the area has been fully ventilated.

PROTECTIVE CLOTHING

Protective gloves, goggles and clothing should be worn during a cleanup procedure following Muster^{II} system discharge.

OTHER PROTECTION

HOT WORK WARNING! Do not conduct any hot work in area protected with Muster^{II} system unless the aerosol generators have been removed from the area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES			
Parameter	Generator	Aerosol-Generating Compound	Aerosol
Appearance	Stainless steel or red powder coated cylindrical canister	Whitish solid mixture	Smoke-like whitish mixture of micron-sized solids and gases
Odour	No specific odour	No specific odour	Characteristic of combustion products
Density	N/A	1.7 g/cm ³	1.29 g/cm ³
Melting Point	N/A	N/A	N/A
Ignition Temperature	180°C	180°C	N/A
Flash Point	N/A	300°C	N/A
Solubility	N/A	Insoluble in water, reacts with organic solvents, such as acetone	Soluble in water

SECTION 10: STABILITY AND REACTIVITY	
Stability	Stable under normal operating conditions. Protect from fire, electrical power, shock and high temperatures.
Conditions to Avoid	Avoid heat, flames and other sources of ignition. Avoid contact with organic solvents.
Hazardous Decomposition Products	When combusted may produce minor quantities of potentially hazardous carbon monoxide CO and nitrogen oxides NO _x .

SECTION 11: TOXICOLOGICAL INFORMATION		
Parameter	Aerosol-Generating Compound	Aerosol
Inhalation	N/A	Short-term exposure (up to 15 min): irritation to the respiratory tract;
		Long-term exposure (above 15 min): headache, dry cough, dizziness, nausea, irritation to the gastrointestinal tract, shortness of breath
		Prolonged exposure: can be dangerous to life, single continuous exposure is limited to 15 minutes
Skin Contact	Minor skin irritation	Minor skin irritation
Eye Contact	N/A	Moderate irritation of mucous membrane

SECTION 12: ECOLOGICAL INFORMATION	
Hazards to the environment	Zero
Global Warming Potential (GWP)	Zero
Ozone Depletion Potential (ODP)	Zero
Atmospheric Life Time (ALT)	Low
Marine Pollutant	No


SECTION 13: DISPOSAL CONSIDERATIONS

Aerosol-Generating Compound	Aerosol
Should be disposed separately from other materials.	Can be brushed, blown or washed away. Can be disposed of into general sewage.
Disposal is in accordance with the national regulations for flammable materials.	

SECTION 14: TRANSPORT INFORMATION

Proper Shipping Name:	Flammable Solid, Inorganic, n.o.s (Potassium Nitrate mixture)
UN No.	3178
Class No.	4.1
Packaging Instructions	Y443
Hazchem Code	1[T]
Packaging Instructions	<p>Air Transport ICAO-TI and IATA-DGR:</p> <ul style="list-style-type: none"> • Passenger/Cargo planes: Y443 for max 10kg net DG quantity, no UN boxes required • Passenger/Cargo planes: 446 for max 25kg net DG quantity, requires UN boxes; • Cargo only planes: 449 for max 100kg net DG quantity, requires UN boxes; <p>Land Transport ADR/RID (cross-border)</p> <ul style="list-style-type: none"> • ADR/RID class: 3178 • Kemler Hazard Code (EU): 40 • EMS: F-A, S-G <p>Maritime Transport IMDG:</p> <ul style="list-style-type: none"> • Location B

SECTION 15: REGULATORY INFORMATION

Hazard Symbol:		Risk Phrases:	R48 - Danger of serious damage to health by prolonged exposure
		Safety Phrases:	S15 - Keep away from heat
			S33 - Take precautionary measures against risk of static discharge
			S35 - This material and its container must be disposed in a safe way
			S38 - In case of insufficient ventilation wear suitable respiratory equipment
		S39 - Wear eye/face protection	
Product Use:	Classification and labeling have been performed according to EU directives 67/548/EEC, 1999/45/EC including amendments and the intended use.		

EXPOSURE STANDARDS


Reference document for STEL and LTEL/TWA exposure limits: EH40/2000 Occupational Exposure Limits 2000, HSE

STEL

STELs (short term exposure limits) are expressed as airborne concentrations of substances, averaged over a period of 15 minutes. This short term TWA concentration should not be exceeded at any time during a normal eight-hour working day. Workers should not be exposed at the STEL concentration continuously for longer than 15 minutes, or for more than four such periods per working day. A minimum of 60 minutes should be allowed between successive exposures at the STEL concentration.

TWA

Except for short term exposure limits, or where a peak value has been assigned, the exposure standards for airborne contaminants are expressed as a time-weighted average (TWA) concentration of that substance over an eight-hour working day, for a five-day working week.

SECTION 16: OTHER INFORMATION			
General:	This data is based on our present knowledge. However, it shall not constitute a guarantee for any specific product featured and shall not establish a legally valid contractual relationship.	Labelling:	Flammable Solid, Class 4.1 
Product Use:	Product Safety Department	Revision Information:	Revision No 02, Year 2018
Disclaimer:	<p>The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge.</p> <p>NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE.</p> <p>The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.</p>		