CITGO Invert FR Fluid

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 3758
Tulsa, OK 74102-3758

MSDS No. 648401001

Revision Date 11/07/2002

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Hazard Rankings

	HMIS	NFPA
Health Hazard	* 1	1
Fire Hazard	0	0
Reactivity	0	0

*** = Chronic Health Hazard**

Protective Equipment

Minimum Recommended
See Section 8 for Details

Emergency Overview

Physical State Liquid.

Color Off-white. **Odor** Mild.

WARNING:
Harmful or Fatal if Swallowed.
Can Cause Liver and Kidney Damage.
Can be absorbed through the skin.
Can cause eye irritation.
Overexposure to vapor can cause temporary blurring of vision.
Material injected into the skin from high-pressure leaks can cause severe injury.
Most damage occurs during the first few hours.
Seek medical attention immediately.
Surgical removal of material may be necessary.
Spills may create a slipping hazard.

SECTION 1: IDENTIFICATION

Trade Name CITGO Invert FR Fluid

Product Number 648401001

CAS Number Mixture.

Product Family Hydraulic oil

Synonyms Fire-resistant hydraulic fluid
CITGO SAP Product Code No.: 648401001

Technical Contact (800) 248-4684

Medical Emergency (918) 495-4700

CHEMTREC Emergency (United States Only) (800) 424-9300

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) Distillates, petroleum, solvent-refined light paraffinic	64741-89-5	40 - 60
2) Water	7732-18-5	40 - 60
3) Distillates, petroleum, solvent-dewaxed heavy paraffinic	64742-65-0	5 - 20
4) Proprietary Ingredients	Proprietary Mixture	1 - 10
5) Ethylene glycol	107-21-1	0 - 2
6) Zinc and Zinc Compounds	54261-67-5	0 - 2

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact. Inhalation.

Signs and Symptoms of Acute Exposure

Inhalation	Short-term harmful health effects are not expected from vapor generated at ambient temperatures. Overexposure to glycol and glycol ether vapors or mists can cause respiratory tract irritation. In general, this effect becomes noticeable with airborne concentrations of approximately 60 ppm. Cough and a burning sensation in the trachea are symptoms of inhalation exposures above 80 ppm. Overexposure to glycols and glycol ethers can cause central nervous system depression. Symptoms include headache, weakness, nausea, vomiting, dizziness, loss of coordination and increased heart rate. Seisures, convulsions, coma and death are possible at extremely high concentrations.
Eye Contact	Mild to moderate eye irritation can result from short-term contact with liquid, mist, or vapor.
Skin Contact	This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin can cause inflammation and swelling. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.
Ingestion	The predominant hazard associated with this product is ingestion of large quantities at a single time. During the first 12 hours, the patient may experience central nervous system effects such as headache, weakness, nausea, dizziness, loss of judgement and coordination. In mild cases, the patient may appear to be drunk but without the breath odor of alcohol. In more severe cases the patient will experience cardiopulmonary symptoms including mild high blood pressure, abnormally fast heartbeat and elevated breathing rate. Convulsions and coma are possible. Kidney complications, including slow or no production of urine may be expected 24 to 72 hours after ingestion. Also, injury to the liver can occur.
Chronic Health Effects Summary	Certain glycols and glycol ethers have been associated with birth defects in laboratory animals at doses which were toxic to the mother. In repeated exposure studies, certain glycols produced skin irritation and severe eye irritation with corneal damage in laboratory animals. Chronic ingestion studies with lower molecular weight glycols resulted in kidney damage with calcium deposits. Also, calcium oxalate crystals were identified in brain tissue of experimental animals. Limited information is available regarding the effects of chronic inhalation of glycol and glycol ethers in humans. Overexposure to vapor, aerosol or mist generated can result in eye and respiratory tract irritation, dizziness and nausea.
Conditions Aggravated by Exposure	Medical conditions aggravated by exposure to this material may include pre-existing skin, liver or kidney disorders.
Target Organs	This material may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes.
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant	X	**Toxic**		**Combustible**		**Explosive**		**Pyrophoric**	
Sensitizer		**Highly Toxic**		**Flammable**		**Oxidizer**		**Water-reactive**	
Corrosive		**Carcinogenic**		**Compressed Gas**		**Organic Peroxide**		**Unstable**	

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.
Eye Contact	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin Contact	Remove contaminated shoes and clothing. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods.
Ingestion	If swallowed, give two glasses of water to drink. Never give anything by mouth to a person who is not fully conscious. Induce vomiting only upon the advise of a physician. Seek medical attention immediately.
Notes to Physician	Ingestion of lower molecular weight glycols have produced an accumulation of glycolate and glyoxalate which form lactate and results in metabolic acidosis, renal failure, heart failure, and pulmonary edema. Kidney insufficiency has been reported after two to three days of ingestion. The kidney failure may be caused by accumulation of calcium oxalate crystals. Crystalluria can be an early sign of glycol poisoning. Carefully consider the decision to induce or not to induce emesis in ingestions. Measures to decrease absorption may be useful. Avoid induction of emesis if the patient has signs of esophageal or gastrointestinal tract irritation or burns, or has evidence of a decreased sensorium, a depressed gag reflex, or impending shock. In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal.

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification	Not applicable.		
Flash Point Method	Not applicable.		
Lower Flammable Limit	No data.	**Upper Flammable Limit**	No data.
Autoignition Temperature	Not applicable.		
Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur, phosphorus, zinc and/or nitrogen.		
Special Properties	This is a non-flammable, aqueous solution. After the water component evaporates, the remaining material will burn.		
Extinguishing Media	Use dry chemical, foam, Carbon Dioxide or water fog.		
Protection of Fire Fighters	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.		

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulation

SECTION 7: HANDLING AND STORAGE

Handling

Avoid contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

Storage

Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

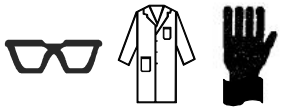
SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



Eye Protection

Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.

Hand Protection

Use gloves constructed of glycol-resistant materials such as butyl rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.

Body Protection

Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.

Respiratory Protection Airborne concentration will determine the level of respiratiory protection required. Respiratory protection is normally not required unless the product is heated or misted. For known or anticipated vapor or mist concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter if adequate protection is provided. For unknown vapor concentrations or concentrations exceeding respirator protection factors, use a positive-pressure, pressure-demand, self-contained breathing apparatus (SCBA). Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

General Comments Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

Occupational Exposure Guidelines

Substance	**Applicable Workplace Exposure Levels**
1) Oil Mist, Mineral	**ACGIH (United States).** TWA: 5 mg/m^3 STEL: 10 mg/m^3 **OSHA (United States).** TWA: 5 mg/m^3
2) Ethylene glycol	**ACGIH (United States).** CEIL: 100 mg/m^3 Form: Aerosol only

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State Liquid. **Color** Off-white. **Odor** Mild.

Specific Gravity 0.92 (Water = 1) **pH** 9.4 **Vapor Density** >1 (Air = 1)

Boiling Point/Range Not available. **Melting/Freezing Point** -30°C (-22°F)

Vapor Pressure <0.01 kPa (<0.1 mmHg) (at 20°C) **Viscosity (cSt @ 40°C)** 100

Solubility in Water Soluble in cold water. **Volatile Characteristics** Negligible volatility

Additional Properties Gravity, ºAPI (ASTM D287) = 22.3 @ 60º F
Density = 7.7 Lbs/gal.
Viscosity (ASTM D2161) = 500 SUS @ 100º F

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability Stable. **Hazardous Polymerization** Not expected to occur.

Conditions to Avoid Strong oxidizing materials

Materials Incompatibility Strong oxidizers.

Hazardous Decomposition Products No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.

SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Distillates, petroleum, solvent-refined light paraffinic:
ORAL (LD50): Acute: >5000 mg/kg [Rat].
DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Ethylene Glycol:
ORAL (LD50): Acute: 4700 mg/kg [Rat]. 5500 mg/kg [Mouse].

Distillates, petroleum, solvent-refined light paraffinic:
Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

Ethylene Glycol:
The lowest published oral lethal dose (LDLo) for a human is 398 mg/kg (RTECS, 2000). Also, the estimated lethal oral dose is 1.4 mL/kg or 1.56 g/kg (Clayton & Clayton, 1994; Lewis, 1998). One fatal case study involved ingestion of one-fourth to one-half pint of antifreeze solution. In that case, acute meningoencephalitis followed by anuria resulted in death from renal failure after 12 days (OSHA, 1990). Rats maintained for two years on diets containing 1% and 2% ethylene glycol exhibited shortened life span, calcium oxalate bladder stones, severe renal injury particularly of tubules and centrolobular degeneration of the liver.
Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations. Currently, no information has been identified indicating that ethylene glycol is associated with birth defects in humans.
In vitro and animal mutagenicity studies of ethylene glycol were negative.
In tests on rabbits, splash contact of ethylene glycol to eye resulted in moderate symptoms of discomfort with mild temporary conjunctival reaction. No significant corneal damage was noted.

Hydraulic Oils:
Repeated or prolonged skin contact with certain hydraulic oils can cause mild skin irritation characterized by drying, cracking (dermatitis) or oil acne. Injection under the skin, in muscle or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects, including mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.

Environmental Fate

An environmental fate analysis has not been conducted on this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

SECTION 14: TRANSPORT INFORMATION

DOT Status Not a U.S. Department of Transportation regulated material.

Proper Shipping Name Not regulated.

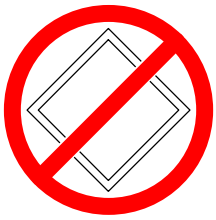
Hazard Class Not regulated.

Packing Group(s) Not applicable.

UN/NA ID Not regulated.

Reportable Quantity A Reportable Quantity (RQ) has not been established for this material.

Placards



Emergency Response Guide No. Not applicable.

HAZMAT STCC No. Not available

MARPOL III Status Not a DOT "Marine Pollutant" per 49 CFR 171.8.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.

SARA 302/304 The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.

SARA 311/312 The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories:

Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard

SARA 313 This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA:
Ethylene Glycol [CAS No.: 107-21-1] Concentration: 0 - 2%
Zinc and Zinc Compounds, Concentration: 0 - 2%

CERCLA The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are:
Ethylene Glycol [CAS No.: 107-21-1] RQ = 5000 lbs. (2268 kg) Concentration: 0 - 2%
Zinc and Zinc Compounds, Concentration: 0 - 2%

CWA This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

California Proposition 65 This product is not known to contain the any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

New Jersey Right-to-Know Label For New Jersey R-T-K labeling requirements, refer to components listed in Section 2.

Additional Regulatory Remarks This product contains low concentrations of Ethylene Glycol. Ethylene Glycol is listed as a Hazardous Air Pollutant (HAP) pursuant to the Clean Air Act Amendments of 1991. Accidental releases of concentrations of Ethylene Glycol above the Reportable Quantity (RQ) must be reported immediately to the National Response Center at (800) 424-8802.

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number	1.0
Revision Date	11/07/2002
Print Date	Printed on 11/07/2002.

ABBREVIATIONS

AP: Approximately EQ: Equal >: Greater Than <: Less Than NA: Not Applicable ND: No Data NE: Not Established

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

IARC: International Agency for Research on Cancer

NTP: National Toxicology Program

NIOSH: National Institute of Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

NPCA: National Paint and Coating Manufacturers Association

HMIS: Hazardous Materials Information System

NFPA: National Fire Protection Association

EPA: US Environmental Protection Agency

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