

Solubilité: Miscible en toutes proportions dans l'eau.
Volatilité en % par volume: Aucune donnée
pH: 11,5 - 13,0
Coefficient de répartition eau/huile: Aucune donnée
Sensibilité aux chocs: Aucune donnée
Taux de combustion: Aucune donnée
Puissance explosive: Aucune donnée
Sensibilité aux décharges électrostatiques: Aucune donnée

REACTIVITÉ:

Stabilité:

Dans des conditions normales: Instable au-delà de 40°C, exposé au soleil, ou au contact de métaux.

En présence de flammes: Instable

Risques de polymérisation brutale: Nuls

Conditions à éviter: Températures supérieures à 40°C

Substances incompatibles: Les acides forts, l'ammoniaque, les matières oxydables, l'urée, le nickel, le cuivre, le manganèse, le fer et la plupart des métaux.

Produits de décomposition ou de combustion dangereux:

Du chlore gazeux si en contact avec des acides ; de l'oxygène au contact des métaux.

DESCRIPTION RÉGLEMENTAIRE: (Selon la loi sur le TMD)

Appellation réglementaire: Hypochlorite en solution
Classification: Matière corrosive, classe 8 (9.2)
Numéro d'identification du produit (NIP): UN 1791
Groupe d'emballage: III

RISQUES D'INCENDIE ET D'EXPLOSION:

Point d'éclair (méthode): Ininflammable

Température d'auto-ignition: Sans objet

Limites d'explosivité dans l'air (%): lim. sup.: sans objet
lim. inf.: sans objet

Agents d'extinction: Utiliser le moyen d'extinction approprié pour les objets environnants

Techniques de lutte contre l'incendie:

Porter une tenue de protection complète, y compris un respirateur autonome.
Retirer les contenants de stockage de la zone d'incendie si possible. Les arroser avec un jet d'eau pour les refroidir afin d'éviter une augmentation de pression.

TOXICOLOGIE ET RISQUES POUR LA SANTÉ:

Limites d'exposition recommandées: TLV DE L'ACGIH : 0,5 ppm (comme pour le chlore).

Données toxicologiques:

Hypochlorite de sodium: DL 50 (oral, rat) : 8,910 mg/kg.
CL50 (inhalation, rat) > 10500 mg/m³/H

Carcinogène: Les éléments constitutifs de ce produit ne sont pas inscrits comme cancérogènes.

Reproduction: Aucune information n'est disponible.

Mutagenèse: Aucune information n'est disponible.

Teratogénèse: Aucune information n'est disponible.

Substances synergiques: Aucune substance connue.

Effets en cas d'exposition par:

Inhalation: *Corrosif I peut entraîner une irritation du nez et des voies respiratoires supérieures, des maux de tête et de la toux.

Contact cutané: *Corrosif I Risque d'irritation grave localisée, de brûlures et de lésions. Le contact prolongé ou répété avec des solutions diluées peut décolorer la peau ou provoquer une dermatite.

Contact oculaire: *Très corrosif I Risque d'irritation et de lésions graves pouvant entraîner la cécité.

Ingestion: *Corrosif I Risque de brûlures de la bouche et de la gorge. Douleurs vives, vomissements.

PREMIERS SOINS: Attention CORROSIF I

Inhalation: Amener la victime à l'air libre et rester auprès d'elle. Obtenir d'urgence des soins médicaux.

Contact cutané: Retirer les vêtements contaminés. Rincer les régions atteintes à l'eau courante pendant au moins 20 minutes. Obtenir d'URGENCE des soins médicaux.

Contact oculaire: Rincer immédiatement à l'eau courante pendant au moins 30 minutes en maintenant les paupières ouvertes. Obtenir des soins médicaux immédiatement.

Ingestion: Si la victime est consciente et qu'elle n'est pas en état convulsif, lui faire rincer la bouche et boire de un demi à un verre d'eau pour diluer le produit. NE PAS faire vomir. Obtenir des soins médicaux immédiatement.

MESURES PREVENTIVES:

Vérifications techniques: Il est recommandé d'installer des ventilateurs d'évacuation locaux.

Protection respiratoire: Respirateur anti-chlore homologué par le NIOSH/MSHA muni de cartouches lorsque nécessaire.

Protection de la peau: Utiliser des gants en caoutchouc, un tablier et des bottes en caoutchouc si nécessaire.

Protection des yeux: Risque d'atteinte des yeux: lunettes monoocques
antiacides.

Autre matériel protecteur: Douche d'urgence et fontaine oculaire dans les locaux
de stockage et de manutention.

Techniques de manutention et matériel: Protéger les contenants contre les
dommages physiques.

Température de stockage (en ° C): Moins de 29° C et au-dessus du point
de congélation.

Conditions de stockage: Garder dans un endroit frais (à moins de 29° C),
sec, bien ventilé, loin des substances incompatibles
et à l'abri de la lumière directe du soleil.

Précautions supplémentaires: Aucune exigence particulière.

PROTECTION DE L'ENVIRONNEMENT:

Consignes en cas de fuite ou de déversement:

Ventiler le secteur. Arrêter et contenir la fuite ou le
déversement. Absorber à l'aide d'une matière inerte
(sable, cendres, etc.), recueillir et éliminer. Pour
récupérer, pomper dans des contenants en polyéthylène.

Méthode d'élimination: Consulter les réglementations municipales, provinciales et
fédérales en vigueur sur l'élimination des produits
chimiques.

RÉFÉRENCES:

SAX, N.I., Dangerous Properties of Industrial Materials.
Fiches signalétiques du fournisseur.

RÉDACTION:

GRUPE LAVO (LABORATOIRE)

**SODIUM HYPOCHLORITE
SOLUTION 12%**

**HYPOCHLORITE DE SODIUM³⁰
EN SOLUTION 12%⁹**

DANGER! CORROSIVE!
Causes severe burns to eyes and skin. Harmful if inhaled or swallowed.



DANGER! CORROSIFI
Provoque de graves brûlures à la peau et aux yeux. Nocif si inhalé ou ingéré.

Precautions: Wear proper protective equipment. Avoid skin and eye contact. Avoid breathing vapour. Store away from heat sources. Keep away from acids and incompatible substances.

Mise en garde: Porter la tenue de protection appropriée. Éviter tout contact avec la peau ou les yeux. Éviter d'inhaler. Entreposer dans un endroit frais. Éviter tout contact du produit avec des acides ou autres matières incompatibles.

First Aid: If inhaled, remove victim to fresh air. If breathing stopped, begin artificial respiration. Call physician.

Premiers soins: En cas d'inhalation, transporter la victime à l'air frais. En cas d'arrêt respiratoire, pratiquer la respiration artificielle. Appeler un médecin.

For skin or eye contact, flush with water for at least 20 minutes while removing contaminated clothing. Obtain medical attention.

En cas de contact avec la peau ou les yeux, laver à grande eau pendant 20 minutes au moins tout en retirant les vêtements souillés. Obtenir des soins médicaux.

If ingested, do not induce vomiting. Have victim drink 1 glass of water. Never give anything by mouth if victim is unconscious. Obtain medical attention immediately.

En cas d'ingestion, ne pas faire vomir. Faire boire 1 verre d'eau à la victime. Ne rien faire avaler à la victime si elle est inconsciente. Obtenir des soins médicaux immédiatement.

Lavo Ltée - 1880 rue Chambly
Montréal, Québec - H1W 3G2

SUPER-F INC.
 7260 Honoré-Vaillancourt
 Montréal, QC Canada H1E 2S2

TEL.: (514) 648-1285 FAX: (514) 648-8962

FICHE SIGNALÉTIQUE

RENSEIGNEMENTS SUR LA PRÉPARATION

NOM DE LA PERSONNE RESPONSABLE
 NUMÉRO DE TÉLÉPHONE
 ÉCHÉANCE LE

CAROLINE ARSENAULT
 (514) 648-1285
 1^{er} Mai 2005

IDENTIFICATION DU PRODUIT

ATOM-X (Neutralisant d'odeurs) *(pour odeur porcherie)*

CENTRE CANADIEN D'URGENCE TRANSPORT

CANUTEC (613) 996-6666 (Canada)

TÉLÉPHONE A FRAIS VIRES

CHEMTREC 1-800-424-9300 (États-Unis)

INGRÉDIENTS DANGEREUX

INGRÉDIENTS	%	UN	CAS	TLV PPM	DL50 Mg/Kg	CL50 Mg/m ³
COMPOSÉ D'EXTRAITS NATURELS & PRODIGES DE SYSTÈME	60-80	--	-----	---	-----	-----
SURFACTANT	10-15	--	-----	---	-----	-----
GLYBÉRALDÉHYDE	1-2	--	112-30-0	---	733	400
Alcoolisopropylique	1-10	--	67-63-0	400		

La divulgation des produits chimiques de cette solution est considérée par SUPER-F INC. comme étant secrète, selon les provisions 1910.1200 du Titre 29 du code des règlements fédéraux.

Les données sur les composants sont définies conformément au sous-alinéa 13a), (1) à (iv) ou à l'alinéa 14a) de la loi sur les produits dangereux.

CLASSIFICATION POUR TRANSPORT

Combustible

CARACTÉRISTIQUES PHYSIQUES

ÉTAT PHYSIQUE	liquide
ODEUR ET APPARENCE	forte odeur fruitée; incolore, clair
SEUIL DE L'ODEUR (ppm)	---
TENSION DE LA VAPEUR (mmHg 20°C)	>1
Taux d'évaporation (acétate de butyle = 1)	>1
PH	5,2
DENSITÉ	0,922
DENSITÉ DE LA VAPEUR (air = 1)	>1
POINT D'ÉBULLITION °C	>100
POINT DE CONGÉLATION °C	ne gèle pas
Coefficient de répartition eau/huile	soluble dans l'eau

RISQUE D'INCENDIE OU D'EXPLOSION

CONDITIONS D'INFLAMMABILITÉ	éviter les très hautes températures
MÉCANISME D'EXCITATION	dioxyde de carbone; mousse; eau pulvérisée; poudre sèche
POINT D'ÉCLAIR (méthode vase fermé)	85°C
SEUIL MINIMAL D'INFLAMMABILITÉ %/volume	n/d
SEUIL MINIMAL D'INFLAMMABILITÉ %/volume	n/d
TEMPÉRATURE D'AUTO-INFLAMMATION °C	n/d
PRODUITS DE COMBUSTION DANGEREUX	anhydride carbonique, oxyde de carbone
EXPLOSIBILITÉ AUX CHOC	non
EXPLOSIBILITÉ AUX DÉCHARGES ÉLECTRO-STATIQUES	non

REACTIVITE

CONDITIONS D'INSTABILITE
SUBSTANCES AVEC LESQUELLES LE PRODUIT EST INCOMPATIBLE
CONDITIONS DE REACTIVITE
PRODUITS DE DECOMPOSITION DANGEREUX

aucune
agents oxydants concentrés
aucune
sans objet

PROPRIETES TOXICOLOGIQUES

1- EFFETS DE L'EXPOSITION AIGUE AU PRODUIT
2- CONTACT AVEC LA PEAU
3- ABSORPTION PAR LA PEAU
4- CONTACT OCULAIRE
5- INHALATION
6- INGESTION
7- EFFETS DE L'EXPOSITION CHRONIQUE AU PRODUIT
8- LIMITE D'EXPOSITION (ppm)
9- PROPRIETE IRRITANTE
10- SENSIBILITE AU PRODUIT
11- CANCEROGENICITE
12- EFFET TOXIQUE SUR LA REPRODUCTION
13- TERATOGENICITE
14- MUTAGENICITE
15- UNE SUBSTANCE TOXICOLOGIQUEMENT SIMILAIRES

1- peut irriter les yeux, la peau, le corps,
2- peut causer de l'irritation
3- peut causer des allergies
4- peut causer de l'irritation
5- peut causer des maux de tête
6- peut être dangereux
7- exposition excessive irriter les yeux et causer des maux de tête
8- -----
9- peu
10- oui
11- aucune étude positive à ce jour
12- aucune étude positive à ce jour
13- aucune étude positive à ce jour
14- aucune étude positive à ce jour
15- inconnu

MATERIEL PERSONNEL A UTILISER

protection respiratoire: aucune normalement requise. Si on le désire, porter un respirateur approuvé par NIOSH; au besoin, un système de ventilation par évacuation locale conforme aux normes de l'ACSH; au besoin, porter des gants résistant aux produits chimiques pour éviter tout contact prolongé ou répété; porter des lunettes anti-éclaboussures ou un écran facial s'il y a risque de contact oculaire avertir les autorités locales; absorber avec des matières absorbantes avertir les autorités locales; placer le matériel et les matières absorbantes dans un contenant hermétiquement fermé éviter l'inhalation et le contact avec les yeux et la peau; bien se laver avant les repas et à la fin du quart de travail; fontaine ou douche pour les yeux dans le milieu de travail un endroit frais et bien ventilé; garder les contenants bien fermés aucun

MESURES A PRENDRE EN CAS DE FUITE OU DE DEVERSEMENT

ELIMINATION DES RESIDUS

METHODES ET EQUIPEMENTS POUR LA MANUTENTION

EXIGENCES EN MATIERE D'EMBALLAGE

REQUISITUMS SPECIAUX EN MATIERE D'EXPEDITION

PREMIERS SOINS

YEUX rincer abondamment les yeux à l'eau
PEAU laver à l'eau et au savon
INHALATION sortir la personne à l'air frais
INGESTION donner de l'eau pour diluer et appeler immédiatement un médecin
CAS D'URGENCE LE CENTRE ANTI-POISON DU QUEBEC AU 1-800-463-5060

RENSEIGNEMENTS ECOLOGIQUES

Manipuler selon le règlement sur la protection de l'environnement local.

tous les produits sont inscrits sur la liste des substances à usage domestique (DSL)

Les renseignements contenus dans le présent document ne sont donnés qu'à titre de guide sur la manipulation du produit et ont été rédigés en toute bonne foi par un personnel technique compétent. Ces renseignements ne sauraient être considérés comme complets, les méthodes et les conditions d'emploi et de manipulation pouvant s'étendre à d'autres aspects. Ne pouvant en aucun cas être tenu responsable de dommages, pertes, blessures corporelles ou dommages matériels pouvant résulter de l'utilisation de la présente information, aucune garantie, quelle qu'elle soit, expresse ou tacite, n'est accordée par SUPER-F INC. La présente fiche signalétique est valable pour trois (3) ans.

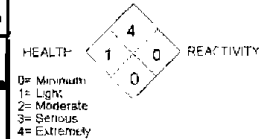


WALTER

J. Walter Company Ltd.
 5977 Trans Canada Hwy. Pointe Claire, Que H9K 1C1
 www.walter.com
 EMERGENCY PHONE: CANUTEC (613) 996-0666

HMIS RATING (According to NFPA code)

FLAMMABILITY



MATERIAL SAFETY DATA SHEET

M.S.D.S. No.: L-10E

SECTION 1 & 2 - Product & Preparation Information

TRADE NAME(S) Spatter Block	PRODUCT NAME(S) Weld Spatter Release
	ORDER NO. 53-P 002
PREPARED BY Product Manager, Cleaners & Lubricants	WHMIS CLASSIFICATION B5
TELEPHONE #(514) 630-2800 DATE January 6, 2004	THIS IS A CONTROLLED PRODUCT UNDER WHMIS No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

SECTION 3 - Hazardous Ingredients

CHEMICAL IDENTITY	% BY WEIGHT	C.A.S. Number	LD ₅₀ RAT	LC ₅₀ RAT
Dimethylether (propellant)	20-40	115-10-6	N/Av	N/Av

SECTION 4 - Physical Data

PHYSICAL STATE Aerosol	ODOUR & APPEARANCE Odourless, green	ODOUR THRESHOLD N/Av
pH 7.5	BOILING POINT (°C) N/A	FREEZING POINT (°C) N/A
SPECIFIC GRAVITY 0.84 g/ml @ 20°C	VAPOUR PRESSURE (@20°C) 6600 hPa	VAPOUR DENSITY N/Av
EVAPORATION RATE Slow		SOLUBILITY IN WATER Miscible

SECTION 5 - Fire or Explosion Hazards

FLAMMABILITY No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Conditions Source of ignition	HAZARDOUS COMBUSTION PRODUCTS Incubation emits toxic fumes of carbon dioxide and carbon monoxide...
EXTINGUISHING MEDIA CO ₂ , dry powder, foam	SENSITIVITY TO MECH. IMPACT OR STATIC DISCHARGE No
FLASHPOINT (°C, Method) -41 c.c. (propellant)	AUTO IGNITION TEMPERATURE (°C) 350 (propellant) FLAMMABLE LIMITS (%) (propellant) UPPER 32 LOWER 1.4

SECTION 6 - Toxicological Data

ROUTE OF ENTRY <input checked="" type="checkbox"/> Skin Contact <input type="checkbox"/> Skin Absorption <input checked="" type="checkbox"/> Eye Contact <input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Ingestion	
ACUTE EXPOSURE EFFECTS Inhalation may cause drowsiness.	EXPOSURE LIMITS (MAX)
CHRONIC EXPOSURE EFFECTS Prolonged contact may cause skin and eye irritation.	
CARCINOGENICITY No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>	MUTAGENICITY No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
REPRODUCTIVE TOXICITY No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>	TERATOGENICITY No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	SYNERGISTIC EFFECTS No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
IF YES TO ANY ABOVE, SPECIFY: No	

SECTION 7 - Reactivity Data

CHEMICAL STABILITY No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Conditions None	REACTIVITY CONDITIONS None
INCOMPATIBLE SUBSTANCES Oxidizing agents	HAZARDOUS DECOMPOSITION PRODUCTS Incubation emits toxic fumes of carbon dioxide and carbon monoxide

SECTION 8 - Preventive Measures

PROTECTIVE EQUIPMENT Eyewear <input checked="" type="checkbox"/> Clothing <input type="checkbox"/> Gloves <input checked="" type="checkbox"/> Other <input type="checkbox"/>	ENGINEERING CONTROLS Provide adequate ventilation.
HANDLING PROCEDURES Follow package instructions.	HANDLING EQUIPMENT None
WASTE DISPOSAL METHODS According to government regulations.	LEAK/SPILL PROCEDURES Wipe up with an absorbent material
STORAGE REQUIREMENTS Store at temperatures below 50°C.	SPECIAL SHIPPING INFORMATION U.N.1950, Class 2.1, P.G. III

SECTION 9 - First Aid Measures

SKIN CONTACT	Rinse thoroughly with plenty of water until substance is off skin.
EYE CONTACT	Rinse thoroughly with plenty of water. Seek medical attention if necessary.
INHALATION	Remove victim to fresh air. Do not give stimulative products. Seek medical attention if necessary.
INGESTION	Do not induce vomiting. Do not give stimulative products. Seek medical attention if necessary.
OTHER	N/A

N/A - Not Applicable

N/Av - Not Available

This data is offered in good faith as typical values and not as a product specification. No warranty, either express or implied is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.



STAINLESS STEEL

MSDS NO: STAINLESS ELECTRODES
& CAST IRON ELECTRODES
REVISED: 07/14/2005
CHANGE NUMBER: SE2455

MATERIAL SAFETY DATA SHEET

For U.S. Manufactured or Distributed Welding Consumables and Related Products.
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and Superfund Amendments and Reauthorization Act (SARA) of 1986
Public Law 99-499. Standard must be consulted for specific requirements

SECTION 1 - IDENTIFICATION

Manufacturer/Supplier Name:	HOBART BROTHERS	Telephone No:	(937) 332-4000
Address:	400 TRADE SQUARE EAST, TROY, OH 45373	Emergency No:	(800) 424-9300
Trade Name:	AWS WELDING ELECTRODE CLASSIFICATIONS		
	Group A: E308/308H-15,16,17; E308L-15,16,17; E309-15,16,17; E309L-15,16,17; E307-15; E309Cb-16; E309Mo-15,16; E309MoL-16; E310-15,16; E310H-15,16; E310Cb-16; E310Mo-16; E312-16; E316/316H-15,16,17; E316L-15,16,17; E317L-15,16,17; E318-16; E320-15,16; E320CR-15; E330-15,16; E347-15,16,17; E410-16; E410NiMo-16; E630-16; E2209-16; E2553		
	Group B: ENI-C1; ENiFe-C1		
Product Type for:	Group A: STAINLESS STEEL ARC WELDING ELECTRODES	Classification:	A5.4
	Group B: CAST IRON ARC WELDING ELECTRODES	Classification:	A5.15

SECTION 2 - HAZARDOUS INGREDIENTS
IMPORTANT

This section covers the hazardous ingredients from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are also addressed in Section 5. The term "hazardous" in this section should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

HAZARDOUS INGREDIENTS	GROUP	% WEIGHT		CAS NO.	EXPOSURE LIMIT (mg/m ³)	
		A	B		OSHA PEL	ACGIH TLV
IRON+		20-70	2-50	7439-89-6	5 R*	3R*
#CHROMIUM		10-25	---	7440-47-3	10 (Oxide Fume) 1 (Metal) 0.5 (Cr II & Cr III Compounds) 0.1 CL** (Cr VI Compounds)	5 (Oxide Fume) {A4} 0.5 (Metal) {A4} 0.5 (Cr III Compounds) {A4} 0.05 (Cr VI Soluble Compounds) {A1}
#NICKEL		0-30	25-80	7440-02-0	1 (Metal) 1 (Soluble Compounds) 1 (Insoluble Compounds)	1.5 (Metal) {A5} 0.1 (Soluble Compounds) {A4} 0.2 (Insoluble Compounds) {A1}
CALCIUM CARBONATE		2-10	1-6	1317-65-3	5 R*	10
FLUORSPAR		1-10	1-5	7789-75-5	5 (as CaO) 2.5 (as F)	2 (as CaO) 2.5 (as F) {A4}
#MANGANESE		1-10	<2	7439-96-5	5 CL** (Dust) 1, 3 STEL*** (Fume)	0.2 ♦♦ (Dust & Fume)
SILICA++ (Amorphous Silica Fume)		1-10	1-10	14808-60-7 69012-64-2	0.1 R* 0.8	0.1 R* 2 R*
TITANIUM DIOXIDE		1-13	---	13463-67-7	5 R*	10 {A4}
SILICON		1-10	1-10		7440-21-3	5 R* 10
##ALUMINUM OXIDE		0-3	---	1344-28-1	5 R*	10 {A4}
MOLYBDENUM		0-4	---	7439-98-7	5 R*	0.5 R* (Soluble Compounds) {A3} ♦ 10 I* (Elemental/Metal and Insoluble) 3 R* (Elemental/Metal and Insoluble)
#COPPER		0-4	<2	7440-50-8	1 (Dust) 0.1 (Fume)	1 (Dust) 0.2 (Fume)
COLUMBIUM+		0-2	---		7440-03-1	5 R* 3 R*
TUNGSTEN		0-4	---		7440-33-7	1, 3 STEL*** 1, 3
STEL***						
SILICATE BINDERS		1-10	1-10	-----	Not Established	Not Established
ZIRCONIUM		0-2	0-2	7440-67-7	5, 10 STEL*** (Zr & Compounds)	5, 10 STEL*** (Zr & Compounds) {A4}
MICA		0-6	---		12001-26-2	3 R* 3 R*
STRONTIUM CARBONATE+		---	0-25	1633-05-2	5 R*	3 R*
###ALUMINUM		---	<5	7429-90-5	5 R*	10
MAGNESIUM+		---	<1	7439-95-4	5 (Fume) 5 R*	5 (Fume) 3 R*
#ANTIMONY TRIOXIDE		---	<1	1309-64-4	5 R* (Oxide Fume) 0.5 (as Sb)	10 (Oxide Fume) 0.5 (as Sb) {A2}
#BARIUM CARBONATE		---	0-15	513-77-9	0.5 (as Ba)	0.5 (as Ba) {A4}

R* - Respirable Fraction. I* - Inhalable Fraction. ** - Ceiling Limit. *** - Short Term Exposure Limit
 {A1} - Confirmed Human Carcinogen per ACGIH. {A2} - Suspected Human Carcinogen per ACGIH. {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH. {A4} - Not Classifiable as a Human Carcinogen per ACGIH. {A5} - Not Suspected as a Human Carcinogen per ACGIH
 + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH.
 ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form.
 # - Reportable material under Section 313 of SARA. ## - Reportable material under Section 313 of SARA only in fibrous form.
 ### - Reportable material under Section 313 of SARA only in fume or dust form.
 ♦ - 2002 ACGIH listed under Notice of Intended Changes. A2 - "Suspected Human Carcinogen".
 ♦♦ - 2002 ACGIH listed under Notice of Intended Changes. Limits of 0.03 mg/m3 (respirable fraction) are proposed and should be considered as trial limits.

The exposure limit for welding fume has been established at 5 mg/m³ with OSHA's PEL and ACGIH's TLV. The individual complex compounds within the fume may have lower exposure limits than the general welding fume PEL/TLV. An Industrial Hygienist, the OSHA Permissible Exposure Limits For Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits.

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Welding consumables applicable to this sheet as shipped are solid and nonvolatile as shipped

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and flammable products. See American National Standard Z49.1 referenced in Section 7.

SECTION 5 - REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. **Most fume ingredients are present as complex oxides and compounds and not as pure metals.**

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products from normal use include those originating from the volatilization, reaction or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: Primarily - iron oxides for Group A and nickel oxides for Group B. Secondarily - complex oxides of manganese, chromium, copper, nickel for Group A, calcium, silicon, and titanium for Group A as well as fluorides. Some products will also contain antimony, barium, molybdenum, aluminum, columbium, magnesium, strontium, tungsten, and/or zirconium.

Monitor for the materials identified in Section 2. **Fumes from the use of these products may contain antimony, barium, manganese, chromium, nickel, fluorides, calcium oxides, amorphous silica fume, copper, and tungsten whose exposure limits are lower than the 5 mg/m³ PEL/TLV for general welding fume.**

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society", P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide", which gives additional advice on sampling.]

STAINLESS STEEL

SECTION 6 - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

Electric arc welding may create one or more of the following health hazards:

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can kill! See Section 7.

FUMES AND GASES can be dangerous to your health.

PRIMARY ROUTES OF ENTRY are the respiratory system, eyes and/or skin.

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS:

WELDING FUMES - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.

IRON, IRON OXIDE - None are known. Treat as nuisance dust or fume.

CALCIUM OXIDE - Dust or fumes may cause irritation of the respiratory system, skin and eyes.

FLUORIDES - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis.

SILICA (AMORPHOUS) - Dust and fumes may cause irritation of the respiratory system, skin and eyes.

TITANIUM DIOXIDE - Irritation of respiratory system.

MANGANESE - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure.

CHROMIUM - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people.

NICKEL, NICKEL COMPOUNDS - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction.

COPPER - Metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure.

MOLYBDENUM - Irritation of the eyes, nose and throat.

ALUMINUM, ALUMINUM OXIDE - Irritation of the respiratory system.

COLUMBIUM - Dust or fumes may cause irritation of the respiratory system, skin and eyes due to mechanical effects.

TUNGSTEN - Dust may cause irritation of the skin and eyes. Inhalation of dust may cause acute airways obstructive asthma which is reversible following overexposure. Symptoms are tightening chest and productive cough.

ZIRCONIUM - May cause irritation of the eyes, nose and throat due to mechanical effects.

STRONTIUM COMPOUNDS - Strontium salts are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea.

MAGNESIUM, MAGNESIUM OXIDE - Overexposure to the oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following exposure.

ANTIMONY COMPOUNDS - Irritation of nose, throat, eyes and skin.

BARIUM COMPOUNDS - Aching eyes, rhinitis, frontal headache, wheezing, laryngeal spasms, salivation or anorexia.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS:

WELDING FUMES - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis."

IRON, IRON OXIDE FUMES - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe₃O₄) are not regarded as fibrogenic materials.

CALCIUM OXIDE - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia.

FLUORIDES - Serious bone erosion (Osteoporosis) and mottling of teeth.

SILICA (AMORPHOUS) - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.

TITANIUM DIOXIDE - Pulmonary irritation and slight fibrosis.

MANGANESE - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's Disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems.

CHROMIUM - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds.

NICKEL, NICKEL COMPOUNDS - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.

COPPER - Copper poisoning has been reported in the literature from exposure to high levels of copper. Liver damage can occur due to copper accumulating in the liver characterized by cell destruction and cirrhosis. High levels of copper may cause anemia and jaundice. High levels of copper may cause central nervous system damage characterized by nerve fiber separation and cerebral degeneration.

MOLYBDENUM - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia.

ALUMINUM, ALUMINUM OXIDE - Pulmonary fibrosis and emphysema.

COLUMBIUM - No adverse long term health effects have been reported in the literature

TUNGSTEN - Long term overexposure may cause pulmonary fibrosis characterized by a rapid onset of cough, sputum and dyspnea on exertion.

ZIRCONIUM - May cause pulmonary fibrosis and pneumoconiosis.

STRONTIUM COMPOUNDS - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets"

MAGNESIUM, MAGNESIUM OXIDE - No adverse long term health effects have been reported in the literature.

ANTIMONY COMPOUNDS - Metal fume fever, dermatitis, keratitis, conjunctivitis and ulceration and perforation of the nasal septum. Avoid conditions in which fresh hydrogen will react with antimony to form stibine which is extremely toxic. IARC considers antimony trioxide as possibly carcinogenic to humans (Group 2B).

BARIUM COMPOUNDS - Long term overexposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart, circulatory system and musculature.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Persons with pre-existing impaired lung functions (asthma-like conditions).

EMERGENCY AND FIRST AID PROCEDURES:

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY:

Chromium VI and nickel compounds must be considered carcinogens according to OSHA (29 CFR 1910.1200). Chromium VI compounds are classified as IARC Group 1 and NTP Group 1 carcinogens. Nickel compounds are classified as IARC Group 1 and NTP Group 2 carcinogens.

Welding fumes must be considered as possible carcinogens under OSHA (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65:

WARNING: These products contain or produce chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402 for more detail on any of the following.

VENTILATION: Use enough ventilation, local exhaust at the arc or both to keep the fumes and gases below PEL/TLVs in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below PEL/TLVs.

EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

SPECIAL PRECAUTIONS (IMPORTANT): Maintain exposure below the PEL/TLVs. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLVs. Always use exhaust ventilation. Refer to the following sources for important additional information: ANSI Z49.1 from The American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA (29 CFR 1910) from the U.S. Department of Labor, Washington, DC 20210.

Hobart Brothers believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers cannot make any expressed or implied warranty as to this information.

Health and Safety

Stainless wire electrodes, filler wire/rods and strip electrodes

Material Safety Data Sheets

This safety data sheet complies with European Commission directive 93/112/EC, (OJEC No. L 314) and ISO 11014:1 1994 (E).



1. Product and company identification

2. Composition /classification/information of ingredients

The elements listed in the table below are defined in accordance with paragraph 2 (a-c) of the Commission Directive 93/112/EC Annex (TLV-threshold limit values according to ACGIH, hazard classification according to OJEC No. L 314

Table 2. Ingredients, weight-%

Wire/rod/strip ingredients	Weight-%	CAS#	TLV mg/m	Hazard classification
Si	0-1	7440-21-3	10	N.A.
Mn	0-5	7439-96-5	5	N.A.
Cr	12-35	7440-47-3	0.5	N.A.
Ni	0-75	7440-02-0	1	Xn, Canc3, R40-R43
Mo	0-10	7439-98-7	5	N.A.
Nb	0-4	7440-03-1	-	N.A.
Cu	0-2	7440-50-8	0.2	N.A.
Fe	2-75	7439-89-6	5	N.A.

3. Hazards identification

Avoid eye contact or inhalation of dust from the product. Skin contact is normally no hazard but should be avoided to prevent possible allergic reactions. Occupational exposure limits of components are described in paragraph No. 2. When this product is used in a welding process the most important hazards are heat, radiation, electrical shock and fumes.

Heat: Spatter, melting metal and arc rays can cause burn injuries and start fires. Radiation: Arc rays can severely damage eyes or skin.

Shock: Electrical shock can kill

Fumes: Overexposure to welding fumes may result in symptoms like dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to welding fumes may affect pulmonary function.

4. First-aid measures

Inhalation: If breathing is difficult, provide fresh air and call physician.

Eye contact: For radiation burns due to arc flash, see physician

Skin contact: For skin burns from arc radiation, see physician

General: Move to fresh air and call for medical aid

5. Fire fighting measures

No specific for welding consumables.

6. Accidental release measures

Personal precautions: Refer to section 8.

Environmental precautions: Refer to section 13.

Methods for cleaning up: Refer to section 13.

▼ 7. Handling and storage

Handling:

Avoid exposure to welding fumes, radiation, spatter, electrical shock, heated materials and dust. Do not ingest. Handle with care to avoid stings and cuts. Spooled wire and strip can spring.

Storage:

Keep separate from chemical substances like acids which could cause chemical reactions.

▼ 8. Exposure controls/personal protection

Engineering measures:

Ensure sufficient ventilation and exhaust at the arc, to keep the welding fumes and gases away from welders breathing zone. Keep working place and protective clothing clean and dry.

Train welder to avoid contact with live electrical parts and insulate conductive parts. Check condition of protective clothing and equipment on a regular basis.

Personal protective equipment:

Use respirator or air supplied respirator when welding – brazing in a confined space. Wear hand, head, eyes and body protection like welders gloves, helmet or face shield with filter lens, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry.

▼ 9. Physical and chemical properties

Appearance:	Solid, non-volatile
Odour:	Odourless
Colour:	Metallic lustre
Form:	Wire diameter 0.6-5.0mm

▼ 10. Stability and reactivity

General:	This product is intended only for normal welding purposes.
Stability:	This product is stable under normal conditions.
Reactivity:	Contact with chemical substances like acids could cause generation of gas. Hazardous decomposition products includes those from the volatilization, reaction or oxidation of the materials listed in section 2 and those from the base metal. Reasonably expected fume constituents of this product would include oxides of metals as iron, manganese, nickel and chromium. Reasonably expected gaseous products would include nitrogen oxides and ozone.

▼ 11. Toxicological information

Inhalation of welding fumes and gases can be dangerous to your health. Classification of welding fumes is difficult because of varying base materials, coatings, air contaminations and processes.

Acute toxicity: Overexposure to welding fumes may result in symptoms like dizziness, nausea, dryness or irritation of the nose, throat or eyes.

Chronic toxicity: Overexposure to welding fumes may effect pulmonary function. Certain chromium and nickel compounds, like Cr 6+ are suspected of being cancer causing agents. Overexposure to manganese may affect the nervous system.

▼ 12. Ecological information

No known harmful effects. No precautions are required. The preparation is normally inert in aqueous solutions.

▼ 13. Disposal considerations

The preparation should be recycled to as large extent as possible since it is a valuable raw material in production of stainless steels. Information can be given by the supplier.

▼ 14. Transport information

No international regulations or restrictions are applicable.

▼ 15. Regulatory information

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe any federal and local regulations.

Take precautions when welding and protect yourself and others. FUMES AND GASES can be dangerous to your health. ARC RAYS can injure eyes and burn skin. ELECTRIC SHOCK can kill. Keep your head out of the fumes. Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone, and the general area. Wear correct eye, ear and body protection. Do not touch live electrical parts.

WARNING:

Welding fumes and gases may be dangerous to your health. Avoid breathing the fumes and gases. Use adequate ventilation. Arc rays may injure eyes and burn skin. Use adequate protective equipment.

ADVERTISEMENT.

Les gaz et les vapeurs de soudage peuvent présenter des risques pour la santé. Éviter de les respirer. Assurer une ventilation

adéquate. Les arcs peuvent causer des blessures aux yeux ou des brûlures de la peau. Utiliser un équipement de protection adéquat.

WARNING:

Der Rauch dieses Schweißzusatzes enthält Chrom, Nickel und/oder Kobaltverbindungen. Schweißrauche absaugen!

VARNING FÖR INANDNING AV SVETS RÖK

Medelhög akut giftighet. Risk för skador vid långvarig eller ofta upprepad inandning. Se till att ventilationen är god.

ADVARSEL MOT INNÅNDING AV SVEISERÖYK OG GAS-SER

Fare ved innånding. Fare for langtidseffekter. Sørg for god ventilasjon.

VÄLTÄ HITSAUSSAVUJEN SISÄÄ HENGITTÄMIS

Pitkäaikainen altistus voi olla haitallista. Huolehdi tuuletuksesta. Katso hitsauspuikon turvaohjelehti.

Symbols:



R-phrases: R40 - Limited evidence of a carcinogenic effect

R43 - May cause sensitization by skin contact

S-phrases: S23 - Do not breathe fumes

S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

S52 - Use only well ventilated areas

16. Other information

Refer to:

USA

American National Standard Z49.1 "Safety in Welding and Cutting", American Welding Society, 550 North Le Jeune Road, Miami, Florida, 33135; OSHA Safety and Health Standards, 29CFR 1910, U.S. Gov. Printing Office, Washington, D.C. 20402; American Conference and Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.

UK

WMA Publication 236 and 237, "Hazards from Welding fume", "The arc welder at work some general aspects of health and safety", available from the manufacturer.

Germany

Unfallverhütungsvorschrift "Schweißen, Schneiden und verwandte Verfahren" (VBG 15).

Sandvik request the users of this product to study this SafetyData sheet (S.D.S.) and become aware of product hazards and safety information. To promote safe use of this product a user should:

- notify its employees, agents and contractors of the information on this S.D.S and any product hazards/safety information.
- furnish this same information to each of its customers for the product.
- request such customers to notify employees and customers from the same product hazards and safety information.

DATE : 12/09/03 PAGE 1 OF 3
SUPERSEDES: 26/06/03 PRODUCT NUMBER: 2242
STREAKPROOF GLASS CLEANER

SECTION I - E M E R G E N C Y C O N T A C T S

EMERGENCY TELEPHONE

660 LEPINE AVENUE
DORVAL, QUEBEC H9P-1G2
TELEPHONE (514) 631-9041
BETWEEN 8:00AM - 4:30PM

NON-OFFICE HOURS, WEEKENDS,
OR HOLIDAYS,
(CANUTEC) CALL COLLECT
(613) 996-6666

SECTION II - H A Z A R D O U S I N G R E D I E N T S

DESIGNATIONS	TLV (PEM)	EFFECTS (SEE REVERSE)	% IN PROD.
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THIS PRODUCT CONTAINS NO INGREDIENTS WHICH ARE INHERENTLY HAZARDOUS AS DEFINED BY WHMIS.

THE WHMIS CLASSIFICATION FOR THIS PRODUCT IS: N/A

SECTION III - T O X I C O L O G I C A L D A T A

SPECIAL NOTE: MSDS DATA PERTAINS TO THE PRODUCT AS DISPENSED FROM THE CONTAINER. ADVERSE HEALTH EFFECTS WOULD NOT BE EXPECTED UNDER RECOMMENDED CONDITIONS OF USE (DILUTED) SO LONG AS PRESCRIBED SAFETY PRECAUTIONS ARE PRACTICED.

ACUTE EFFECTS OF OVEREXPOSURE: There are no known effects from acute overexposure to this product. However, in light of good industrial hygiene, exposure to any chemical should be kept to a minimum.

CHRONIC EFFECTS OF OVEREXPOSURE: There are no known effects from chronic exposure to this product.

EST'D PEL/TLV: Not established PRIMARY ROUTES OF ENTRY: N/A

SECTION III - T O X I C O L O G I C A L D A T A (CONTINUED)

HMIS CODES: HEALTH 0;FLAM. 0;REACT. 0;PERS. PROTECT. A ;CHRONIC HAZ. No

FIRST AID PROCEDURES:

SKIN----- Flush contaminated skin with plenty of water. Consult a physician if irritation develops.

EYES----- Immediately flush contaminated skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops.

INHALATION-- Move exposed person to fresh air. If irritation persists, get medical attention promptly.

INGESTION--- If this product is swallowed, do not induce vomiting. If victim is conscious give plenty of water to drink. Get medical attention at once.

STREAKPROOF GLASS CLEANER

SECTION - - S P E C I A L P R O T E C T I O N I N F O R M A T I O N

PROTECTIVE CLOTHING : Wearing neoprene or nitrile gloves is recommended when prolonged excessive contact occurs (e.g., immersing hands)
EYE PROTECTION : Wearing tight-fitting safety glasses is recommended, if splashing may occur.
RESPIRATORY PROTECTION : No special measures are required.
VENTILATION : No special measures are required.

SECTION V - P H Y S I C A L D A T A

BOILING POINT (F) : ~ 100 SPECIFIC GRAVITY : 1.001
VAPOR PRESSURE(MMHG): N/D VOC. CONTENT (CONCENTRATE) : 1.0% N/A
VAPOR DENSITY(AIR=1): N/D EVAPORATION RATE(water =1): 1.0
SOLUBILITY IN WATER : Complete PH(CONCENTRATE) : 9.0-10.0
PH(USE DILUTION OF N/D) : N/D
APPEARANCE AND ODOR : Clear, blue liquid With a faint ammonia odor

SECTION VI - F I R E A N D E X P L O S I O N D A T A

FLASH POINT(F) (METHOD USED): N/A (N/A)
FLAMMABLE LIMITS LEL N/A UEL N/A
EXTINGUISHING MEDIA : Non-combustible
SPECIAL FIRE FIGHTING : Wear self-contained positive pres. Breathing apparatus.
UNUSUAL FIRE HAZARDS : None

SECTION VII - R E A C T I V I T Y D A T A

STABILITY : Stable
INCOMPATIBILITY(AVOID) : None
POLYMERIZATION : Will not occur
HAZARDOUS DECOMPOSITION : Carbon dioxide, carbon monoxide, and other unidentified organic compounds.

SECTION VIII - S P I L L A N D D I S P O S A L P R O C E D U R E S

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED : Observe safety precautions in Section 6 during clean-up. Absorb spill on inert absorbent material (e.g. Zep-O-Zorb). Pick up and place residue in a suitable waste container. Wash area thoroughly with a detergent solution.

WASTE DISPOSAL METHOD : Unusable material should be properly drummed. Consult local, provincial, and federal agencies for proper methods of disposal. Do not contaminate water supply when disposing of wastes or containers.

RCRA HAZ. WASTE NOS. : N/A

SECTION IX - S P E C I A L P R E C A U T I O N S

PRECAUTIONS TO BE TAKEN WHEN HANDLING AND STORING : Store tightly-closed container in a dry area at temperatures between 4-49 C. Keep product out of eyes. Keep out of the reach of children Clothing or shoes which become contaminated with substance should be removed promptly and not re worn until thoroughly cleaned

08/01/2004

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SUPERSEDES: 26/06/03 PRODUCT NUMBER: 2242
STREAKPROOF GLASS CLEANER

SECTION X - T R A N S P O R T A T I O N D A T A
DOT PROPER SHIPPING NAME

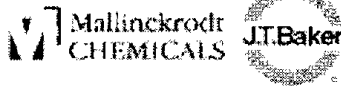
... ER : DOT LABEL/PLACARD:

PREPARED BY: ZEP RESEARCH & DEVELOPMENT DIVISION (514) 631-9041.

MSDS Number: S8234 * * * * * Effective Date: 11/04/04 * * * * * Supercedes: 02/18/02

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC, 513-696-6566

Outside U.S. and Canada
Chemtrec, 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergency involving a spill, leak, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service at 600-852-2537 for assistance.

SULFURIC ACID, 52 - 100 %

1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid

CAS No.: 7664-93-9

Molecular Weight: 98.08

Chemical Formula: H₂SO₄ in H₂O

Product Codes:

J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5858, 5859, 5868, 5889, 5897, 5961, 5971, 5997, 6902, 9671, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694

Mallinckrodt: 21201, 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H850, H976, H996, V651, XL003

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 2 - Moderate

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.

Ingestion:

Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.

Skin Contact:

Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

Eye Contact:

Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.

Chronic Exposure:

Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.

Ingestion:

DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.

Eye Contact:

Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

5. Fire Fighting Measures

Fire:

Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.

Explosion:

Contact with most metals causes formation of flammable and explosive hydrogen gas.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Sulfuric Acid:

- OSHA Permissible Exposure Limit (PEL) -
1 mg/m³ (TWA)

- ACGIH Threshold Limit Value (TLV) -

1 mg/m³(TWA), 3 mg/m³ (STEL), A2 - suspected human carcinogen for sulfuric acid contained in strong inorganic acid mists.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear oily liquid.

Odor:

Odorless.

Solubility:

Miscible with water, liberates much heat.

Specific Gravity:

1.84 (98%), 1.40 (50%), 1.07 (10%)

pH:

1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.

% Volatiles by volume @ 21C (70F):

No information found.

Boiling Point:

ca. 290C (ca. 554F) (decomposes at 340C)

Melting Point:

3C (100%), -32C (93%), -38C (78%), -64C (65%).

Vapor Density (Air=1):

3.4

Vapor Pressure (mm Hg):

1 @ 145.8C (295F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.

Hazardous Decomposition Products:

Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.

Conditions to Avoid:

Heat, moisture, incompatibles.

11. Toxicological Information

Toxicological Data:

Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m³/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.

Carcinogenicity:

Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.

Environmental Toxicity:

LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified;
LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

International (Water, I.M.O.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2P

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 2 Other: **Water reactive**

Label Hazard Warning:

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Do not contact with water.

Label First Aid:

In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MATERIAL SAFETY DATA SHEET

SECTION 1

PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: SPARTAN EP ALL SEASON
Product Description: Base Oil and Additives
MSDS Number: 08211
Intended Use: Gear oil

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division
111 St. Clair Avenue West
Toronto, ONT. M5W 1K3 Canada
24 Hour Environmental / Health Emergency Telephone 519-339-2145
Transportation Emergency Phone Number 519-339-2145
Product Technical Information 1-800-268-3183
Supplier General Contact 1-800-567-3776

SECTION 2

COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3

HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Excessive exposure may result in eye, skin, or respiratory irritation. Low order of toxicity. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4

FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Skin Contact

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5	FIRE FIGHTING MEASURES
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EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Sulphur Oxides, Aldehydes, Smoke, Fume, Oxides of carbon, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: 145°C (293°F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6	ACCIDENTAL RELEASE MEASURES
------------------	------------------------------------

Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Confine the spill immediately with booms. Stop leak if you can do so without risk. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.



Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mist can occur, the following are recommended: 5 mg/m³ (mineral oil) - ACGIH TLV; 10 mg/m³ (mineral oil) - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
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Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Form: N/D
Colour: dark brown
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.87
Flash Point [Method]: 145°C (293°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: 229°C (444°F) - 615°C (1139°F)
Vapour Density (Air = 1): N/D
Vapour Pressure: < 0.1 kPa (0.75 mm Hg) at 20°C
Evaporation Rate (N-Butyl Acetate = 1): < 0.1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 150 cSt (150 mm²/sec) at 40°C
Oxidizing properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -33°C (-27°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
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Acute Toxicity

Route of Exposure	Conclusion / Remarks
INHALATION	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
 2 = IARC 2A

3 = IARC 2B
 4 = ACGIH ALL

5 = ACGIH A1
 6 = ACGIH A2

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13	DISPOSAL CONSIDERATIONS
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Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning (where applicable): Empty containers may retain residue and can be dangerous. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14	TRANSPORT INFORMATION
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LAND (TDG) : Not Regulated for Land Transport

LAND (DOT) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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WHMIS Classification: Not controlled

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4	3 = TSCA 5e	5 = TSCA 12b
2 = TSCA 5a2	4 = TSCA 6	6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information is available.

WHMIS Classification: Not controlled

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Imperial Oil

Product Name: SPARTAN EP ALL SEASON

Revision Date: 13Jan2005

Page 8 of 8

Prepared By: Imperial Oil Limited, IH and Product Safety



Genencor International, Inc.* PO #MN270448

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT INFORMATION

Product Name: Purafect® 4000E

Product Code: A01162

Chemical Name: Subtilisin

Manufacturer/Supplier: Genencor International, Inc.
200 Meridian Centre Blvd.
Rochester, NY 14618
(800) 847-5311
(716) 256-5200

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Components	TLV	PEL	CAS Number:
Subtilisin	60 ng/m ³ **	None established	9014-01-1
Titanium dioxide	10 mg/m ³	10 mg/m ³ total dust 5 mg/m ³ respirable fraction	3463-67-7

SECTION 3 - PHYSICAL DATA

Boiling Point: NA Specific Gravity (H₂O = 1): NA Vapor Pressure (mm Hg): NA

Vapor Density (Air = 1): NA Solubility in Water: Soluble Percent Volatile (by weight): NA

Evaporation Rate Appearance and Odor: Off-white granules
(butyl acetate = 1): NA

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flashpoint (test method): NA Auto Ignition Temperature: NA

Flammable Limits In Air, Volume %:
Lower Limit: NA Upper Limit: NA

Extinguishing Media: No special requirements. Special Firefighting Procedure: No special requirements.

Unusual Fire and Explosion Hazards: None known.

SECTION 5 - REACTIVITY DATA

Stability: Stable X Conditions to Avoid: Incompatibility (Materials to Avoid):
Unstable None known None known

Hazardous Decomposition Hazardous May Occur Conditions to Avoid: None known
Products: None known Polymerization: Will Not Occur X

**ACGIH TWA, as 100% pure crystalline proteolytic enzyme, based on "high volume" sampling.



SECTION 6 - TOXICOLOGICAL PROPERTIES

Acute Effects

Swallowed: Amounts which will be swallowed incidental to industrial handling are not likely to cause injury.

Eye Contact: Will cause irritation upon direct contact.

Skin Contact: Prolonged skin contact will cause mild irritation.

Inhalation: Will cause respiratory tract irritation. Inhalation of enzyme dust will cause allergic type reactions, including asthmatic bronchitis, in susceptible individuals on repeated exposure.

Chronic Effects: Repeated inhalation of enzyme dust by susceptible individuals will result in allergenic sensitization. Subsequent exposure may result in respiratory irritation, inflammation of the mucous membranes of the nose and eyes, coughing, chest tightness, and difficulty in breathing.

Medical Conditions Generally Aggravated by Exposure: Atopy, asthma

Chemical Listed as Carcinogen or Potential Carcinogen:	National Toxicology Program:	Yes <u> </u>	No <u>X</u>	I.A.R.C Monographs:	Yes <u> </u>	No <u>X</u>	OSHA:	Yes <u> </u>	No <u>X</u>
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SECTION 7 - FIRST AID PROCEDURES

Swallowed: Rinse mouth and throat thoroughly with water. Should irritation occur consult a physician.

Skin: Wash skin thoroughly with soap and water. Consult a physician if irritation occurs.

Eyes: Flush eyes thoroughly with water, consult a physician.

Inhaled: Remove from exposure. If irritation or allergic response occurs, consult a physician.

SECTION 8 - PROTECTION AND PREVENTIVE MEASURES

Respiratory Protection: Exposure to contaminated atmospheres requires use of a respirator approved by NIOSH for this type of dust. The respirator use limitations made by NIOSH and by the manufacturer must be observed. A Respiratory Protection Program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Ventilation: Local exhaust may be necessary to prevent dust release.

Protective Gloves: Impervious (rubber, polyethylene).

Eye Protection: Safety glasses, goggles.

Other Protective Equipment: Sufficient to prevent direct skin contact.



SECTION 9 - STORAGE AND DISPOSAL

Storage and Handling Precautions: Maintain good housekeeping. Avoid generation of dust, recurring spillage and skin contact.

Waste Disposal Methods: Landfill absorbed material in closed container or flush to waste sewer as Federal, State, and Local laws and regulations allow.

Spill, Leak and Disposal Procedures: Vacuum or wet material and absorb with inert materials and transfer to containers for disposal. Minimize aerosolization (dust formation) during clean-up.

The above information is based on data available to us and considered to be accurate. However, NO WARRANTY is expressed or implied regarding the accuracy of this information, the results to be obtained from the use thereof, or the hazards connected with the use of the material. As the information contained herein may be applied under conditions beyond our control and with which we are unfamiliar, we do not assume any responsibility for the results of its use. This information is furnished upon the condition that the persons receiving it shall make their own determinations of the effects, properties and protections which pertain to their particular conditions.

Date of Issue: January 15, 2001

Supersedes: September 11, 1997

NA = Not applicable

ND = Not determined