



NEOFLO™ OLEFINS

Storage & Handling of NEOFLO Olefins

Description:

- NEOFLO linear alpha and internal olefins are high purity hydrocarbons in the C14 to C24 range, with a double bond between two of the carbon atoms. Alpha olefins have the double bond at the first (alpha) position, while internal olefins have the double bond elsewhere within the chain. Produced from ethylene, these olefins are used primarily as synthetic base fluids for oilfield drilling fluids.

Toxicology and Safety

NEOFLO alpha and internal olefins can be used safely when normal industrial handling practices are followed. These higher olefins have shown a relatively low order of toxicity by the routes of exposure (oral, dermal, inhalation).

Headaches, dizziness, and nausea may result from inhalation of air saturated with olefin vapors. Alpha olefins have been shown not to be skin sensitizers. It should be emphasized, however, that like many hydrocarbon liquids, olefins will dry and defat the skin on prolonged contact and will result in skin irritation and dermatitis. Also, like other hydrocarbon solvents of low viscosity and low surface tension, NEOFLO alpha and internal olefins can be dangerous when aspirated into the lungs. When hydrocarbons are ingested, aspiration can occur and lead to chemical pneumonia.

NEOFLO alpha and internal olefins have a low order of acute toxicity potential. Standard practices of good industrial hygiene should be maintained. Any material on the skin and especially in the eyes should be removed immediately by extensive flushing with water to avoid irritation. Repeated or prolonged skin contact should be avoided using barrier creams, impervious gloves and appropriate nonabsorbent clothing. Of course, contaminated clothing should be removed and cleaned before reuse. Eye protection (goggles) should be worn and proper ventilation should be used to prevent inhalation of vapors. Ingestion requires immediate medical attention.

For more information on safe handling, consult the Safety Data Sheet (SDS) for the specific olefin product.

PROTECTIVE EQUIPMENT

	Normal Operations	Spillage
Eye	Chemical monogoggles	Chemical monogoggles
Hand	Wrist length gloves; PVC, neoprene or nitrile rubber; barrier creams.	Gauntlet-type gloves; PVC, neoprene or nitrile rubber.
Foot	Safety shoes or boots; chemical resistant.	Safety boots, rubber, knee length Wellington type.
Body	Standard issue work clothes.	Chemical resistant PVC one-piece suit with hood.
Respiratory protection	If ventilation is not adequate to control below exposure limits, wear a respirator with an organic vapor cartridge.	If spillage occurs in a poorly ventilated area, wear a compressed air line mask or self-contained breathing apparatus.

Fires and Spills

In the unlikely event of an olefin fire, foam, CO₂, dry chemical, water fog or sprays are all suitable for fire control. Do not use a direct stream of water. Material will float and can be re-ignited on the surface of the water. If a spill occurs, immediately remove all sources of ignition to avoid potential fire hazards. If vapor cloud forms, use water fog to suppress or blanket spill area with foam.

Small spills should be removed promptly to avoid potential slippage. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly. Flush area with water to remove trace residue. Contain run-off from residue flush and dispose of properly. Large spills should be diked and vacuumed into a container for disposal, and any remaining residue should be treated as a small spill. All necessary precautions must be taken to prevent olefin spills from entering sewers or public water systems.

NEOFLO Storage Conditions

To protect the quality of NEOFLO alpha and internal olefins and ensure minimal product degradation, nitrogen blanketing of tanks for short- and long-term storage is essential. Storage tanks should be blanketed with high quality (low oxygen content) nitrogen, since olefins react readily with air or oxygen to form peroxides and other oxygenates which may lead to odor formation and color. Blanketing also minimizes the amount of moisture entering a tank. Nitrogen blanketing requires pressure-control devices and pressure-vacuum relief valves.

Antioxidants may be added to NEOFLO alpha and internal olefins in special cases where nitrogen blanketing may not be feasible, or where an added degree of protection is required. Antioxidants such as BHT at levels of 25 to 100 parts per million are recommended. Select an inhibitor only after considering the processing steps to be applied to the NEOFLO alpha or internal olefin and the end-use for the final product.

Trace peroxides in NEOFLO alpha and internal olefins are not expected to represent a hazard, as C14 to C24 peroxides generally decompose slowly, and mainly form carbonyl compounds. Treatment of linear alpha olefins with molecular sieves has been found useful as a polishing treatment for reducing the level of trace peroxides, other oxygenates, and water.

NEOFLO ALPHA and INTERNAL OLEFIN STORAGE and SHIPPING DATA

NEOFLO ALPHA OLEFIN	WEIGHT LB/GAL @ 20°C/68°F	CLASSIFICATION C=Combustible F=Flammable NR=Non-Regulated		RECOMMENDED Product Storage Temperature, °C		RECOMMENDED Maximum Temperature Of Heated Medium, °C	
		DOT	NFPA	Normal	Maximum	Storage	Unloading
2-4	6.44	NR	1,1,0	Ambient	40	65	115
1-6	6.52	NR	1,1,0	Ambient	40	65	115
2-46	6.47	NR	1,1,0	Ambient	40	65	115
2-48	6.49	NR	1,1,0	Ambient	40	65	115
1-68	6.55	NR	1,1,0	Ambient	40	65	115
1-68i	6.55	NR	1,1,0	Ambient	40	65	115
1-58	6.57	NR	1,1,0	Ambient	40	65	115

Temperature

Care should be taken not to exceed the storage temperatures listed above. Overheating may have an adverse effect on the product quality and should be avoided to minimize energy consumption. It is recommended that internal heating coils be fabricated from 316L stainless steel; aluminum may be used as a material of construction for all other applications.

NEOFLO ALPHA and INTERNAL OLEFIN CHEMICAL and PHYSICAL DATA¹

NEODENE ALPHA OLEFIN	DENSITY at 20 °C kg/l	VAPOR PRESSURE Pa at 20°C	VAPOR PRESSURE mm Hg at 38°C	FREEZE POINT °C	BOILING RANGE °C ²	FLASH POINT °C ⁵ Setflash	AVERAGE MOLECULAR WEIGHT g/mol	VISCOSITY CENTIPOISE at 38 °C	SPECIFIC HEAT at 38°C J/kg °C
2-4	0.771	<130	0.05	-14	242-244	105	196	1.5	2210
1-6	0.781	<130	0.005	2	272-274	127	225	2.2	2206
2.46	0.774	<130	0.083 ⁴	-8	242-290	102	206	2.1 ⁴	2213 ⁴
2-48	0.782	<130	<0.05 ⁴	5	241-324	125	230	2.4 ⁴	2209 ⁴
1-68	0.784	<130	<0.005 ⁴	12	270-324	130	238	2.6 ⁴	2209 ⁴
1-68i	0.788	<690	52.75	-4	287-342	141	251	2.7	2064
1-58	0.787	<690	4.65	-12	268-367	135	232	2.4	1943

¹ Physical and chemical data measured on manufacturing plant product and expected to be representative of commercial production.

² Initial boiling point to the temperature at which 90% of the liquid is distilled. ASTM D1078-75.

³ Methods: NEOFLO 2-4 –Tag Closed Cup (TCC) ASTM D56; NEOFLO 1-6, 1-68, 1-68i, 1-58 – PMCC ASTM D93 – Setflash ASTM D3278.

⁴ Blend values calculated from actual physical data on monocarbon cuts contained in the blend.

⁵ Pour points are used in the place of Freeze Points for NEOFLO 1-68i and 1-58.

Shelf-Life

Shell does not set a shelf life or expiration date as product quality is affected by storage conditions. If NEOFLO products are stored under nitrogen blanket at the recommended temperatures, they will maintain product quality for an extended period. Samples should be taken periodically and analyzed for water, color and/or peroxides if these properties are critical to end use. Drum and smaller laboratory samples should be stored at ambient temperatures and heated only as needed.

Construction Materials and Equipment

NEOFLO alpha and internal olefins, both single carbon fractions and blends, are known to be compatible with the materials of construction listed below under recommended storage and handling conditions.

CONSTRUCTION MATERIALS and EQUIPMENT

Material	Standard Construction	"Contaminant Free"	Not Recommended
Metals	Mild Steel	Aluminum Stainless steel (304/316)	
Linings		High Bake Phenolics Sigma Phenguard Bisonite Phenalflex 957 Plasite 3066 Carbozinc 11 Lithcote LC-24	
Non-Metals	Hose/Gasket: Teflon (PTFE) Viton Nitrile		Neoprene Buna S Polypropylene Polyethylene

Bulk Transport, North America

Tank Cars

NEOFLO alpha and internal olefins are shipped in modified general-purpose tank cars (DOT 111A). The specifications are described below.

Tank cars for other NEOFLO alpha and internal olefins are of conventional and jumbo sizes, and have the following features:

1. Carbon steel tank unlined.
2. Tank bottom is sloped to center for drainage.
3. Bottom outlet has a steam-jacketed 4" ball valve equipped with a standard American Association of Railroads fitting with 5 1/4" diameter threads.
4. Vapor connection on top has a 1" ball valve.
5. If needed, heating coil is on tank exterior.
6. Fiberglass insulation is at least 4" thick.

If needed, low steam pressure, corresponding to 115°C, should only be used for the short period of time required to heat the product to the desired temperature for tank car unloading.

Tank Trucks

Tank trucks for NEOFLO alpha and internal olefins are constructed of either aluminum or stainless steel, and normally are 6000-7,000-gallon capacity. The trucks are insulated to conserve the heat introduced at the time of loading and thus maintain the products in a satisfactory fluid state for transfer. For products requiring heating to off-load, stainless steel tank trucks with heating coils will be provided.

Trucks are equipped with pumps, hoses, and fittings for connection to most receiving lines in the 2"-3" range, and quick-coupling type hose connections are commonly used. The flexible hoses furnished generally have polyethylene, butyl rubber, or neoprene liners. When ordering product to be delivered by truck, it is usually advisable to specify the length of the hose required as well as the type and size of the hose connection. Since the pump-off location on trucks varies, allowance for this must be taken into consideration in estimating the hose requirements. Trucks are available with vapor connections for the introduction of inert gas into the truck during discharge. If this is desired, a notation to the effect should be made on the shipping instructions.

Marine

All shore, ship, cargo line, and tanks used to carry NEOFLO alpha and internal olefins by sea must be clean (residual free), dry, odor free, and rust free, with good gaskets and pressure tested steam coils before loading. NEOFLO alpha and internal olefins can be shipped in tanks of either stainless or coated steel and nitrogen blanket should contain <1000ppm oxygen, unless antioxidant is added. Transit temperature is generally ambient. The maximum temperature of adjacent cargo is 40°C. If product is to be heated, steam coils are to be confirmed leak free. If product is not heated, steam coils are to be drained dry, cleaned, blanked off, and steam source is to be isolated from the tank.

Regulations Affecting Storage, Handling, and Shipping in the US

NEOFLO alpha and internal olefins must be stored and handled in accordance with local and federal regulations. For Hazardous Materials/Dangerous Goods classifications per the US Department of Transportation (DOT), the International Air Transportation Association (IATA) and the International Maritime Dangerous Goods (IMDG) code, please refer to the individual product SDS. Compliance with applicable regulations assures proper product identification, packaging, documentation, storage, and transportation.

Emergency Helpline

For emergency telephone numbers refer to the Safety Data Sheet relevant for your company's country and language.

Shell Warranties

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