TUN 3327GL-1
TUN 3327GT2
TUN WC018X7

SAFETY DATA SHEET (Tungsten Electrodes)

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards. This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard (29 CFR 1910.1200). Other government regulations must be reviewed for applicability to these products.

WARNING: PRODUCT COMPONENTS PRESENT HEALTH AND SAFETY HAZARDS. READ AND UNDERSTAND THIS SAFETY DATA SHEET (S.D.S.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES. This product may contain Chromium and / or Nickel which are listed by OSHA, NTP, or IARC as being a carcinogen or potential carcinogen. Use of this product may expose you or others to fumes and gases at levels exceeding those established by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Occupational Safety and Health Administration (OSHA) The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. **BE SURE TO CONSULT THE LATEST VERSION OF THE SDS. SAFETY DATA SHEETS ARE AVAILABLE FROM WELDMARK / Shaanxi Taibai Tungsten Products Factory.**

STATEMENT OF LIABILITY – DISCLAIMER

To the best of WELDMARK / Shaanxi Taibai Tungsten Products Factory's knowledge, the information and recommendations contained in this publication are reliable and accurate as of the date prepared. However, accuracy, suitability, or completeness are not guaranteed, and no warranty, guarantee, or representation, expressed or implied is made by WELDMARK / Shaanxi Taibai Tungsten Products Factory as to the absolute correctness or sufficiency of any representation contained in this and other publications. WELDMARK / Shaanxi Taibai Tungsten Products Factory assumes no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures are contained in this and other publications, or that other or additional measures may not be required under particular or exceptional conditions or circumstances. Data may be changed from time to time. CAUTION! FUMES MAY BE HARMFUL IF INHALED. FUMES CAN CAUSE RESPIRATORY, SKIN AND EYE IRRITATION. HOT ELECTRODES CAN CAUSE THERMAL BURNS.

SECTION 1 – IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

GHS Product Identifier:	**Tungsten Electrodes for Welding**
Recommended use:	**Welding**
Supplier:	**Shaanxi Taibai Tungsten Products Factory**
Address	**No.1 Taicheng Road, Baoji, Shaanxi, China**
Emergency Telephone No.	**CHEMTREC: 1-800-424-9300**
Information Telephone No.	**86-917-330-4600**
SDS Version Number	**1**
Date of Preparation	**Oct-28-2015**

SECTION 2 - HAZARD IDENTIFICATION

There are no immediate hazards with these electrodes. The chief acute health hazard associated with these products is inhalation of fumes during welding operations. The Inhalation of fumes generated by welding or dusts and powders, formed if grinding operations are performed on the product. Those electrodes that contain Thorium Oxide have a special hazard if dusts or powders are produced and inhaled during use or grinding of tips of the electrodes, as thorium compounds are suspected of being cancer-causing compounds. When exposed to extremely high temperatures, these products will produce irritating oxides of cerium, thorium, tungsten and zirconium. These electrodes present no significant fire hazard; however finely divided metal powder which may be generated during grinding of the tips of electrodes, is highly flammable (especially when exposed to oxidizing compounds at elevated temperatures). In some circumstances, powdered tungsten can be spontaneously flammable.

CARCINOGENICITY STATUS: Chemicals in these electrodes are listed, as follows.
THORIUM OXIDE: IARC-1, Carcinogenic to Humans ZIRCONIUM OXIDE: TLV-A4, Not Classifiable as to Human Carcinogenicity
The other components of these products are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA, and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Thorium Oxide is a component of some of these alloys and is on the Proposition 65 list**. The State of California requires the following information: WARNING: This product may contain chemicals, and when used for welding may produce fumes or gases containing chemicals, known to the State of California to cause cancer, and/or birth defects (or other reproductive harm.)**

SECTION 2 - HAZARD IDENTIFICATION (Continued)

2.1 Classification of the mixture :
The product is placed on the market in solid form

2.1.1 Classification in accordance with GHS-US

STOT-RE 1	H315	Causes skin irritation
STOT-SE 1	H335	May cause respiratory irritation
STOT-RE 1	H372	Causes damage to organs through prolonged or repeated exposure
Aquatic Acute 1	H400	Very toxic to aquatic life
Aquatic Acute 1	H410	Very toxic to aquatic life with long-lasting effects

2.2 Label elements :
GHS-US labelling

Hazard Pictograms (GHS-US) :

GHS07

GHS08

GHS09

Signal word (GHS-US) :

Hazard statements (GHS-US) :

H317 May cause an allergic skin reaction
H319 Causes eye irritation
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H340 Suspected of causing genetic defects
H351 Suspected of causing cancer
H370 Causes damage to organs (kidneys, respiratory system)
H372 Causes damage to through prolonged or repeated exposure
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long-lasting effects

Precautionary statements :

P201 Obtain special instructions before use
P202 Do not handle until all safety precaustions have been read and understood
P260 Do not breathe dust / fume / gas / mist / vapours / spray
P261 Avoid breathe dust / fume / gas / mist / vapours / spray
P264 Wash thoroughly after handling
P270 Do not eat, drink or smoke when using this product
P272 Contaminated work clothing should not be allowed out of the workplace
P273 Avoid release into the environment
P280 Wear protective gloves
P284 In case of inadequate ventilation wear respiratory protection
P308+P313 IF exposed : Call a POISON CENTER or doctor / physician
P305+P351+P338 IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. If eye irritation persists seek medical advice / attention
P342+P311 IF experiencing respiratory symptoms : Call a POISON CENTER and / or doctor / physician
P302+P352 IF ON SKIN : Wash with plenty of soap and water
P333+P313 IF skin irritation or rash occurs : Get medical advice / attention
P363 Wash contaminated clothing before reuse
P308+P311 IF exposed or concerned : Seek medical advice / attention. Collect spillage
P402+P404 Store in a dry place. Store in a closed container

For thoriated tungsten electrodes, store in tightly closed containers in a cool and well-ventilated area. Nobody should remain permanently or longer than necessary in close proximity to the stored thoriated tungsten electrodes as the electrodes may emit alpha, beta and gamma radiation. Additional measures should be taken to protect from such possible alpha, beta and gamma radiation. Thoriated tungsten electrodes may be incompatible with some strong acids.

P501 Dispose of contents and container in accordance with local regional / national international regulations.

2.3 Other hazards : No additional information available
2.4 Unknown acute toxicity (GHS-US) : No data available

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

TRADE NAME	Tip Color	W (Min.)	CeO_2	La_2O_3	ThO_2	ZrO_2
PURE TUNGSTEN	Green	99.5				
1% THORIATED TUNGSTEN	Yellow	98.3			0.8-1.2	
2% THORIATED TUNGSTEN	Red	97.3			1.7-2.2	
1% LANTHANATED TUNGSTEN	Black	98.3		0.8-1.2		
1.5% LANTHANATED TUNGSTEN	Gold	97.8		1.3-1.7		
2% LANTHANATED TUNGSTEN	Blue	97.3		1.8-2.2		
2% CERIATED TUNGSTEN	Gray	97.3	1.8-2.2			
0.3% ZIRCONIATED TUNGSTEN	Brown	99.1				0.15-0.40

SECTION 4 - FIRST-AID MEASURES

SKIN: If the product's fumes irritate the skin, begin decontamination with running water. Minimum flushing is for 15 minutes.
EYES: If the product's fumes irritate the eyes, flush eyes under gently running water. Minimum flushing is for 15 minutes.
INHALATION: Move victim to fresh air. If necessary, use artificial respiration.
INGESTION: If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel.
Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.
VICTIMS OF CHEMICAL EXPOSURE MUST BE TAKEN FOR MEDICAL ATTENTION, ESPECIALLY IF ADVERSE EFFECTS CONTINUE AFTER FIRST-AID TREATMENT.

SECTION 5 - FIRE-FIGHTING MEASURES

5.1 Extinguishing media :
Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media : No data available.
5.2 Special hazards arising from the substance or mixture : Fire may produce irritating or poisonous gases.
Fire hazard : Not flammable.
Explosion hazard : None known.
5.3 Advice for fire-fighting : In the event of fire, wear self-contained breathing apparatus and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures :
For non-emergency personnel : Wear appropriate personal protective equipment as specified in Section 8. Ensure adequate ventilation.
For emergency responders : No data available.
6.2 Environmental precautions : Avoid release into the environment. Avoid dispersal of spilled material and contact with soil, ground and surface water drains and sewers.
6.3 Methods and material for containment and cleaning up : Take up mechanically. Collect the material in labelled containers and dispose of according to local and regional authority requirements.
6.4 Reference to other sections : See Section 7 for information of safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

SECTION 7 - HANDLING and STORAGE

All employees who handle these materials should be trained to handle them safely. Avoid breathing fumes during welding operations. Store these electrodes in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible chemicals (see Section 10, Stability and Reactivity). Inspect all incoming containers before storage to ensure they are properly labeled and not damaged. If these products are used during welding operations, it is recommended that the requirements of the Federal Occupational Safety and Health Welding and Cutting Standard (29 CFR 1910 Subpart Q) and the Standards of the American National Standards Institute for Welding and Cutting (ANSI Z49.1) be followed. Use ventilation and other engineering controls to minimize potential exposure to fumes during welding operations or to dusts if tips of electrodes are ground. Follow good housekeeping practices to ensure powders or dusts from grinding operations do not accumulate, which can be highly flammable and can pose special health hazards if from thorium-containing electrodes. Tungsten-Thorium Oxide alloys are generally safe to handle during use and almost all normal conditions and environments. **Special precautions must be taken during the grinding or machining of tips of electrodes that contain Thorium Oxide to avoid the generation and subsequent inhalation of dusts from these operations. Any dusts generated during these operations may be considered as "Source Material", as defined by the Nuclear Regulatory Commission, and therefore be subject to the requirements of 10 CFR,** Parts 20 and 40. Routine wet mopping or vacuuming with an explosion-proof vacuum, fitted with a HEPA filter may be considered to reduce accumulation of dusts.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE INFORMATION

CHEMICAL	CAS # % w/w	ACGIH-TLV mg/m^3	OSHA-PEL mg/m^3	NIOSH-REL mg/m^3
Tungsten The exposure limits provided are for "Tungsten and Insoluble Compounds"	7440-33-7 97.3-99.5%	TWA = 5 STEL = 10	TWA = 5 (Vacated 1989 PEL) STEL = 10 (Vacated 1989 PEL)	TWA = 5 STEL = 10
Cerium Oxide (CeO_2)	1306-38-3 1.8-2.2%	NE	NE	NE
Lanthanum Oxide (La_2O_3)	1312-81-8 0.8-2.2	NE	NE	NE
Thorium Oxide (ThO_2)	1314-20-1 0.8-2.2	NE	NE	NE
Zirconium Oxide (ZrO_2) The exposure limits provided are for "Zirconium Compounds, as Zr" (CAS # 7440-67-7)	1314-23-4 0.15-0.40	TWA = 5, A4 (Not Classifiable as a Human Carcinogen) STEL = 10, A4 (Not Classifiable as a Human Carcinogen)	TWA = 5 STEL = 10 (Vacated 1989 PEL)	TWA = 5 STEL = 10

NE = Not Established.

NOTE: Fumes may be generated during the use of these electrodes. To appropriately assess inhalation hazards, one recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample in the workers breathing zone. See ANSI/AWS F1.1, from the American Welding Society, 550 NW Lejeune Rd., Miami, FL 33126.

SARA SECTION 313 SUPPLIER INFORMATION: These products contain the following chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (per 40 CFR 372). Thorium Oxide

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available.

RESPIRATORY PROTECTION: If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the appropriate standards of Canada and its Provinces. It is suggested that NIOSH guidelines for Welding Fumes are followed. For further information, see full **SDS** for these products.

EYE PROTECTION: Safety glasses. When used during welding, wear safety glasses, goggles or face-shield with filter lens of appropriate shade number (per ANSI Z49.1, "Safety in Welding and Cutting", as necessary.

HAND PROTECTION: Wear gloves that will protect against heat of metal product.

BODY PROTECTION: None needed for normal circumstances of use. Use body protection appropriate for task (i.e., leather apron, and coveralls).

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY : Not applicable.
EVAPORATION RATE: Not applicable.
SPECIFIC GRAVITY (water = 1) : 19.3.
MELTING POINT: 3410°C (6170°F).
SOLUBILITY IN WATER: Insoluble. **BOILING POINT:** 5927°C (10701°F).
VAPOR PRESSURE: Not applicable. **pH:** Not applicable
APPEARANCE AND COLOR: These electrodes are hard, brittle, silvery-gray, odorless metal electrodes.

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Stable.
DECOMPOSITION PRODUCTS: Tungsten oxide compounds may be generated.
MATERIALS WITH WHICH PRODUCTS ARE INCOMPATIBLE: Tungsten is not compatible with halogens and strong oxidizers (i.e. sulfuric acid, nitric acid).
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

Information on toxicological effects:
Acute toxicity: Harmful if swallowed

Substance name	CAS #	LD50 oral rat (mg/kg)	ATE (oral) (mg/kg)	Comments
Tungsten	7440-33-7			No data
Cerium Oxide	1306-38-3			No data
Lanthanum Oxide	1312-81-8			No data
Thorium Oxide	1314-20-1			No data
Zirconium Oxide	1314-23-4			No data

Skin corrosion / irritation: Not classified
Serious eye damage / irritation: Not classified
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: May cause cancer

Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): May cause drowsiness or dizziness. May cause respiratory irritation
Specific target organ toxicity (repeated exposure): Causes damage to organs through prolonged or repeated exposure
Aspiration hazard: Not classified

SECTION 12 – ECOLOGICAL INFORMATION

12.1 Toxicity :
Ecology – general : Very toxic to aquatic life.

12.2 Persistence and degradability : No additional information available.
12.3 Bioaccumulative potential : No additional information available.
12.4 Mobility in soil : No additional information available.
12.5 Other adverse effects : No additional information available.

SECTION 13 – DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods : Dispose of in accordance with local and national regulations.
13.2 Waste disposal recommendations: Dispose of contents/container in accordance with local / regional / national / international regulations.

SECTION 14 – TRANSPORT INFORMATION

In accordance with DOT / ADR / RID / ADNR / IMDG / ICAO / IATA
14.1 UN Number : Not a dangerous good in sense of transport regulations.
14.2 UN proper shipping name : Not applicable.

SECTION 15 – REGULATORY INFORMATION

15.1 US Federal Regulations :

Tungsten	**(CAS No.) 7440-33-7**
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
Cerium Oxide	**(CAS No.) 1306-38-3**
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
Lanthanum Oxide	**(CAS No.) 1312-81-8**
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
Thorium Oxide	**(CAS No.) 1314-20-1**
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
Zirconium Oxide	**(CAS No.) 1314-23-4**
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	

SECTION 15 – REGULATORY INFORMATION (Continued)

15.2 US State Regulations :

Thorium Oxide	(CAS No.) 1314-20-1			
U.S. – California – Proposition 65 – Carcinogens List	U.S. – California – Proposition 65 – Developmental Toxicity	U.S. – California – Proposition 65 – Reproductive Toxicity - Female	U.S. – California – Proposition 65 – Reproductive Toxicity - Male	No Significance risk level (NSRL)
Yes				

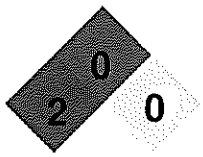
Tungsten	(CAS No.) 7440-33-7
U.S. – Massachusetts – Right to Know List U.S. – Minnesota – Hazardous Substance List U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List	
Cerium Oxide	**CAS No.) 1306-38-3**
U.S. – Massachusetts – Right to Know List U.S. – Minnesota – Hazardous Substance List U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List	
Lanthanum Oxide	**(CAS No.) 1312-81-8**
U.S. – Massachusetts – Right to Know List U.S. – Minnesota – Hazardous Substance List U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List	
Thorium Oxide	**(CAS No.) 1314-20-1**
U.S. – Massachusetts – Right to Know List U.S. – Minnesota – Hazardous Substance List U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List	
Zirconium Oxide	**(CAS No.) 1314-23-4**
U.S. – Massachusetts – Right to Know List U.S. – Minnesota – Hazardous Substance List U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List	

SECTION 16 - OTHER INFORMARTION

Full text of H-phrases :

Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Cara. 1A	Carcinogenicity, Category 1A
Eye Irrit. 2A	Serious eye damage / eye irritation Category 2A
Skin Irrit. 2A	Sensitisation – Skin corrosion / irritation, Category 2
Skin Sens. 1	Sensitisation – Skin Category 1
STOT-RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT-SE 3	Specific target organ toxicity – Single exposure, Category 3, Narcosis
STOT-SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H301	Toxic if swallowed
H302	Harmful if swallowed
H315	Causes skin irritation
H317	May cause all allergic skin reaction
H319	Causes serious eye irritation
H330	Fatal if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life

NFPA health hazard : 2 – Warning may be harmful if inhaled or adsorbed
NFPA fire hazard : 0 – Materials that will not burn
NFPA reactivity : 0 – Normally stable, even under fire exposure conditions, and are not reactive with water



HMIS III Rating

Health : 3 – Major Hazard – major injury likely unless prompt action is taken and medical treatment given
Flammability : 0 – Minimal hazard
Physical : 0 – Minimal hazard

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DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a SDS. Some of these, which are commonly used, include the following:
CAS #: This is the Chemical Abstract Service Number, which uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR :

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value – an airborne concentration of a substance, which represents conditions under which it is generally believed that nearly all workers, may be repeatedly exposed without adverse effect. The duration the must be considered, including the 8-hour Time Weighted Average **(TWA)**, by the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.
OSHA - U.S. Occupational Safety and Health Administration. **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA.The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register : 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL, which was vacated by Court Order. **IDLH** - Immediately Dangerous to Life and Health – This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration **(OSHA)**. NIOSH issues exposure guidelines called Recommended Exposure Levels **(RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS :

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM : Health Hazard : **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard : **0** (minimal hazard) ; **1** (materials that require substantial pre-heating before burning) ; **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]; **3** (Class IB and 1C flammable liquids with flash points below 38°C [100°F]; **4** (Class 1A flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. **Reactivity Hazard** : **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).
NATIONAL FIRE PROTECTION ASSOCIATION : Health Hazard : **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual inquiry). Flammability Hazard and Reactivity Hazard : Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR :

Much of the information related to fire and explosion is derived from the National Fire Protection Association **(NFPA)**. Flash Point – Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION :

Human and Animal Toxicology : Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material
Per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo, LDLo**, and **LDo**, or **TC, TCo, LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information** : The sources are: **IARC** - the International Agency for Research on Cancer ; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information** : **BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. **Ecological Information** : EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in like forms which consume contaminated plant or animal matter. Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION :

This section explains the impact of various laws and regulations on the material. **U.S.** : **EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute **(ANSI Z129.1)**. **CANADA : CEPA** is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDSL** are the Canadian Domestic/Non-Domestic Substances Lists. **The CPR is the Canadian Product Regulations**. This section also includes information on the precautionary warnings, which appear, on the materials package label.

WD4 110078

Safety Data Sheet
California CARB Compliant

1 - Identification

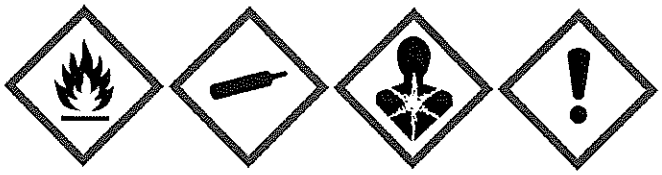
Product Name: WD-40 Multi-Use Product Aerosol **Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion** **Restrictions on Use: None identified** **SDS Date Of Preparation: March 5, 2019**	**Manufacturer: WD-40 Company** **Address: 9715 Businesspark Avenue San Diego, California, USA 92131** **Telephone:** **Emergency: 1-888-324-7596** **Information: 1-888-324-7596** **Chemical Spills: 1-800-424-9300 (Chemtrec)** **1-703-527-3887 (International Calls)**

2 – Hazards Identification

Hazcom 2012/GHS Classification:
Flammable Aerosol Category 1
Gas Under Pressure: Compressed Gas
Aspiration Toxicity Category 1
Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)

Note: This product is a consumer product and is labeled in accordance with the US Consumer Product Safety Commission regulations which take precedence over OSHA Hazard Communication labeling. The actual container label will not include the label elements below. The labeling below applies to industrial/professional products.

Label Elements:



DANGER!
Extremely Flammable Aerosol.
Contains gas under pressure; may explode if heated.
May be fatal if swallowed and enters airways.
May cause drowsiness or dizziness.

Prevention
Keep away from heat, sparks, open flames, hot surfaces. – No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
Avoid breathing vapors or mists.
Use only outdoors or in a well-ventilated area.

Response
IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.

Storage
Store locked up.
Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store in a well-ventilated place.

Disposal
Dispose of contents and container in accordance with local and national regulations.

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	US Hazcom 2012/ GHS Classification
LVP Aliphatic Hydrocarbon	64742-47-8	45-50%	Aspiration Toxicity Category 1
Petroleum Base Oil	64742-56-9 64742-65-0 64742-53-6 64742-54-7 64742-71-8	<35%	Not Hazardous
Aliphatic Hydrocarbon	64742-47-8	<25%	Flammable Liquid Category 3 Aspiration Toxicity Category 1 Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)
Carbon Dioxide	124-38-9	2-3%	Simple Asphyxiant Gas Under Pressure, Compressed Gas

Note: The specific chemical identity and exact percentages are a trade secret.

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.
Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.
Signs and Symptoms of Exposure: Harmful or fatal if swallowed. Aspiration of liquid into the lungs during swallowing or vomiting may cause lung damage. May cause eye and respiratory irritation. Inhalation of mists or vapors may cause drowsiness, dizziness and other nervous system effects. Skin contact may cause drying of the skin.
Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.
Specific Hazards Arising from the Chemical: Extremely flammable aerosol. Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.
Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.
Methods and Materials for Containment/Cleanup: Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.
Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials. Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
LVP Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m3 TWA (Inhalable) ACGIH TLV (as Mineral oil) 5 mg/m3 TWA OSHA PEL (as Oil mist, mineral)
Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA, 30,000 ppm STEL ACGIH TLV 5000 ppm TWA OSHA PEL

The Following Controls are Recommended for Normal Consumer Use of this Product
Appropriate Engineering Controls: Use in a well-ventilated area.
Personal Protection:
Eye Protection: Avoid eye contact. Always spray away from your face.
Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended
Appropriate Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
Personal Protection:
Eye Protection: Safety goggles recommended where eye contact is possible.
Skin Protection: Wear chemical resistant gloves.
Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8%
Odor:	Mild petroleum odor	Vapor Pressure:	95-115 PSI @ 70°F
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 @ 60°F
Melting/Freezing Point:	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	361 - 369°F (183 - 187°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	138°F (59°C) Tag Closed Cup (liquid)	Autoignition Temperature:	Not established

Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas):	Flammable Aerosol	Viscosity:	2.79-2.96 cSt @ 100°F
VOC:	24.1% MIR=0.43gO3/gVOC	Pour Point:	-63°C (-81.4°F) ASTM D-97

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions
Chemical Stability: Stable
Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:
Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.
Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
Chronic Effects: None expected.
Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.
Reproductive Toxicity: None of the components is considered a reproductive hazard.
Numerical Measures of Toxicity:
Acute Toxicity Estimates: Oral > 5,000 mg/kg; Dermal >2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available; however components of this product are not expected to be harmful to aquatic organisms
Persistence and Degradability: Components are readily biodegradable.
Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.
Mobility in Soil: No data available
Other Adverse Effects: None known

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Do not puncture or incinerate containers, even empty. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: UN1950, Aerosols, 2.1 Ltd. Qty
(Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)
IMDG Shipping Description: UN1950, Aerosols, 2.1, LTD QTY
ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1

NOTE: WD-40 Company does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

15 – Regulatory Information

U.S. Federal Regulations:
CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.
SARA TITLE III:
Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure
Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None
Section 302 Extremely Hazardous Substances (TPQ): None
EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not require a California Proposition 65 warning.
VOC Regulations: This product complies with the consumer product VOC limits of CARB, the US EPA and states adopting the OTC VOC rules.
Canadian Environmental Protection Act: All of the ingredients are listed on the Canadian Domestic Substances List or exempt from notification

16 – Other Information

HMIS Hazard Rating:
Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Physical Hazard – 0 (minimal hazard)

Revision Date: March 5, 2019 Supersedes: July 19, 2018

Revision Summary: Section 9 update VOC data

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

Reviewed by: I. Kowalski Regulatory Affairs Dept.

1012200/No.0084704

W+R 541-A066

WALTER
Surface Technologies

SAFETY DATA SHEET

SECTION 1) IDENTIFICATION

Product Name:	Surfox-G		
SDS No.:	S-10		
Product Code:	54-A 061 (100mL), 54-A 063 (500mL), 54-A 065 (1.5 L), 54-A 066 (5L), 54-A 067 (20L), 54-A 068 (208L)		
Revision Date:	Jul 07, 2021	Date Printed:	Jul 13, 2021
Version:	1.0	Supersedes Date:	N.A.
Manufacturer's Name:	Canada - Walter Surface Technologies Inc.		
Address:	5977 Trans Canada Highway West Pointe-Claire, QC, CA, H9R 1C1		
Emergency Phone:	INFOTRAC® 1-800-535-5053. International call collect: 1-352-323-3500 24 hours/day, 7 days/week.		

Information Phone Number: www.walter.com

Fax:

Product/Recommended Uses: Removes heat tint from welded areas on stainless steel and dissolves free iron to enhance passivation

SECTION 2) HAZARDS IDENTIFICATION

Classification of the substance or mixture

Not a hazardous substance or mixture according to United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200).

Hazards Not Otherwise Classified (HNOC) (Physical & Health)

No data available

SECTION 3) COMPOSITION/INFORMATION ON INGREDIENTS

CAS	Chemical Name	% By Weight
0007758-29-4	SODIUM PHOSPHATE, TRIBASIC	3.00% - 7.00%

Specific chemical identity and/or exact percentage (concentration) of the composition has been withheld to protect confidentiality.

SECTION 4) FIRST-AID MEASURES

Inhalation

Remove source of exposure or move person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell or are concerned.

Eye Contact

If irritation occurs, cautiously rinse eyes with lukewarm, gently flowing water for 5 minutes, while holding the eyelids open. If eye irritation persists: Get medical advice/attention.

Skin Contact

Rinse/wash with lukewarm, gently flowing water and mild soap for 5 minutes or until product is removed. If skin irritation occurs or you feel unwell: Get medical advice/attention.

Ingestion

If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Never give anything by mouth to an unconscious person. Rinse mouth. If you feel unwell/If concerned: Get medical advice/attention.

Most Important Symptoms and Effects, Both acute and Delayed

OVER-EXPOSURE SIGNS/SYMPTOMS
Eye Contact: Adverse symptoms may include pain or irritation, watering, redness.
Skin Contact: Adverse symptoms may include pain or irritation, redness.
Ingestion: Adverse symptoms may include stomach pains.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Small Fire : Dry chemical, foam, carbon dioxide, water-spray or alcohol-resistant foam. Large Fire: Dry chemical, CO2, alcohol resistant foam or water spray Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unsuitable Extinguishing Media

Do not use water jet.

Specific Hazards in Case of Fire

In case of fire, hazardous decomposition products may include carbon oxides. Dense smoke may be generated while burning.

Fire-Fighting Procedures

Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray is recommended to cool or protect exposed materials or structures. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Special Protective Actions

Wear protective pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Isolate hazard area and keep unauthorized personnel away. Do not touch or walk through spilled material. Ventilate closed spaces before entering.

Recommended Equipment

See section 8 for specifics on protective personal equipment (PPE).

Personal Precautions

Avoid breathing vapor or mist. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning Up

Stop spill/release if it can be done safely. Move containers from spill area. Dilute with water and mop up if water-soluble. Dispose of contaminated materials according to federal, state and local regulations. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.

SECTION 7) HANDLING AND STORAGE

General

Avoid breathing vapor or mist. Avoid contact with skin, eye or clothing. Eating, drinking and smoking in work areas is prohibited. Remove contaminated clothing and protective equipment before entering eating areas. Use good personal hygiene practices. Wash hands after use.

Ventilation Requirements

Report ventilation failures immediately. Use only with adequate ventilation to control air contaminants to their exposure limits.

Storage Room Requirements

Use appropriate containment to avoid environmental contamination. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Store in cool, dry, well-ventilated areas away from heat, direct sunlight and strong oxidizers. Keep container(s) tightly closed and properly labeled. Containers that have been opened must be carefully resealed to prevent leakage.

SECTION 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Wear eye protection with side shields or goggles.

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over- boots of chemically impervious materials such as neoprene or nitrile rubber.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Chemical Name	ACGIH TWA (mg/m3)	ACGIH TWA (ppm)	ACGIH STEL (mg/m3)	ACGIH STEL (ppm)	ACGIH Carcinogen	ACGIH TLV Basis	ACGIH Notations	OSHA TWA (mg/m3)
Chemical Name	OSHA TWA (ppm)	OSHA STEL (mg/m3)	OSHA STEL (ppm)	OSHA Carcinogen	OSHA Tables (Z1, Z2, Z3)	OSHA Skin designation	CAN_ONtmg	CAN_ONtppm
Chemical Name	CAN_ONsmg	CAN_ONsppm	NIOSH STEL (ppm)	NIOSH TWA (mg/m3)	NIOSH TWA (ppm)	NIOSH STEL (mg/m3)	NIOSH Carcinogen	

The information in this Section does not list non-hazardous components that might have relevant NIOSH TWA (mg/m3), CAN_ONtmg regulatory values, if they are present at less than 1%. Please contact manufacturer for more information.

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	1.25-1.32 g/ml @ 20°C (68°F)
Specific Gravity	N/A
% VOC	0.00000%
Density VOC	N/A
Appearance	Liquid (Pale)
Odor Threshold	N/A
Odour	Odorless
pH	6 - 7
Water Solubility	Soluble in the following materials: cold water and hot water.
Flammability	N/A
Flash Point Symbol	N/A
Flash Point	Closed cup: >93.3°C (>199.9°F)
Viscosity	N/A
Lower Explosion Level	N/A
Upper Explosion Level	N/A
Vapor Density	N/A

Freezing Point	N/A
Melting Point	N/A
Initial Boiling Point and Boiling Point Range	N/A
Auto Ignition Temp	N/A
Evaporation Rate	N/A
Coefficient Water/Oil	N/A
Vapor Pressure	N/A
Decomposition Pt	N/A

SECTION 10) STABILITY AND REACTIVITY

Stability

Stable under normal storage and handling conditions.

Conditions To Avoid

Avoid heat, sparks, flame, high temperature and contact with incompatible materials.

Hazardous Reactions/Polymerization

No data available.

Incompatible Materials

Strong bases, acids, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon.

SECTION 11) TOXICOLOGICAL INFORMATION

Acute Toxicity

Based on available data, the classification criteria are not met.

The Acute Toxicity Estimate (ATE) for an oral exposure to this mixture is >5000 mg/kg body weight

The Acute Toxicity Estimate (ATE) for a dermal exposure to this mixture is >5000 mg/kg body weight

The Acute Toxicity Estimate (ATE) for an inhalation (vapour) exposure to this mixture is >20 mg/l

Aspiration Hazard

Based on available data, the classification criteria are not met.

Carcinogenicity

Based on available data, the classification criteria are not met.

Germ Cell Mutagenicity

Based on available data, the classification criteria are not met.

Reproductive Toxicity

Based on available data, the classification criteria are not met.

Respiratory/Skin Sensitization

Based on available data, the classification criteria are not met.

Serious Eye Damage/Irritation

OVER-EXPOSURE SIGNS/SYMPTOMS: Adverse symptoms may include pain or irritation, watering, redness.

Based on available data, the classification criteria are not met.

Skin Corrosion/Irritation

OVER-EXPOSURE SIGNS/SYMPTOMS: Adverse symptoms may include pain or irritation, redness.

Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Repeated Exposure

Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Single Exposure

Based on available data, the classification criteria are not met.

Likely Routes of Exposure

Inhalation, Ingestion, Skin contact, Eye contact

SECTION 12) ECOLOGICAL INFORMATION

Toxicity

Based on available data, the classification criteria are not met.

0001310-58-3 POTASSIUM HYDROXIDE

LC50(Fish - Gambusia Affinis , 96 hrs) : 80 mg/L

Mobility in Soil

No data available.

Bioaccumulative Potential

No data available.

Persistence and Degradability

No data available.

Other Adverse Effects

No data available.

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. It is the responsibility of the user of the product to determine at the time of disposal whether the product meets local criteria for hazardous waste. Waste management should be in full compliance with national, state and local laws.

SECTION 14) Transport Information

	IATA Information	IMDG Information	U.S. DOT Information	Canada TDG Information
UN number:	Not Regulated	Not Regulated	Not Regulated	Not Regulated
Proper shipping name:	N/A	N/A	N/A	N/A
Hazard class:				Not Applicable
Hazard class:	Not Applicable	Not Applicable	Not Applicable	
Packaging group:	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Hazardous substance (RQ):			No Data Available	
Marine Pollutant:	NA	No Data Available	No Data Available	No Data Available
Note / Special Provision:	No Data Available	No Data Available	No Data Available	No Data Available
Toxic-Inhalation Hazard:	NA	NA	No Data Available	No Data Available

SECTION 15) REGULATORY INFORMATION

California Proposition 65

Prop 65: No products found

CAS	Chemical Name	% By Weight	Regulation List
0007758-29-4	SODIUM PHOSPHATE, TRIBASIC	3.00% - 7.00%	Canada_NPRI,DSL,CERCLA,SARA312,TSCA

The information in this Section does not list non-hazardous components that might have relevant Canada_NPRI, CERCLA, DSL, SARA312, TSCA regulatory values, if they are present at less than 1%. Please contact manufacturer for more information.

SECTION 16) OTHER INFORMATION

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists; CAS - Chemical Abstracts Service ; Chemtrec - Chemical Transportation Emergency Center; DSL - Domestic Substances List; ESL- Effects screening levels; GHS - "Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations; HMIS - Hazardous Material Information Service; IATA - Dangerous Goods Regulations (DGR) for the air transport (IATA); IMDG - International Maritime Dangerous Goods Code; LC - Lethal Concentration; LD - Lethal Dose; NFPA - National Fire Protection Association; OEL - Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL - Permissible Exposure Limit; SARA 313 - Superfund Amendments and Reauthorization Act, Section 313; SCBA - Self Contained Breathing Apparatus; ppm - parts per million; STEL - Short-term exposure limit; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act Public Law 94-469; TWA - Time-weighted average; US DOT- US Department of Transportation.

Version 1.0:

Revision Date: Jul 07, 2021

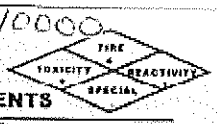
First Edition.

DISCLAIMER

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

ZRC 10000

ZRC GALVANIZING COMPOUND (AEROSOL) MATERIAL SAFETY DATA SHEET NFPA HAZARD RATING ZRC 10000



SECTION 1 - PRODUCT IDENTIFICATION

Product Identifier: ZRC Galvanizing Compound
Product Class: Esterified Epoxy Based Zinc-Rich Metal Primer
Product Identification Number (PIN): 10000
Manufacturer's Name: ZRC Worldwide
Address: 145 Enterprise Drive, Marshfield, MA 02050
Emergency Telephone No.: 781-319-0400 Business Hours
Chemtrec 24 hrs. 1-800-424-9300
Date of Preparation: January 25, 2001

SECTION 2 – HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	% (wt)	LEL	ACGIH TLV ppm (mg/M³)	OSHA PEL ppm (mg/M³)	VP MMHG @20°C
*Zinc (CAS # 7440-66-6)	44	na	Not Established	TWA 50 (15) (Total dust in Mppcf)	na
*Acetone (CAS # 67-64-1)	20	2.6	TWA 750 (1780) STEL 1000 (2380)	TWA 750 (1780) STEL 1000 (2380)	185.00
Propane (CAS # 74-98-6)	10	2.2	TWA 1000 (1800)	TWA 1000 (1800)	5585.20
Petroleum Distillates (CAS # 8052-41-3)	7	0.7	TWA 100 (526)	TWA 100 (526)	2.00
*Methyl Ethyl Ketone (CAS # 78-93-3)	6	1.8	TWA 200 (590) STEL 300 (885)	TWA 200 (590)	85.00
N-Butane (CAS # 106-97-8)	5	1.8	TWA 800 (1900)	TWA 800 (1900)	879.10
Zinc Oxide (CAS # 1314-13-2)	1	na	TWA(fume) (5) STEL(fume) (10)	TWA(fume) (5) TWA(dust) (10)	TWA(dust) (15) na

Aerosol Contents under pressure of 55+/-5 psi
*This CAS No. is subject to the reporting requirements of Section 313 of SARA Title III and of 40 CFR 372

SECTION 3 – PHYSICAL DATA - FIRE AND EXPLOSION DATA

Physical State: Liquid **Water Solubility:** Insignificant **Odor/Appearance:** Grey with Odor of aliphatic and aromatic hydrocarbons
Vapor Pressure: 50 @ 21°C **Vapor Density:** Heavier than Air **Evaporation Rate:** Faster than Ether
Boiling Range: 1-396 °F **Flash Point:** <20 °F TOC **Specific Gravity:** 1.20 @ 25 °C
Percent Volatile: 48 (wt) **Autoignition Temp:** Undetermined **Weight per Gallon:** 10.01 Lbs. @ 25 °C.
Reactivity in Water: See Sec.4 **Flammability Limits in Air:** UEL 12.8% (vol) LEL 1.1% (vol)
Flammability Classification:
DOT - Consumer Commodity – Hazard Class ORM-D / OSHA- Flammable Class IA, OSHA Class 29 (1910-1063)
Label: Extremely Flammable RSP. CFR 16-1500.3(6)(V)
VOC: Less than 30% by weight

Extinguishing Media: Approved Class B Fire Extinguisher, foam or dry chemical. DO NOT USE WATER! Combustion in a limited amount of air can generate toxic Carbon Monoxide. Use full protective equipment and self-contained breathing apparatus for respiratory protection in fighting fires in enclosures. In a fire situation or when the material is heated, it becomes a highly flammable liquid with a moderate explosion hazard. Once ignited, this product will burn readily in air.

Unusual Fire and Explosion Hazards: Keep containers closed tightly. Isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. Zinc present in a finely divided form is hazardous when atomized in air and, if sparked, explosion is possible. Application to hot surfaces requires special precautions. During emergency conditions, overexposure to decomposition products (gaseous oxides of Carbon and Nitrogen) may cause health hazard. Symptoms may not be immediately apparent. Obtain medical attention. Heavier than air vapors may flow along surfaces to distant ignition sources and flash back. Moisture and acid contamination can result in Hydrogen gas evolution, causing cans to bulge with increased pressure. Cans so deformed should not be moved, opened or punctured. Call (781) 319-0400. See also Sections 4 and 6.

Special Fire Fighting Procedures: DO NOT USE WATER IN ANY FORM.
Water may be used to cool containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat, but care should be taken to prevent water access to wet paint and spray residues. See also Section 7

SECTION 4 - PHYSICAL HAZARDS

Stability: Stable **Hazardous Polymerization:** Will not occur
Materials and Conditions to Avoid: This material is considered to be stable under its normal handling and storage conditions. It can react violently with strong oxidizing agents such as chlorine and oxygen, as well as water, weak acids and concentrated acids. Store in dry areas away from oxidizing agents (chlorine, oxygen), all acids, alkalies and water. Avoid dusting and accumulations of spray residues.
Hazardous Combustion Products: Thermal degradation, water and alkali contact may produce hydrogen gas accompanied with additional risks of explosion and fire. May produce fumes of zinc oxides and the oxides of carbon and nitrogen when heated to decomposition. Acid contact will produce hydrogen.
Sensitivity to Impact: Impact with sparking may produce discharge of contents with fire or explosion hazard.

SECTION 5 - HEALTH HAZARD DATA

Threshold Limit Value: 100 ppm **OSHA PEL:** Mixture (See Section 2)
Routes of Entry: Skin Contact, Skin Absorption, Eye Contact, Inhalation and Ingestion
Medical Conditions Generally Aggravated by Exposure: Respiratory conditions, dermatitis and other skin afflictions, conditions of the central nervous system.
Effects of Acute Exposure to Product: Propane is an asphyxiant. Solvents contained in this mixture are central nervous system depressants. Symptoms of overexposure include drowsiness, dizziness, headache, slurred speech, intoxication with euphoria and/or depression leading to stupor and unconsciousness. Nose, throat and lung irritation may occur from inhalation. Skin contact may cause defatting and dermatitis. Eye contact with the liquid causes tears, burning, irritation, conjunctivitis. Ingestion will cause poisoning and may be fatal; avoid aspiration if ingested. Do not induce vomiting. Lung contact may cause chemical pneumonitis. During welding and burning operations hazardous decomposition products may be evolved from the dried film, these may include but not be limited to Zinc Oxides as well as gaseous oxides of Carbon and Nitrogen. Excessive inhalation of these fumes may produce symptoms known as "Fume Fever" and "Zinc Shakes" among other effects. Consult Physician.

Effects of Chronic Overexposure to Product: Reports have associated repeated and prolonged overexposure to solvents with permanent damage to the brain and central nervous system. Note: Minor embryotoxic/fetotoxic effects have been reported in one unconfirmed study of methyl ethyl ketone as being observed in laboratory rats exposed to over 1000 ppm of the pure solvent for most of the gestation period by the inhalation route (5X OSHA PEL).

Irritancy of Product: Eye, Skin, Nose, Throat and Lung irritant **Sensitization to Product:** May cause allergic skin reaction.
Carcinogenicity: None **Teratogenicity:** None **Mutagenicity:** None **Reproductive Toxicity:** None
Synergistic Products: None known

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. Keep warm and quiet. Give artificial respiration if required. Get medical assistance.
Eyes: Wash eyes immediately with large amounts of water for at least 15 minutes. Take to physician for medical attention.
Skin: Wash contact area promptly with soap and water. Promptly remove paint-wet clothing. Consult physician if irritation persists.
Ingestion: Do not induce vomiting without medical advice. Contact a physician, emergency room or Poison Center immediately. Observe all rules of good hygiene during and after use. Wash thoroughly before smoking or eating.

SECTION 6 – SPECIAL PROTECTION INFORMATION

Personal Protective Equipment:
Gloves: Neoprene gloves and aprons should be used to prevent prolonged or repeated skin contact. Use protective creams when skin contact is likely.
Respirator: In outdoor or open areas, wear only properly fitted, NIOSH/MSHA approved respirators capable of filtering dust particulates during and after application unless air monitoring demonstrates vapor/mist levels are below acceptable limits. In areas of restricted ventilation, wear only properly fitted, NIOSH/MSHA approved respirators designed to remove a combination of organic vapors and dust particulates during and after application unless air monitoring demonstrates vapor/mist levels are below acceptable limits. In confined areas, use approved air line type respirators or hoods. Follow respirator manufacturer's directions for respirator use.
Eye: Safety goggles with unperforated side shields or face shield should be used where splashing into eyes is possible. An eye wash fountain should also be available in areas where splashing is possible. When large amounts of material are used, a safety shower should be available.
Footwear: Wear chemical resistant boots with steel toes.
Clothing: Wear neoprene apron over well fitting clothes. Loose fitting clothes should not be worn. Remove and wash or discard contaminated clothing.
Ventilation Engineering Controls: Work place areas require exhaust ventilation in accordance with OSHA regulation 29 CFR Part 1910.107d to maintain vapor levels below the TLV (especially during spraying, misting or heating). Use an approved high efficiency respirator of the full face canister type (for limited time and concentrations), air supplied type of self-contained respirators (for extended exposures involving high or unknown vapor concentrations or for non-routine or emergency conditions). Exhaust levels should be maintained at least at 100 l/m. All ventilation equipment should be explosion-proof, and any tools used in the area should be of the non-sparking type.

SECTION 7 - SPECIAL PRECAUTIONS - SPILL OR LEAK PROCEDURES

Leak and Spill Procedure: For massive spills, evacuate the area. For all spills, eliminate ignition sources. Dike and contain spills with dry, inert materials (sand, earth, etc.). Eliminate all sources of moisture and do not use water in clean-up operations. Recover as much of the free liquid as possible for disposal and use an absorbent to pick up the residue. Avoid discharging paint directly into a sewer or surface waters. Do not flush spills with water. Use non-sparking tools only. Spilled material may be slippery on floors.
Waste Disposal: Dispose of the absorbed material or the free waste liquid in dry containers according to Local, State and Federal regulations for Hazardous Wastes. Dispose of all materials including empty cans according to Local, State and Federal regulations. Do not incinerate. Do not flush into sewers. Containers may explode if heated even when empty. It is recommended that solid waste be landfilled only at approved hazardous disposal sites using approved contractors.
Handling Procedures and Equipment: Use only non-sparking tools. Areas of use should have good ventilation and all sources of open flame and high heat should be excluded. Prohibit smoking in these areas. Ensure sufficient ventilation to prevent accumulation of heavy vapors in low lying areas of sumps. Material is electrically conductive.
Storage Requirements: This extremely flammable liquid should be stored in a cool, clean, dry, well-ventilated, fire resistant storage room or in a solvent storage cabinet that meets OSHA requirements. Do not store in direct sunlight. Store only in cans with identifying labels that indicate the flammability of the material. Store large quantities only in buildings in compliance with OSHA 1910.105. Areas of storage for this material should have good ventilation and all sources of open flame and high heat should be excluded. Prohibit smoking in these areas. Ensure sufficient ventilation to prevent accumulation of heavy vapors in low lying areas or sumps. Do not store above 49 °C. Do not puncture, drag or slide container.
Other Precautions: Any deformed cans should not be moved, opened or punctured. Call (781) 319-0400. Do not take internally.
Keep away from children. Empty container may contain extremely flammable residues and explode if heated.

THIS PRODUCT IS A MIXTURE. MSDS FILES ON THE INDIVIDUAL COMPONENTS WERE USED TO DERIVE THE INFORMATION CONTAINED HEREIN.

MKL 096013

LA-CO Industries, Inc.

Markal CHINA MARKER White, Yellow, Red, Black, Blue, Green

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations, Canada Hazardous Products Regulations (HPR) / Règlement sur les produits dangereux (RPD)
SDS ID: LACO1512001
Issue date: 12/15/2015 Revision date: 4/3/2023 Supersedes: 12/15/2015 Version: 1.1

SECTION 1: Identification

1.1. Identification

Product form : Mixture
Product name : Markal CHINA MARKER White, Yellow, Red, Black, Blue, Green

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Marking.

1.3. Supplier

LA-CO Industries, Inc.
1201 Pratt Blvd.
Elk Grove Village, IL, 60007-5746
US
T 847-956-7600 - F 847-956-9885
customer_service@laco.com

1.4. Emergency telephone number

Emergency number : 24-hour emergency: CHEMTREC- U.S. : 1-800-424-9300 International: +1-703-527-3887;
全国应急中心 0532 8388 9090

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labeling

No labeling applicable

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS US classification
Carbon black	CAS-No.: 1333-86-4	0 – 10	Carc. 2, H351
Titanium dioxide	CAS-No.: 13463-67-7	0 – 10	Carc. 2, H351

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : No special measures required.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact : Gently wash with plenty of soap and water.

First-aid measures after eye contact : In case of contact, immediately flush eyes with plenty of water.

First-aid measures after ingestion : Call a POISON CENTER or doctor/physician if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects : None known.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : None known.

5.2. Specific hazards arising from the chemical

Fire hazard : No particular fire or explosion hazard.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Keep upwind.

Protection during firefighting : Wear a self contained breathing apparatus. Wear fire/flame resistant/retardant clothing. EN469.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : This product is not hazardous.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Contains no substances known to be hazardous to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain and collect as any solid.

6.4. Reference to other sections

Section 7: safe handling.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid contact with skin, eyes and clothing.

Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage area : Store in dry, cool, well-ventilated area.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Markal CHINA MARKER White, Yellow, Red, Black, Blue, Green	
No additional information available	

Carbon black (1333-86-4)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Carbon black
ACGIH OEL TWA	3 mg/m³ (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: Bronchitis. Notations: A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans)
Regulatory reference	ACGIH 2022
USA - OSHA - Occupational Exposure Limits	
Local name	Carbon black
OSHA PEL TWA [1]	3.5 mg/m³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL TWA	3.5 mg/m³
NIOSH REL STEL	0.1 mg/m³

Titanium dioxide (13463-67-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Titanium dioxide
ACGIH OEL TWA	10 mg/m³
Remark (ACGIH)	TLV® Basis: LRT irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2021

Titanium dioxide (13463-67-7)	
USA - OSHA - Occupational Exposure Limits	
Local name	Titanium dioxide (Total dust)
OSHA PEL TWA [1]	15 mg/m³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

8.2. Appropriate engineering controls

Appropriate engineering controls : None known.

8.3. Individual protection measures/Personal protective equipment

Hand protection:
None under normal use.
Eye protection:
None under normal use
Respiratory protection:
None under normal use

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: A solid crayon-like marker.
Color	: Variable
Odor	: odorless
Odor threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20°C	: No data available
Relative density	: No data available
Solubility	: insoluble in water.
Partition coefficient n-octanol/water (Log Pow)	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

VOC content : 0 %

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

Carbon black (1333-86-4)	
LD50 oral rat	> 8000 mg/kg
LD50 dermal rabbit	> 8000 mg/kg Source: ECHA

Titanium dioxide (13463-67-7)	
LD50 oral rat	> 5000 mg/kg
LC50 Inhalation - Rat	> 6.82 mg/l/4h

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified.

Carbon black (1333-86-4)	
IARC group	2B - Possibly carcinogenic to humans

Titanium dioxide (13463-67-7)	
NOAEL (chronic,oral,animal/male,2 years)	5 mg/kg body weight rat
IARC group	2B - Possibly carcinogenic to humans

Reproductive toxicity : Not classified
STOT-single exposure : Not classified
STOT-repeated exposure : Not classified

Carbon black (1333-86-4)	
NOAEL (oral,rat,90 days)	> 1000 mg/kg body weight Animal: rat, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)
NOAEC (inhalation,rat,dust/mist/fume,90 days)	0.0011 mg/l air Animal: rat, Animal sex: male

Aspiration hazard : Not classified

Viscosity, kinematic : No data available

Likely routes of exposure : Inhalation. Skin and eye contact.

Symptoms/effects : None known.

SECTION 12: Ecological information

12.1. Toxicity

Carbon black (1333-86-4)	
LC50 - Fish [1]	> 1000 mg/l Source: NITE
EC50 72h - Algae [1]	> 10000 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)
EC50 72h - Algae [2]	> 10000 mg/l Test organisms (species):
ErC50 algae	> 10000 mg/l Source: EHCA

12.2. Persistence and degradability

Carbon black (1333-86-4)	
Persistence and degradability	Not readily biodegradable.

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with DOT / IMDG / IATA

DOT	IMDG	IATA
14.1. UN number		
Not regulated for transport		

DOT	IMDG	IATA
14.2. Proper Shipping Name		
Not applicable	Not applicable	Not applicable
14.3. Transport hazard class(es)		
Not applicable	Not applicable	Not applicable
14.4. Packing group		
Not applicable	Not applicable	Not applicable
14.5. Environmental hazards		
Not applicable	Not applicable	Not applicable
No supplementary information available		

14.6. Special precautions for user

DOT
No data available

IMDG
No data available

IATA
No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Carbon black (1333-86-4)

Listed on the Canadian DSL (Domestic Substances List)

Titanium dioxide (13463-67-7)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Markal CHINA MARKER White, Yellow, Red, Black, Blue, Green
All components are listed on the EEC inventory European Inventory of Existing Commercial Chemical Substances (EINECS). All ingredients are listed in the Toxic Substances Control Act (TSCA). All ingredients are listed on the Canadian Domestic Substances List (DSL) or Non-Domestic Substances List (NDSL).

Carbon black (1333-86-4)
Listed on IARC (International Agency for Research on Cancer) Listed on INSQ (Mexican National Inventory of Chemical Substances)

Titanium dioxide (13463-67-7)
Listed on IARC (International Agency for Research on Cancer) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on Taiwan National Chemical Inventory Listed on the Japanese ENCS (Existing New Chemical Substances) inventory Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Markal CHINA MARKER White, Yellow, Red, Black, Blue, Green	
State or local regulations	The carbon black in this product is bound and is not respirable. California Prop. 65 warnings are not required.

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations, Canada Hazardous Products Regulations (HPR) / Règlement sur les produits dangereux (RPD)

Revision date : 4/3/2023

Other information : None.

Full text of H-phrases	
H351	Suspected of causing cancer

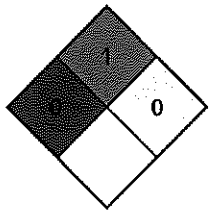
Abbreviations and acronyms	
	ATE: Acute Toxicity Estimate
	CAS (Chemical Abstracts Service) number
	CLP: Classification, Labelling, Packaging.
	EC50: Environmental Concentration associated with a response by 50% of the test population.
	GHS: Globally Harmonized System (of Classification and Labeling of Chemicals).
	LD50: Lethal Dose for 50% of the test population
	OSHA: Occupational Safety & Health Administration

Abbreviations and acronyms	
	PBT: Persistent, Bioaccumulative, Toxic
	TWA: Time Weighted Average
	TSCA: Toxic Substances Control Act

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 1 - Materials that must be preheated before ignition can occur.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Safety Data Sheet (SDS), USA

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

MKL 96817

SAFETY DATA SHEET

Section 1: Product and Company Identification

Product Name: Valve Action® Paint Marker – Brown, Purple, White, Yellow, Red, Black, Orange, Blue, Green, Gold, Light Green, Pink, Aluminum, Light Blue

Product Code: 96809 (brown), 96817 (purple), 96820 and 96800 (white), 96821 and 96801 (yellow), 96822 and 96802 (red), 96823 and 96803 (black), 96824 and 96807 (orange), 96825 and 96805 (blue), 96826 and 96806 (green), 96827 (gold), 96828 (light green), 96830 (pink), 96835 (light blue), 96832 and 96804 (aluminum)

Product Use: Marker for metal, wood, glass, plastic, rubber, cardboard and paper.

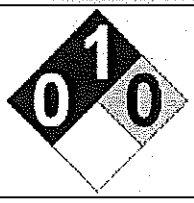
Manufacturer: LA-CO Industries, Inc.
1201 Pratt Boulevard
Elk Grove Village, IL.
60007-5746
E-mail Contact: customer_service@laco.com

Phone Number: (847) 956-7600

Fax: (847) 956-9885

24-hour Emergency: **CHEMTREC: (800) 424-9300**

Section 2: Hazards Identification

Protective Clothing	NFPA Rating (USA)	EC Classification	WHMIS (Canada)	Transportation
Not Required for Normal Use		Not Classified as Dangerous	Not Controlled	Not Regulated

Emergency Overview: The paint inside the marker contains components which are considered hazardous by inhalation of vapors and skin contact. Exposure to hazardous or dangerous substances is not expected when handling this product for its intended use.

Appearance, Color and Odor: Marker containing less than 10 mL of various colored paint. Organic solvent odor.

USA: This product is not a hazardous material as defined by 29 CFR1910.1200, OSHA Hazard Communication Evaluation. This product meets the definition of an "article".

Canada: This is not a controlled product under WHMIS. This product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

European Communities (EC): This product is not classified as dangerous according to Directive 1999/45/EC and its amendments. This product contains a small amount of a liquid preparation which contains dangerous ingredients however, there is no expected release of the liquid during use of the product and there is a barrier preventing exposure of the user and the environment.

SAFETY DATA SHEET

Section 2: Hazards Identification (continued)

Potential Health Effects: **ACUTE (short term): see Section 8 for exposure controls**

Relevant Route(s) of Exposure: Skin contact.

Inhalation: Exposure to hazardous substances by inhalation is not expected with normal use of the marker.

Ingestion: Not an expected route of occupational exposure. Acute oral toxicity of the component substances is low.

Skin: Normal use of marker will not result in harmful effects. Contact with the paint may be harmful to the skin; may be absorbed through the skin.

Eye: Not an expected route of occupational exposure. Liquid and vapors can irritate the eyes.

CHRONIC (long term): see Section 11 for additional toxicological data

Long-term health effects are not expected with normal use of the marker.

Prolonged or repeated contact with the skin may result in defatting and drying of skin and may result in dermatitis.

Medical Conditions Aggravated by Exposure: Preexisting skin disorders may be aggravated by repeated exposure to the liquid in the marker.

Interactions With Other Chemicals: Not available

Potential Environmental Effects: Not available

Section 3: Composition / Information on Ingredients

Hazardous/Dangerous Ingredients
For All Colors:

Chemical Name	CAS No.	Wt.%	EINECS / ELINCS	Symbol	Risk Phrases
Solvent naphtha (petroleum)	64742-88-7	15 - 25	265-191-7	Xn	R65
Stoddard Solvent	8052-41-3	5 - 15	232-489-3	T	Carc. Cat. 2 R45; R65
Ligroine (VM&P Naphtha)	8032-32-4	5 - 45	232-453-7	T	Carc. Cat. 2 R45; R65
Xylene	1330-20-7	1 – 10	215-535-7	Xn	R10; R20/21; R38
Ethylbenzene	100-41-4	1 – 5	202-849-4	F; Xn	R11; R20

Color-specific ingredients:

Chemical Name	CAS No.	Wt.%	EINECS / ELINCS	Symbol	Risk Phrases
Copper (Gold only)	7440-50-8	10 – 15	231-159-6*	None*	None*
2-methoxy-1-methylethyl acetate (Black and Light Green only)	108-65-6	1 – 5	203-603-9	Xi	R10; R36
Acetone	67-64-1	1 - 5	200-662-2	F; Xi	R11; R36-66-67
Aluminum (Aluminum only)	7429-90-5	5 - 10	231-072-3	F	R15
Carbon Black	1333-86-4	5 - 10	215-609-9*	None*	None*

* This chemical substance is not classified in the Annex I of Directive 67/548/EEC.

Note: See Section 8 of this SDS for exposure limit data for these ingredients.
See Section 16 for the full text of the R-phrases above.

SAFETY DATA SHEET

Section 4: First Aid Measures

Inhalation: If symptoms are experienced remove source of contamination or move victim to fresh air and obtain medical advice.

Eye Contact: No effects expected. If irritation occurs, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Skin Contact: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Ingestion: If irritation or discomfort occurs, obtain medical advice immediately.

Section 5: Fire Fighting Measures

Flammable Properties: Paint contained within the markers is flammable. Flashpoint = 23°C (73°F)

Suitable extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide, or alcohol-resistant foam. For large fires, use carbon dioxide, dry chemical powder, alcohol-resistant foam or polymer foam. Firefighting foams are the extinguishing agent of choice for most flammable liquid fires. Use water spray to cool fire-exposed containers.

Unsuitable extinguishing Media: Not available

Explosion Data:

Sensitivity to Mechanical Impact: Not applicable

Sensitivity to Static Discharge: Not applicable

Specific Hazards arising from the Chemical: Combustion may produce toxic and irritating fumes and gases.

Protective Equipment and precautions for firefighters: Self-contained breathing apparatus and protective clothing should be worn. Remove all unprotected personnel.

NFPA

Health: 0
Flammability: 1
Instability: 0

Section 6: Accidental Release Measures

Personal Precautions: No special requirements.
If large volumes of liquid paint are released, wear protective gloves, goggles and clothing. Monitor the workplace air for harmful concentrations of vapors and take appropriate precautions if concentrations in air exceed workplace exposure limits.

Environmental Precautions: Prevent the product from entering sewers or waterways.

Methods for Containment: No special methods required. If large volumes of liquid paint are released, stop the leak if it is safe to do so. Contain spilled paint with earth, sand, or absorbent material which does not react with spilled material.

Methods for Clean-up: Clean up spills immediately. Shut off or extinguish all sources of ignition. Immediately soak spilled material with water. Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labeled containers. Contaminated absorbent material may pose the same hazards as the spilled product. Dispose of any contaminated, unusable product as described in Section 13 of this Safety Data Sheet.

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Section 7: Handling and Storage

Handling: Avoid contact with skin and eyes. Do not use near sources of extreme heat. Keep out of reach of children.

Storage: Store in a cool, dry area, out of direct sunlight and away from heat, flames and ignition sources. Keep markers closed when not in use.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines

Consult local authorities for acceptable exposure limits.

Measurable airborne concentrations of the component substances, listed in Section 3, are not expected when the markers are used for their intended purpose.

Exposure Controls

Engineering Controls: Not required for normal use.

Personal Protection:

Eye/Face Protection: Not required for normal use.

Skin Protection: Not required for normal use.

Respiratory Protection: Not required for normal use

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements, European Standard EN529 or Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

General Hygiene Measures: Do not ingest. Avoid contact with skin and eyes. Keep out of reach of children. Wash hands after handling.

Section 9: Physical and Chemical Properties

Physical State:	Solid	**Flash Point & method:**	23°C (73°F) for liquid paint
Appearance, Color and Odor:	Cylindrical marker; brown, purple, white, yellow, red, black, orange, blue, green, gold, light green, pink, light blue; odor of organic solvent.	**Autoignition Temperature:**	Not available
Odor Threshold:	Not available	**Flammability Limits in Air:**	Not available
pH:	Not applicable	**Vapor Pressure:**	Not applicable
Specific Gravity:	Not applicable	**Vapor Density:**	Not applicable
Partition coefficient:	Not available	**Evaporation Rate:**	Not applicable
Solubility:	Not applicable	**Boiling Point/Range:**	Not available
Viscosity:	Not applicable	**Melting Point:**	Not available
Decomposition Temperature:	Not available	**VOC Content:**	47 – 72% (w/w) for liquid paint

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Section 10: Stability and Reactivity

Chemical Stability: Stable at normal room temperature.

Conditions to Avoid: Avoid extreme heat and open flames.

Incompatible Materials: Incompatible with strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Section 11: Toxicological Information

Acute Toxicity Data

Acute toxicity data is not available for the liquid paint preparations inside the markers. The paint contains substances which are considered toxic and harmful by inhalation and in contact with skin however, there is no expected release of the liquid during the intended use of the marker and there is a barrier preventing exposure of the user and the environment.

Chronic Toxicity Data

Carcinogenicity: The components Stoddard solvent, Ligroine (VM&P Naphtha) are listed in the EU as R45, may cause cancer. Ethylbenzene is listed by IARC* in Group 2B, possibly carcinogenic to humans, and by ACGIH* as A3, confirmed animal carcinogen with unknown relevance to humans. Normal use of the markers is not expected to pose the risk of exposure to these substances.

* IARC: (International Agency for Research on Cancer) ACGIH: (American Conference of Governmental Industrial Hygienists)

Irritation: Normal use of marker will not result in harmful effects. High concentrations of vapors may cause irritation to the eyes.

Corrosivity: Not applicable

Sensitization: Not applicable

Neurological Effects: Not applicable with normal use of the marker.

Genetic Effects: Not applicable with normal use of the marker.

Reproductive Effects: Not applicable with normal use of the marker.

Developmental Effects: Not applicable with normal use of the marker.

Target Organ Effects: Not applicable with normal use of the marker.

Section 12: Ecological Information

Ecotoxicity: Not available

Persistence/Degradability: Not available

Bioaccumulation/Accumulation: Not available

Mobility: Not available

Other adverse effects: Not available

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Section 13: Disposal Considerations

Waste Disposal Method: Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.
The conditions of use, storage and disposal of this product are beyond our control and may be beyond our knowledge. For this and other reasons, LA-CO Industries, Inc. does not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

USA: Dispose of in accordance with local, state and federal laws and regulations.

Canada: Dispose of in accordance with local, provincial and federal laws and regulations.

EC: Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Section 14: Transport Information:

U.S. Hazardous Materials Regulation (DOT 49CFR): Not regulated, this product conforms to small quantity exception of DOT 49CFR173.4.

Canadian Transportation of Dangerous Goods (TDG): Not regulated

ADR/RID: Not regulated

IMDG: Not regulated

Marine Pollutants: Not applicable

ICAO/IATA: Not regulated

Section 15: Regulatory Information

USA

TSCA Status: All component substances are listed on the TSCA inventory.

SARA Title III
Sec. 302/304: None
Sec: 311/312: Not applicable
Sec. 313: Xylenes, Ethylbenzene, Copper, Aluminum
CERCLA RQ: Not applicable

California Prop 65: This product contains the following chemicals known to the State of California to cause cancer: Ethylbenzene

State Right-to-Know Lists : State right to know lists:
Mineral spirits (NJ)
Stoddard Solvent (MA, NJ, PA)
VM&P Naphtha (NJ, PA)
Xylene (MA, NJ, PA)
Ethylbenzene (MA, NJ, PA)
Copper (MA, NJ, PA
Acetone (MA, NJ, PA)
Aluminum (MA, NJ, PA)
Carbon black (MA, NJ, PA)

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Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: (for workplace exposures)

Not controlled. Product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

New Substance Notification Regulations:

All component substances are listed on Canada's Domestic Substances List (DSL).

NPRI Substances:

Xylene, VM&P Naphtha, Ethylbenzene, Copper, Solvent naphtha, Stoddard solvent, Ethylbenzene, Copper, Propylene glycol methyl ether acetate (108-65-6), Aluminum.

EC Classification for the Substance/Preparation

European Inventories:

All component substances are listed in EINECS.

Symbol:

This product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Section 16: Other Information

Full Text of R-phrases appearing in Section 2:

R10: Flammable
R11: Highly flammable
R15: Contact with water liberates and extremely flammable gas.
R20: Harmful by inhalation
R20/21: Harmful by inhalation and in contact with skin
R36: Irritating to eyes
R38: Irritating to skin
R45: May cause cancer
R65: May cause lung damage if swallowed
R66: Repeated exposure may cause skin dryness and cracking.
R67: Vapours may cause drowsiness and dizziness.

Preparation Information:

Prepared by:

LEHDER Environmental Services Limited (519) 336-4101
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Revision Summary:

November 1, 2005 revised first page header, sections 3, 4, 11, 14 and 15.
July 31, 2008 revised SDS template, revised formulation in Section 3.

Disclaimer:

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