MATERIAL SAFETY DATA SHEET
REVIEW No 01, 15.12.2011
PRODUCT: **DEFEND WDG**

SECTION 1: IDENTIFICATION OF PRODUCT AND VENDOR

Product Name	:	DEFEND WDG
Vendor	:	Quimetal Industrial S.A., Los Yacimientos 1301 Maipú, Santiago – Chile
Emergency Telephone	:	(56-2) 381 7000
Fax	:	(56-2) 381 7191

In case of a chemical emergency, sill or fire, call **CITUC Químico** (Center for Information on Chemical Emergencies of the Clinical Hospital of the Pontificia Universidad Católica de Chile), telephone number (56-2) 6353800

In case of intoxication or accidental ingestion, call **CITUC Toxicológico** (Center for Toxicological Information of the Clinical Hospital of the Pontificia Universidad Católica de Chile), telephone number (56-2) 635-3800.

SECTION 2: COMPOSITION OF / INFORMATION ON INGREDIENTS

Chemical Name	:	Sulfur
Chemical Formula	:	S
Synonyms	:	Precipitated Sulfur, Sublimated Sulfur, Flowers of Sulfur
CAS Number	:	7704-34-9
UN Number	:	Not applicable

SECTION 3: HAZARDS IDENTIFICATION

Markings on label: Not required, NCh 382 of 2004, Annex E, special provision 242.
Chemical Product Hazard Classification: Classification IV: Normally, product does not represent a hazard. SAG Resolution 2196, 2000.

a) Hazard to people's health

Effects of acute over-exposure (one time only): Symptoms may appear to be similar to those relating to acute ingestion.
Inhalation: May cause irritation of nose, throat, upper respiratory tract, coughing, sneezing or heavy breathing, if inhaled in large amounts.

Skin contact: Repeated or prolonged contact may cause irritation in some people.
Eye contact: May cause eye irritation and possible conjunctivitis.
Ingestion: This product may act as a laxative, resulting in nausea and vomiting.
Effects of chronic over-exposure (long-term): Chronic exposure to elemental sulfur is generally recognized as safe.
Conditions that can be aggravated with exposure to product: Asthma and respiratory problems, sensitive skin.

b) Hazards to the environment

None, even though lengthy exposure of soil and plants to powder sulfur may be harmful. Product must be used in the recommended dosages and be applied properly.
c) Special product hazards: Under specific conditions, sulfur may decompose and release hydrogen sulfur, which can damage the central nervous system, resulting in headaches, nausea, vomiting, salivation, unconsciousness and death.

SECTION 4: FIRST AID MEASURES

In case of accidental contact with product, proceed as follows:
Inhalation: Move to open air. If victim is not breathing properly, administer artificial respiration. If breathing becomes difficult, administer oxygen. Seek medical help immediately.
Skin contact: Remove contaminated clothing and wash affected area with abundant water and soap, for at least 15 minutes. If irritation persists, repeat washing. Seek medical help.
Eye contact: Flush eyes with abundant water for at least 15 minutes. Lift and separate eyelids to ensure product removal. If irritation persists, repeat flushing. Seek medical help.
Ingestion: Rinse mouth. If victim is fully conscious, give abundant water and induce vomiting. In case of complications, seek medical help immediately.

Notes to treating physician: There is no specific antidote against this product. The medical treatment must symptoms based and aiming at maintaining the general condition.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Agents: Choke fire to exclude air with inert materials, such as fine water sprays or fogs. Apply indirectly, in order to avoid bulk product disturbance and cause particles to be suspended in the air. For localized fires, use carbon dioxide or sand.
Special fire-fighting procedures: Take precautions against the release of toxic gases (sulfurous anhydride). Avoid the dispersion of sulfur dust clouds in the air.

Dust may form explosive mixtures with the air. Dust clouds can burst into flames when in contact with a flame or static discharge.
Fire-fighting personal protection equipment: Use adequate protection clothing and self-contained, positive pressure breathing equipment, especially suited for confined areas.

SECTION 6: MEASURES TO CONTROL SPILLS OR LEAKS

Emergency measures to be taken if material spill occurs: Prevent unnecessary mixture when using cleaning equipment; avoid flattening and creation of dust; reaction with the environment is minimal if product is kept dry and cool. Remove all spilled material and take to appropriate place for cleaning or disposal. Do not dispose of by means of combustion and avoid all sources of spark ignition.
Personal protection equipment to deal with the emergency: Use protective clothing, safety goggles and mask with filter for dust particles.
Precautions to be taken to prevent environmental damages: Prevent runoff to sewers and other water courses. Do not raise dust when picking up the spill.
Cleaning methods: Pick up spill immediately. Sweep without raising dust and dispose of in duly labeled containers.

SECTION 7: HANDLING AND STORAGE

Technical recommendations: Sulphur 80 WG is a fungicide with a secondary acaricide function. This product is slightly toxic, especially indicated to control oidium. Avoid application at high-temperature times.
Precautions: Sulfur has widely recognized corrosive properties and, therefore, electrical equipment should be protected. DO NOT eat or drink while product is being handled; change clothes at the end of the work day, wash hands with abundant water and soap.
Specific recommendations regarding safe handling: Do not expose product to high temperatures and moisture. DO NOT apply product against the wind.
Storage conditions: Store in a safe, cool and dry place, with good ventilation at all times. Storage place rotation can minimize acidity generated, which can result in the corrosion of metals or concrete structural materials.
Packaging recommended and packaging considered as inappropriate by vendor: Recommended packaging should maintain product isolated from environment and moisture. Packaging not recommended includes metallic materials that could be corroded.

SECTION 8: EXPOSURE CONTROL / SPECIAL PROTECTION

Measures to reduce exposure possibilities: Avoid accumulation of dust in the air.
Control parameters:
Weighted and Absolute Permissible Limits: None, as per national standards D.S. No 594.
Breathing protection: If dust problems exist, use approved and certified respiratory device.
Protection gloves: Use water-proof protective gloves.
Eye protection: Use protection goggles to protect from dust or full-face mask, as needed.
Other protection equipment: Use adequate clothing, as per the emergency.
Ventilation: Natural or force ventilation systems should be available at all times.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	: Solid
Appearance and color	: Light brown microgranules
Concentration	: 80% as sulfur
pH	: 8.0 – 9.5, 10% suspension, 20º C
Decomposition temperature	: Information not available
Flash point	: Information not available
Flammability limits	: Information not available
Self-ignition temperature	: Information not available
Fire or explosion hazards	: Fine dust as pure sulfur in the air in sufficient concentrations and in the presence of an ignition source is a potential exposure risk
Vapor pressure at 20ºC	: Information not available
Vapor density	: Information not available
Apparent density	: 0.84 – 0.89 g/cc
Solubility on water and other solvents	: Dispersible in water.

SECTION 10: STABILITY AND REACTIVITY

Stability: Product is stable if stored and handled as recommended.
Conditions to be avoided: Excessive heat, sparks, flames.
Incompatibilities (materials to be avoided): Oxidizing agents, such as peroxides, nitrates, chlorine, permanganates, alkaline metals, ammonium, iron, zinc, nickel, phosphorus, carbons, ammonium nitrate and tin.
Hazardous decomposition products: sulfurous anhydride.
Hazardous polymerization: Does not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Short-term toxicity: LD_{50} oral rats = > 2.000 mg/kg, LD dermal rats = >2.000 mg/kg.
Long-term toxicity: There are no descriptions indicating that product is carcinogenic, teratogenic or mutagenic; product has no effects on reproduction.
Local or systemic effects: The ingestion of large amounts of sulfur may result in a reduction of lung functions.
Allergic sensitization: guinea pig not sensitized after repeated exposures.

SECTION 12: ECOLOGIC INFORMATION

Instability: Product does not react quickly in water or air in the absence of initiators, but is highly corrosive when wet due to the formation of acids.
Persistence / degradability: Elemental sulfur is transformed into sulfate due to the action of autotrophic bacteria; in vegetation, sulfur slowly oxidazes when exposed to the air and participates in microbial reduction reactions.
Bio-accumulation: Product is not bio-accumulative.
Effects on the environment: Sulfur is a natural element; there is a natural cycle of oxide-reduction reactions that transforms sulfur into organic compounds and inorganic compounds.

SECTION 13: CONSIDERATIONS REGARDING FINAL DISPOSAL

Methods recommended and approved by Chilean norms for the final disposal of this substance, residues and wastes: Dispose of substance, residues and wastes in places authorized by the authorities for the disposal of substances; typically, the application of limestone is required.
Methods recommended and approved by Chilean norms for the final disposal of contaminated containers / packaging: dispose of containers as per applicable legislation in effect. It is recommended to wash containers three times and control the acidity and sulfur contents of the water collected from washing, if waters are to be neutralized and filtered.

SECTION 14: TRANSPORT INFORMATION

Land truck or rail transportation: Information not available
Ocean freight: Information not available
Air freight: Information not available
River / lake transportation: Information not available
Applicable markings NCh 2190: Information not available
UN number: Information not available

SECTION 15: APPLICABLE STANDARDS

Applicable international standards: Food and Agricultural Organization Regulations.
Applicable domestic standards: NCh 2190 of 1991, transportation of hazardous substances; Markings for risk identification, NCh 382 of 1989, Hazardous substances – General terminology and classification DS 298 and 198, Transportation of hazardous substances, DS No 594 Rules and regulations on the basic sanitary and environmental conditions at the work place. NCh 2245 of 2003, Chemical substances, Material Safety Data Sheets – Requirements, Resolution 2196 SAG, 2000.
Marking on label: Caution.

SECTION 16: OTHER INFORMATION

All information, recommendations and suggestions herein related to our product are based on reliable testing and data; however, it is the responsibility of the user to determine that the product described herein is compatible with his/her needs from the point of view of toxicity and safety. Given the fact that the effective of the product on the part of third parties is out of our control, we do not provide express or implicit warranty with regard to product use effects; also, we do not assume any responsibility regarding the use given by third parties to the product described herein.

MSDS Reviewed and approved by
Marco Estévez / Quality Control
Pablo Muñoz / Risk Prevention and the Environment