

# VANADIUM OXIDE

VNO

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION
Common Synonyms Vanadium (V) oxide Vanadium pentoxide	Solid, granular or flakes	Red, brown or grey	Odorless	<p><b>4.1 Flash Point:</b> Not flammable.</p> <p><b>4.2 Flammable Limits in Air:</b> Not pertinent.</p> <p><b>4.3 Fire Extinguishing Agents:</b> Use extinguishing agents appropriate for the surrounding fire.</p> <p><b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Not pertinent.</p> <p><b>4.5 Special Hazards of Combustion Products:</b> Intense heat may release sharp, irritating smoke and poisonous fumes of vanadium oxides.</p> <p><b>4.6 Behavior in Fire:</b> Not pertinent.</p> <p><b>4.7 Auto Ignition Temperature:</b> Not pertinent.</p> <p><b>4.8 Electrical Hazards:</b> Not pertinent.</p> <p><b>4.9 Burning Rate:</b> Not pertinent.</p> <p><b>4.10 Adiabatic Flame Temperature:</b> Not pertinent.</p> <p><b>4.11 Stoichiometric Air to Fuel Ratio:</b> Not pertinent.</p> <p><b>4.12 Flame Temperature:</b> Not pertinent.</p> <p><b>4.13 Combustion Molar Ratio (Reactant to Product):</b> Not pertinent.</p> <p><b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed</p>	<p><b>7.1 Grades of Purity:</b> Technical.</p> <p><b>7.2 Storage Temperature:</b> Ambient.</p> <p><b>7.3 Inert Atmosphere:</b> No requirement.</p> <p><b>7.4 Venting:</b> Not listed.</p> <p><b>7.5 IMO Pollution Category:</b> Currently not available</p> <p><b>7.6 Ship Type:</b> Currently not available</p> <p><b>7.7 Barge Hull Type:</b> Currently not available</p>
<b>Fire</b>	Not flammable. Heat of fire may produce poisonous fumes of vanadium oxides. Wear full protective clothing with self-contained breathing apparatus. Use extinguishing agents appropriate for the surrounding fire.				<b>8. HAZARD CLASSIFICATIONS</b>
<b>Exposure</b>	CALL FOR MEDICAL AID. DUST or SOLID Irritating to skin and eyes. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Remove contaminated clothing and shoes. Wash affected areas with soap and water. IF IN EYES: hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, give two glasses of water and induce vomiting.				<p><b>8.1 49 CFR Category:</b> Poison</p> <p><b>8.2 49 CFR Class:</b> 6.1</p> <p><b>8.3 49 CFR Package Group:</b> II</p> <p><b>8.4 Marine Pollutant:</b> No</p> <p><b>8.5 NFPA Hazard Classification:</b> Not listed</p> <p><b>8.6 EPA Reportable Quantity:</b> 1000 pounds</p> <p><b>8.7 EPA Pollution Category:</b> C</p> <p><b>8.8 RCRA Waste Number:</b> P120</p> <p><b>8.9 EPA FWPCA List:</b> Not listed</p>
<b>Water Pollution</b>	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.				<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b>
<b>1. CORRECTIVE RESPONSE ACTIONS</b> Stop discharge Collection Systems: Dredge	<b>2. CHEMICAL DESIGNATIONS</b> 2.1 CG Compatibility Group: Not listed. 2.2 Formula: $V_2O_5$ 2.3 IMO/UN Designation: Currently not available 2.4 DOT ID No.: 2862 2.5 CAS Registry No.: 1314-62-1 2.6 NAERG Guide No.: 151 2.7 Standard Industrial Trade Classification: 52269				<p><b>9.1 Physical State at 15° C and 1 atm:</b> Solid.</p> <p><b>9.2 Molecular Weight:</b> 181.88</p> <p><b>9.3 Boiling Point at 1 atm:</b> 3182°F = 1750°C = 2023°K</p> <p><b>9.4 Freezing Point:</b> 1216.4°F = 658°C = 931°K</p> <p><b>9.5 Critical Temperature:</b> Currently not available</p> <p><b>9.6 Critical Pressure:</b> Currently not available</p> <p><b>9.7 Specific Gravity:</b> 3.34</p> <p><b>9.8 Liquid Surface Tension:</b> Currently not available</p> <p><b>9.9 Liquid Water Interfacial Tension:</b> Currently not available</p> <p><b>9.10 Vapor (Gas) Specific Gravity:</b> Not pertinent.</p> <p><b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> Currently not available</p> <p><b>9.12 Latent Heat of Vaporization:</b> Currently not available</p> <p><b>9.13 Heat of Combustion:</b> Currently not available</p> <p><b>9.14 Heat of Decomposition:</b> Currently not available</p> <p><b>9.15 Heat of Solution:</b> Currently not available</p> <p><b>9.16 Heat of Polymerization:</b> Not pertinent.</p> <p><b>9.17 Heat of Fusion:</b> Currently not available</p> <p><b>9.18 Limiting Value:</b> Currently not available</p> <p><b>9.19 Reid Vapor Pressure:</b> Currently not available</p>
<b>3. HEALTH HAZARDS</b>					<b>NOTES</b>
<p><b>3.1 Personal Protective Equipment:</b> Full covering clothing, chemical protective gloves and approved respirator.</p> <p><b>3.2 Symptoms Following Exposure:</b> Exposure can cause irritation of eyes, nose and throat. May cause coughing, wheezing, headache, chest pain, metallic taste, tremors, abdominal cramps, vomiting, weakness, breathlessness, or sneezing. A greenish discoloration of the tongue may occur.</p> <p><b>3.3 Treatment of Exposure:</b> Get medical attention. INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. EYES: Flush with water for at least 15 min., lifting lids occasionally. SKIN: Remove contaminated clothing and shoes. Wash with soap and water. INGESTION: Give two glasses of water and induce vomiting.</p> <p><b>3.4 TLV-TWA:</b> 0.05 mg/m³ (as respirable dust and fume).</p> <p><b>3.5 TLV-STEL:</b> Not listed.</p> <p><b>3.6 TLV-Ceiling:</b> Not listed.</p> <p><b>3.7 Toxicity by Ingestion:</b> Grade 3; oral rat LD<sub>50</sub> &gt; 70 mg/kg</p> <p><b>3.8 Toxicity by Inhalation:</b> Currently not available.</p> <p><b>3.9 Chronic Toxicity:</b> Repeated or prolonged exposure may cause an allergic skin rash. Poisoning may affect the nervous system, kidneys and lungs.</p> <p><b>3.10 Vapor (Gas) Irritant Characteristics:</b> Not pertinent.</p> <p><b>3.11 Liquid or Solid Characteristics:</b> Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.</p> <p><b>3.12 Odor Threshold:</b> Currently not available</p> <p><b>3.13 IDLH Value:</b> 35 mg V/m³ (dust or fume)</p> <p><b>3.14 OSHA PEL-TWA:</b> Not listed.</p> <p><b>3.15 OSHA PEL-STEL:</b> Not listed.</p> <p><b>3.16 OSHA PEL-Ceiling:</b> 0.5 mg V/m³ respirable dust; 0.1 mg V/m³ fume</p> <p><b>3.17 EPA A EGL:</b> Not listed</p>					

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
NOT PERTINENT			NOT PERTINENT		NOT PERTINENT		NOT PERTINENT

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
INSOLUBLE			NOT PERTINENT		NOT PERTINENT		NOT PERTINENT