SAFETY DATA SHEET

Revision: 4.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

High Sulfur Fuel Oil

SECTION 1: IDENTIFICATION

Product identifier

Product name	High Sulfur Fuel Oil
CAS No.	68476-30-2

Other means of identification None

Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	Fuel
Uses advised against	Anything other than the above.

Details of the supplier of the safety data sheet

Supplier	Vitol Inc. 2925 Richmond Ave, 11th Floor Houston, TX 77098
Telephone	(713) 230-1000
Fax	713-230-1185
E-mail (competent person)	SDSHOU@vitol.com

Emergency telephone number

Emergency Phone No.	Chemtrec: US/Canada: 1-800-424-9300 (24h) Mexico: 800 681 9531 (24h)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards	Flammable Liquid, Category 3
Health hazards	Skin Corrosion/Irritation, Category 2 Acute toxicity, Category 4 (Inhalation) Carcinogen, Category 2 Specific target organ toxicity — repeated exposure, Category 2
Environmental hazards	Hazardous to the aquatic environment, Acute, Category 3 Hazardous to the aquatic environment, Chronic, Category 2

Label elements

Hazard Pictogram(s)

Signal Word(s) DANGER

Hazard Statement(s)

Flammable liquid and vapour.
Causes skin irritation.
Harmful if inhaled.
Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life.
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Store in a well-ventilated place. Keep cool.

Obtain special instructions before use.
Do not breathe vapour.
Wear protective gloves/eye protection/face protection.
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
Immediately call a POISON CENTER/doctor.
Do NOT induce vomiting.
Store locked up.
Avoid release to environment.
Dispose of contents in accordance with local, state or national legislation.

Other hazards

The vapour is heavier than air; beware of pits and confined spaces. May cause irritation to eyes and air passages. Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

Percent of the mixture consists of ingredient(s) of unknown acute toxicity:

0% of the mixture consists of ingredients of unknown acute inhalated toxicity.
0% of the mixture consists of ingredients of unknown acute oral toxicity.
0% of the mixture consists of ingredients of unknown acute dermal toxicity.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances

Classification: OSHA HCS (29 CFR 1910.1200)

Chemical identity of the substance	%W/W	CAS No.	EC No.
Fuel oil, residual	60 - 100	68476-30-2	270-671-4

Hazardous constituents

Chemical identity of the substance	%W/W	CAS No.	EC No.
Sulfur	0.1 – 1	7704-34-9	231-722-6
Benzene	< 0 .1	71-43-2	200-753-7
Naphthalene	< 0 .1	91-20-3	202-049-5

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider

The vapour is heavier than air; beware of pits and confined spaces. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance.

Inhalation

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If symptoms persist, obtain medical attention.

Skin contact

IF ON SKIN (or hair): Remove contaminated clothing immediately and drench affected skin with plenty of water, then wash with soap and water. If irritation (redness, rash, blistering) develops, get medical attention.

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion

IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs. If unconscious, place in recovery position and get medical attention immediately. Do not give anything by mouth to an unconscious person. Get medical attention immediately. Do not wait for symptoms to appear.

Most important symptoms and effects, both acute and delayed	Causes skin irritation. Harmful if inhaled. Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure.
Indication of any immediate medical attention and special treatment needed	If breathing is laboured, oxygen should be administered by qualified personnel. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Notes to a physician:	IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If aspiration is suspected obtain immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media	
Suitable extinguishing media	Foam, Carbon dioxide, Water fog or dry powder.
Unsuitable extinguishing media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	Flammable liquid and vapour. The vapour is heavier than air; beware of pits and confined spaces. Will float and can be reignited on surface water. Decomposes in a fire giving off toxic fumes: A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. If sulphur compounds are present in appreciable amounts, combustion products may include also H2S and SOx (sulfur oxides) or sulfuric acid
Advice for firefighters	Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment. Dike fire control water for later disposal.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Do not ingest. If swallowed then seek immediate medical assistance. Do not use sparking tools. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Avoid exposure during pregnancy.
Methods and material for containment and cleaning up	Provided it is safe to do so, isolate the source of the leak. Use non-sparking equipment when picking up flammable spill. The vapour is heavier than air; beware of pits and confined spaces. Ensure that the equipment is adequately grounded. Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Wear chemical protection suit and breathing apparatus.
Spillages onto land:	In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a lidded container for disposal or recovery. Dispose of this material and its container as hazardous waste **Small spillages:** Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. **Large spillages:** Cover spillage with foam to reduce evaporation. Do not use water jet.
Spillages on water or at sea:	Collect as much as possible in clean container for reuse or disposal. **Small spillages:** Contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. **Large spillages:** Open waters should be contained with floating barriers or other mechanical means and recovered, only if this is strictly necessary and if fire/explosion risks can be adequately prevented. Otherwise control the spreading of the spillage, and let the substance evaporate naturally.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Obtain special instructions before use. Keep away from sources of ignition - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up

by providing adequate ventilation during and after use. Take action to prevent static discharges. Use non-sparking tools. All parts of the plant and equipment should be electrically bonded together and connected to earth. Electrical continuity should be checked at regular intervals. Antistatic clothing and footwear should be used. The vapour is heavier than air; beware of pits and confined spaces. Avoid all contact with substance. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe vapour. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned.

Conditions for safe storage, including any incompatibilities

Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.

Storage temperature: Stable at ambient temperatures.

Incompatible materials: Keep away from oxidising agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Benzene	71-43-2	0.1	0.32	1^	3.2	NIOSH
		1	-	5	-	OSHA
		0.5	-	2.5	-	ACGIH
Naphthalene	91-20-3	10	50	15^	75^	NIOSH
		10	50			OSHA
		10	-	-	-	ACGIH, SK, A3

Note: OSHA PELs 1910.1000 TABLE Z-1/2/3 / NIOSH RELs / ACGIH TLVs
^Ceiling limit value (15 min)
Sk - Can be absorbed through skin.
A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histological type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiological studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

Biological exposure indicies

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Naphthalene	91-20-3	1-Naphthol* + 2-Naphthol*	-	End of shift	Nq, Ns

Source: 2015 ACGIH Biological Exposure Indicies (BEIs)

Note:
Nq: Nonquantitative
Ns: The determinant is nonspecific, since it is also observed after exposure to other chemicals.

Appropriate engineering controls

Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Guarantee that the eye flushing systems and safety showers are located close to the working place.

Individual protection measures, such as personal protective equipment

Fuels are typically used, transferred and transported in closed systems. If exposure is likely (i.e. during sampling) the following advice may be appropriate. Keep good industrial hygiene. Always wash hands before smoking, eating and

drinking. Do not eat, drink or smoke at the work place. Avoid all contact. Do not breathe vapour. Avoid exposure during pregnancy.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye/ face protection

Use eye protection according to EN 166, designed to protect against liquid splashes.

Skin protection

Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.
Recommended: Nitrile rubber.

Body protection: Wear anti-static clothing and shoes.
Small scale: Wear suitable coveralls to prevent exposure to the skin.
Large scale: Chemical protection suit

Respiratory protection

When the product is heated / In case of inadequate ventilation wear respiratory protection. The use of a high efficiency filter (recommended: EN143) is recommended. Filter type A1.

Closed system(s): Not normally required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear to Golden liquid
Odour	Petroleum
Odour threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Initial boiling point and boiling range	266.00 - 716.00 °F (130 - 380 °C)
Flash point	120 > °F (49 > °C) (MIN)
Evaporation rate	Not determined
Flammability (solid, gas)	Not applicable - liquid
Upper/lower flammability or explosive limits	Upper: 6 - 7.5% Lower: 0.6 – 1.3%
Vapour pressure	2.1 - 2.6 MmHg @ 21°C
Vapour density	Not determined
Relative density	Not determined
Solubility(ies)	Not determined
Partition coefficient: n-octanol/water	Not determined
Auto-ignition temperature	465.80 °F (241 °C)
Decomposition temperature	Not determined
Viscosity	1.70 - 3.60 CSt @ 104°F

Other information

Specific Gravity	0.88 @ 15°C
Pour point	-10 - -60 °F (-23.33 - -51.11 °C)

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions Reacts with - Strong oxidising agents
Chemical stability	Stable under normal conditions Hazardous polymerisation will not occur.
Possibility of hazardous reactions	Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Product may release Hydrogen Sulphide.
Conditions to avoid	Elevated temperature: > 50 °C Keep away from heat, sources of ignition and direct sunlight.

Incompatible materials	Keep away from oxidising agents. Strong Acids and Alkalis.
Hazardous decomposition products	A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. Decomposes in a fire giving off toxic fumes: COx, H2S, SOx,

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute toxicity - Inhalation	Acute toxicity, Category 4 (Inhalation): Harmful if inhaled. LC50 (inhalation,rat) mg/l/4h: 4.1 mg/L (OECD 403)
Acute toxicity - Skin contact	Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Skin corrosion/irritation	Skin Corrosion/Irritation, Category 2: Causes skin irritation. Irritating to skin (rabbit) (OECD 404)
Serious eye damage/irritation	Based upon the available data, the classification criteria are not met.
Respiratory or skin sensitisation	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Carcinogen, Category 2: Suspected of causing cancer. EU Harmonised Classification LOAEL: 25 mg/kg bw/day (mouse) (Biles et al. 1988)
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
STOT - single exposure	Based upon the available data, the classification criteria are not met.
STOT - repeated exposure	Specific target organ toxicity — repeated exposure, Category 2: May cause damage to organs through prolonged or repeated exposure. Oral: No data Inhalation: NOAEC: 880 mg/m^3 (rat) Dermal: NOAEL 30 mg/kg bw/day (rat)
Aspiration hazard	Aspiration hazard, Category 1: May be fatal if swallowed and enters airways. Viscosity: ≥1.5 mm²/s @ 40 °C

Information on likely routes of exposure

Inhalation	Possible – accidental exposure
Ingestion	Possible – accidental exposure
Skin contact	Possible – accidental exposure
Eye contact	Unlikely – accidental exposure

Early onset symptoms related to exposure	Causes skin irritation. Harmful if inhaled. May cause damage to organs through prolonged or repeated exposure.
Delayed health effects from exposure	Suspected of causing cancer.
Exposure levels and health effects	See Section: 8
Interactive effects	None known

Other information

OSHA Designated Carcinogen	Not listed
NIOSH Occupational Carcinogen List	Not listed
NTP Report on Carcinogens	Not listed
IARC Monographs	Not listed

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Hazardous to the aquatic environment, Acute, Category 3: Harmful to aquatic life. LL50 96hr (Fish) 21 mg/l (OECD 203) Hazardous to the aquatic environment, Chronic, Category 2: Toxic to aquatic life with long lasting effects. NOEL: 0.083 mg/L (Redman et al. 2010)

Persistence and degradability	Substance is complex UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance
Bioaccumulative potential	Substance is complex UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance
Mobility in soil	Substance is complex UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Dispose of this material and its container as hazardous waste. Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue.

SECTION 14: TRANSPORT INFORMATION

	Road/rail (ADR/RID)	Sea transport (IMDG)	Air (ICAO/IATA)
UN number	UN 1202	UN 1202	UN 1202
UN proper shipping name	DIESEL FUEL	DIESEL FUEL	DIESEL FUEL
Transport hazard class(es)	3	3	3
Packing group	III		
Environmental hazards	Environmentally hazardous substance	Classified as a Marine Pollutant.	Environmentally hazardous substance
Special precautions for user	See Section: 2		
Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal Regulations

TSCA Chemical Data Reporting (CDR) Rule	Listed
NIOSH Occupational Carcinogen List	Not listed
EPCRA Section 313	Not listed
CWA 307- Toxic	Not listed
CERCLA - Hazardous Substances	Not listed
CWA Section 311 List of Hazardous Substances	Not listed

US State Regulations

Proposition 65 (California)	Not listed
Massachusetts, New Jersey, Pennsylvania, Rhode Island- State Right to Know Lists	Not listed
New York -State Right to Know Lists	Not listed
Minnesota - State Right to Know Lists	Not listed
Massachusetts – Toxic Use reduction act	Not listed

Non-Regional

IARC Monographs	Not listed

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. Updated version and date. New format has been issued, all sections have been updated to include new information. Review SDS with care.

Version	4.0
Revision Date	14 April 2021
Date of First Issue	SEP 2015

This Safety Data Sheet was prepared in accordance with US Regulation OSHA HCS (29 CFR 1910.1200)

References:
Existing ECHA registration(s) for Fuel Oil, Residual (CAS No. 68476-33-5)

Literature Sources:

1. Biles, R.W., Mckee, R.H., Lewis, S.C., Scala, R.A., DePass, L.R. 1988. Dermal carcinogenic activity of petroleum-derived middle distillate fuels. Toxicology 53:301-314.
2. Redman, A. et al. 2010. Aquatic Toxicity Predictions Obtained Using the PETROTOX Model for petroleum substances. CONCAWE, Brussels, Belgium.

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200	**Classification procedure**
Flammable Liquid, Category 3	Flash point
Aspiration hazard, Category 1	High percentage inclusion of components with aspiration hazard
Skin Corrosion/Irritation, Category 2	Threshold Calculation
Acute toxicity, Category 4 (Inhalation)	ATE Calculation
Carcinogen, Category 2	Threshold Calculation
Specific target organ toxicity — repeated exposure, Category 2	Threshold Calculation
Hazardous to the aquatic environment, Acute, Category 3	Summation Calculation
Hazardous to the aquatic environment, Chronic, Category 2	Summation Calculation

Legend

ADR/RID	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road / RID: Regulations concerning the international railway transport of dangerous goods
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor (BCF)
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWA	Clean Water Act
EC	European Community
ECHA	European Chemicals Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EN	European Standard
EU	European Union
IARC	International Agency for Research on Cancer
ICAO/IATA	International Civil Aviation Organization / International Air Transport Association
IMDG	IMDG: International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
LTEL	Long term exposure limit
OECD	Organisation for Economic Cooperation and Development
OSHA	The Occupational Safety & Health Administration
STEL	Short term exposure limit
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UN	United Nations
UVCB	Unknown or Variable Composition

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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