


TRICAN MATERIAL SAFETY DATA SHEET

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION		
Product Name	TSS 2000	Code
Supplier	Trican Well Service Ltd. 2900, 645 – 7 th Ave S.W. Calgary, Alberta, T2P 4G8 For Product Information/MSDS Call: 403-266-0202 or 403-723-3688 (8:00 AM – 5:00 PM MST, Monday – Friday)	Revision Date
Product Uses	Elemental sulfur solvent	Supersedes Date New issue
24 Hour Emergency Numbers	CANUTEC 613-996-6666 (Canada 24 hours)	Original Creation May 27, 2010
WHMIS (Pictograms) 		WHMIS (Classification) B3 Combustible Liquid D2A Very Toxic material causing other toxic effects D2B Toxic materials causing other toxic effects

SECTION 2. HAZARDS IDENTIFICATION	
Hazard Summary	<p>WARNING! COMBUSTIBLE. RELEASES TOXIC H₂S GAS. IRRITANT. ASPIRATION HAZARD. CANCER HAZARD. ENVIRONMENTAL HAZARD</p> <p>Combustible. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Contact with hot material can cause thermal burns which may result in permanent damage. Material can accumulate static charges which may cause an incendiary electrical discharge.</p> <p>Hydrogen sulphide, a highly toxic gas, is expected to be present. Concentrations in the vapour space may be as high as 100 ppm, especially in enclosed spaces, heated transport vessels and spill or leak situations. Odour does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.</p> <p>Irritating to skin. May cause cancer. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans.</p> <p>Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.</p>
Routes of Exposure	Eyes, skin, inhalation and ingestion.
Potential Acute Health Effects	
Eyes Contact	Vapours or mists may cause eye irritation. Hydrogen sulphide gas is irritating to eyes and has been implicated in some eye damage.
Skin Contact/Absorption	Irritating to skin. May produce sun-sensitivity in skin. High pressure injection under the skin may cause serious damage.
Inhalation	Vapours or mists may cause irritation of nose, throat and respiratory tract. Overexposure to hydrogen sulphide can result in respiratory irritation. High level (700 ppm) acute exposure can result in sudden death. High concentrations will lead to cardiopulmonary arrest due to nervous system toxicity and pulmonary edema. Lower levels (150 ppm) may overwhelm sense of smell, eliminating warning of exposure. Symptoms of overexposure to H ₂ S include headache, fatigue, insomnia, irritability, and gastrointestinal problems.
Ingestion	Ingestion may cause gastrointestinal irritation or ulceration.
Medical Conditions Aggravated by Exposure	Not available
<i>See also Toxicological Information (Section 11)</i>	

Additional Remarks	Not available
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SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

Name	CAS #	% (wt)
Catalytic Cracked Clarified Oil	64741-62-4	0-100
Residual Fuel Oil	68476-33-5	0-70
Heavy Atmospheric Gas Oil	68915-96-8	0-50
Light Atmospheric Gas Oil	64741-44-2	0-40
Light Catalytic Cracked Distillate	64741-59-9	0-40

SECTION 4. FIRST AID MEASURES

Eye Contact	Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. If symptoms develop, seek medical attention.
Skin Contact	Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. 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. For hot product: Immediately immerse in or flush affected area with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze and get prompt medical attention.
Inhalation	Remove person to fresh air. If not breathing, provide artificial respiration. If breathing is difficult or symptoms develop, seek prompt medical attention.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of material into lungs. Seek medical attention immediately.
Notes to Physician	Treat symptomatically.
Additional Remarks	Not available

SECTION 5. FIRE FIGHTING MEASURES

Conditions of Flammability	Combustible. Hazardous material. Firefighters should consider protective equipment indicated in Section 8. The product may form flammable mixtures and can burn only when heated above the flash point.
Extinguishing Media	Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use solid water stream as it may scatter material and spread the fire. Water spray may be used to cool containers exposed to fire conditions.
Protection of Firefighters	As in any fire, wear full fire fighting gear including NIOSH-approved positive pressure self-contained breathing apparatus.
Hazardous Combustion Products	Hydrogen sulphide, smoke, fume, aldehydes, sulphur oxides, incomplete combustion products, oxides of carbon.
Sensitivity to Mechanical Impact	Not expected
Sensitivity to Static Discharge	Sensitive to static discharge. Bond and ground transfer equipment. This material is a static accumulator.
Additional Remarks	NFPA Rating: Health 2; Flammability 2; Instability 0. <i>0=Insignificant 1 = Slight 2= Moderate 3= High 4 = Extreme</i>

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Eliminate all ignition sources. Isolate hazard area and restrict access. Try to work upwind of spill. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8). Shut off leak if it can be done safely.
Environmental Precautions	Remove debris in path of spill prior to oiling and remove contaminated debris from shoreline and water surface. Dispose of according to local regulations.

	Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.
Containment Methods	Dike and contain land spills with inert material (earth, clay or sand).
Clean Up Methods	Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces. Water Spill: Stop leak if you can do so without risk. Warn other shipping. Material will sink. Remove material, as much as possible, using mechanical equipment.
Additional Remarks	Waste must be disposed of in accordance with federal, provincial and local environmental control regulations.

SECTION 7. HANDLING AND STORAGE

Equipment	Locate safety shower and eyewash station in immediate use area. Use a non-sparking or explosion-proof tools and equipment around this material.
Procedures	<p>Fire Prevention Eliminate all ignition sources. Flammable vapours may form an ignitable mixture with air. Use proper bonding and/or earthing procedures. Material can accumulate static charges which may cause an electrical spark (ignition source). Empty containers may contain flammable product residue. Do NOT cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity or other sources of ignition.</p> <p>Worker Contact Avoid all personal contact. Wear appropriate personal protective equipment. Avoid contact with eyes, skin, and clothing. Avoid breathing vapours or spray mists. Use only with adequate ventilation. Harmful amounts of H₂S may be present. The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulfide require that air monitoring alarms be used if concentrations are expected to reach harmful levels, such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 10 ppm TLV, the area should be evacuated unless respiratory protection is in use. Prevent small spills and leakage to avoid slip hazard. Maintain good personal hygiene. Do not smoke, eat or drink when handling this product. Wash thoroughly after handling product and before eating, drinking or smoking.</p>
Storage Requirements	Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Drums must be earthed and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.
Additional Remarks	Not available

SECTION 8. EXPOSURE CONTROL/PERSONAL PROTECTION

Exposure Guidelines / Limits	Not established for product.
Exposure Guideline / Limits for Components	
Catalytic Cracked Clarified Oil	Supplier recommended TWA 0.1 mg/m ³ total oil mist; skin absorption.
Residual Fuel Oil [benzene solubles]	Supplier recommended TWA 0.1 mg/m ³ aerosol; skin absorption.
Hydrogen sulfide	ACGIH TLV: TWA 10 ppm; STEL 15 ppm.
Light Atmospheric Gas Oil	Supplier recommended: TWA 200 mg/m ³ vapour.
Please consult with local authorities for acceptable provincial exposure limits since values can vary from jurisdiction to jurisdiction.	
Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours or mists below their respective threshold limit value. Ventilation equipment must be explosion-proof.
Personal Protection	
Personal Protective Equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended, however, to determine the level of person protective equipment appropriate for these job tasks and conditions.	
Respirator	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: Positive-pressure, air-supplied respirator in areas where H₂S vapours may accumulate.

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.

- Hands** Thermally protective, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.
- Eyes** Safety-glasses with side-shields. If contact with material may occur, wear a face shield as well.
- Body** Wear long sleeves and pants of an impervious material to prevent skin contact. If product is hot, thermally protective, chemical resistant apron and long sleeves are recommended.
- Feet** Steed toed, chemical resistant boots.
- Other** Emergency eyewash fountains and safety showers should be in the vicinity of any potential exposure.

Protective Clothing (Pictograms)



Additional Remarks Not available

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Viscous liquid
Odour and Appearance	Petroleum or solvent odour; black colour
Odour Threshold	Not available
Specific Gravity	1.036 - 1.115 @ 15 °C
Flashpoint	>61 °C
Upper Flammable Limit (% by volume)	Not available
Lower Flammable Limit (% by volume)	Not available
Autoignition Temperature	Not available
Vapour Density (air=1)	Not available
Vapour Pressure	0.1 kPa (0.75 mm Hg) @ 20 °C
Evaporation Rate	Not available
Boiling Point	Not available
Freezing Point	Not available
Pour Point	<21 °C
pH	Not available
Viscosity	100 to 2500 cSt @ 50°C
Solubility in Water	Negligible
Coefficient of Water/Oil	Not available
Additional Remarks	Not available

SECTION 10. STABILITY AND REACTIVITY DATA

Chemical Stability	Stable under normal conditions.
Conditions of Instability	Avoid open flames and high energy ignition sources.
Incompatible Material	Strong oxidizing agents, strong acids, halogens, alkalis.
Conditions of Reactivity	None specified
Hazardous Decomposition Products	Material does not decompose at ambient temperatures.
Hazardous Polymerization	Will not occur.
Additional Remarks	Not available

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Toxicity	No data for product. Data is based on assessment of the components and/or structurally similar materials. Minimally toxic by all routes of exposure.
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	Acute LD50 (rat, oral): >2000 mg/kg Acute LD50 (rabbit, dermal): >2000 mg/kg Acute LC50 (rat, inhalation): >5000 mg/kg
Effects of Acute Exposure	<i>See Hazards Identification (Section 2)</i>
Effects of Chronic Exposure	HYDROGEN SULPHIDE: Chronic health effects due to repeated exposures to low levels of H2S have not been established. Symptoms of overexposure to higher levels of H2S include headache, fatigue, insomnia, irritability, and gastrointestinal problems. Repeated exposures to approximately 25 ppm will irritate mucous membranes and the respiratory system and have been implicated in some eye damage. MIDDLE DISTILLATES WITH CRACKED STOCKS: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. RESIDUAL FUEL OIL: Carcinogenic in animal tests. Caused mutations in-vitro. Dermal exposure to high concentrations resulted in maternal toxicity, decreased fetal weight and fetal survival, and some external fetal malformations. Dermal studies in animals: increased mortality, skin irritation, liver, kidney, thymus, bone marrow, blood and lymphoid tissue toxic effects. Possible allergen and photoallergen.
Irritancy of Product	<i>See Hazards Identification (Section 2)</i>
Skin Sensitization	<i>See Effects of Chronic Exposure.</i>
Respiratory Sensitization	Not expected
Carcinogenicity	Catalytic cracked clarified oil (CAS # 64741-62-4) and Residual Fuel Oil (CAS # 68476-33-5) are classified by IARC as Group 2B Possibly Carcinogenic to Humans based on animal studies.
Reproductive Toxicity	<i>See Effects of Chronic Exposure.</i>
Teratogenicity	<i>See Effects of Chronic Exposure.</i>
Embryotoxicity	<i>See Effects of Chronic Exposure.</i>
Mutagenicity	<i>See Effects of Chronic Exposure.</i>
Synergistic Products/Effects	None expected
Additional Remarks	Not available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity	Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment. The information given is based on data available for the material, the components of the material, and similar materials.
Degradability	Majority of components -- Expected to be inherently biodegradable. More volatile component -- Expected to degrade rapidly in air.
Bioaccumulation	Base oil component -- Potential to bioaccumulate is low.
Mobility	More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids. High molecular wt. component -- Low water solubility, expected to sink and migrate into the sediment. Expected to partition to sediment and wastewater solids.
Additional Remarks	Do not allow product or run-off from fire control to enter storm or sanitary sewers, lakes, rivers, streams or public waterways. Block off drains and ditches.

SECTION 13. DISPOSAL CONSIDERATIONS

	Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable federal, provincial and local regulations.
Additional Remarks	Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change. Empty Container Warning Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored

until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. 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.

SECTION 14. TRANSPORT INFORMATION

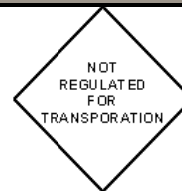
TDG Classification

If the loading temperature does not exceed the flashpoint and the flashpoint is above 61 °C, this material is Not Regulated in Canada.

OR

If offered for transport at or above 61 deg C, then

ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash point above 60 deg C and with loading temperature at or above its flashpoint, Class 3, UN3256, PG III



Marine Pollutant	Not available
Additional Transport Information	Not available
Emergency Response Guide	Guide No. 128

SECTION 15. REGULATORY INFORMATION

Canadian Regulations

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

Environmental Regulations Not available.

DSL Inventory All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

TSCA Inventory Status All components are included or are exempted from listing on the US Toxic Substances Control Act Inventory.

Other Regulatory Information No further regulatory information is available.

SECTION 16. OTHER INFORMATION

Other Special Considerations New issue.

Trican Well Service Ltd. Disclaimer

NOTE: The information on this MSDS is based on data which is considered to be accurate. Trican Well Service Ltd., however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do 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.

This MSDS was prepared and is to be used for this product. If the product is used as a component n another product, this MSDS information may not be applicable.

END OF MATERIAL SAFETY DATA