



Material Safety Data Sheet Bravo Crude Oil

02	10/011/2021	Revision of crude oil characteristics, considering the new blend Polvo & TBMT.		Heleuza Goncalves	Jefferson Soares Fernando Albuquerque		
01	05/01/2021	Inclusion of flammability and benzene concentration.		Paola Thompson	Heleuza Goncalves Adelci Almeida		
00	18/08/2020	Original		Adelci Almeida	Carlos Leal Adelci Almeida		
VERSÃO	DATA	DESCRIÇÃO			AUTOR	REVISOR	APROVADOR
Controle de Documento	Projeto	Área	Tipo	Sigla	Nº	Nº do Documento	
	TBMT	HSE	Datasheet	SHT	0001	PRIO03-HSE-SHT-0001	

1 - PRODUCT AND COMPANY IDENTIFICATION

Product:	Bravo Crude Oil
Product Use:	Refinery feed stock
Company Identification:	Petrório O&G Exploração e Produção de Petróleo Ltda.
Address	Praia de Botafogo, nº 370/13º floor, Botafogo – RJ – Brazil
Phone:	55-21-3721-3800
Emergency phone:	55-21-3721-2457
Email:	crudeops@petroriosa.com.br
Website:	www.petroriososa.com.br
MSDS creation date:	18/08/20

2 - HAZARDS IDENTIFICATION

GHS Pictograms:**Signal word:** Danger**GHS Class:** Extremely flammable liquid and vapor Category 1.
Aspiration Hazard, Category 1.
Eye Irritant, Category 2.
Specific Target Organ Toxicity, Single Exposure, Category 3.
Specific Target Organ Toxicity, Repeated Exposure, Category 2.
Carcinogen, Category 1B.
Hazardous to the aquatic environment, long-term, chronic, Category 2.**Hazard Statements:** H224 - Extremely flammable liquid and vapour.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
H304 - May be fatal if swallowed and enters airways.
H413 - May cause damage to organs through prolonged or repeated exposure.
H351 - Suspected of causing cancer.
H411 - Toxic to aquatic life with long lasting effects.**Hazards not Otherwise Classified:** May contain or release hydrogen sulfide gas.

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

Skin: Contact with the skin causes irritation. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

3 - COMPOSITION/ INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	AMOUNT
Crude oil	8002-05-9	100 %weight

4 - FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.

Note to Ingestion of this product or subsequent vomiting may result in
Physicians: aspiration of light hydrocarbon liquid, which may cause pneumonitis.

5 - FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FLAMMABLE PROPERTIES: Extremely flammable

Flashpoint: <23 °C (75 °F)

Autoignition: No Data Available

Flammability (Explosive) Lower: No data available

Limits (% by volume in air) Upper: No data available

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space before check the gas concentration and without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

6 - ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities as appropriate or required.

7 - HANDLING AND STORAGE

Precautionary Measures: This material presents a fire hazard. Liquid quickly evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above -10C (15F). Do not get in eyes, on skin, or on clothing. Do not get in eyes. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, 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. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed

of properly.

8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:	Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.
ENGINEERING CONTROLS:	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.
Eye/Face Protection:	Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection:	Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Viton, Polyvinyl Alcohol (PVA) (Note: Avoid contact with water. PVA deteriorates in water.)
Respiratory Protection:	Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection. Consult local authorities for appropriate values.

9 - PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Amber to Black

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Physical State:	Liquid
Odor:	Petroleum odor
pH:	Not Applicable
Vapor Pressure:	No data available
Vapor Density (Air = 1):	No data available
Boiling Point:	No Data Available
Solubility:	Soluble in hydrocarbon solvents; insoluble in water.
Freezing Point:	No Data Available
Density	0,9384 g/ml @ 15°C (60 °F)
API Gravity:	19,1 @ 15°C (60°F)
Kinematic Viscosity:	164,3 mm ² /s @ 40°C (104°F)

10 - STABILITY AND REACTIVITY

Chemical Stability:	This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility with Other Materials:	May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products:	None known (None expected)
Hazardous Polymerization:	Hazardous polymerization will not occur.

11 - TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation:	The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation:	The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization:	The skin sensitization hazard is based on evaluation of data for similar materials or product components.
Acute Dermal Toxicity:	The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity:	The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity:	The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of crude oil in 1989 and concluded that there was limited evidence for the carcinogenicity of crude oil in animals and inadequate evidence for the carcinogenicity of crude oil in humans. The basis for the findings for animals are results from studies in which crudes applied to the skin of lab animals showed benign and malignant skin tumors in some studies, but not in others.

In conformity with ANVISA RDC 252, a benzene concentration analysis was held for TBMT and Polvo Crude Oil. The result (0.01 %Vol.) was below the limit imposed by mentioned legislation. Tests performed in 2020 and 2021 in accordance with ASTM D7900.

12 - ECOLOGICAL INFORMATION

ECOTOXICITY	This material is expected to be harmful to aquatic organisms and may cause long-term adverse effects in the aquatic environment. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.
Ready Biodegradability:	This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

13 - DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

14 - TRANSPORT INFORMATION

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The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: UN1267, PETROLEUM CRUDE OIL, 3, III

IMO/IMDG Shipping Description: UN1267, PETROLEUM CRUDE OIL, 3, III, FLASH POINT SEE TABLE 5

ICAO/IATA Shipping Description: UN1267, PETROLEUM CRUDE OIL, 3, III

15 - REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1

01-2A=IARC Group 2A

01-2B=IARC Group 2B

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

16 - OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE: Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
GHS - Globally Harmonized System of Classification and Labeling of Chemicals.	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the GHS - Globally Harmonized System of Classification and Labeling of Chemicals and NBR 14725 by the PetroRio O&G. Physical and chemical properties was obtained from SGS Analysis Report. Blend Polvo-Tubarão Martelo Crude Oil – Report ID: ST21-08060.001

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.