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To O. C. Kerfoot, J. J. Hall → *TOT*

From R. A. Winstanley

Date January 4, 1984

Subject Normal Paraffi

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[Signature]
RICHARD A. WINSTANLEY
Senior Technical Sales Representative

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CC: DLM HWH RAK DLW

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Conoco Normal Paraffins

Description:

Conoco normal paraffins are high purity, linear saturated paraffin blends of various molecular weights in the C_{10} - C_{16} carbon range. They are generally colorless, low odor, low viscosity liquids.

Applications:

Chemical Intermediate: Conoco n-paraffins readily undergo the various substitution reactions typical of paraffinic hydrocarbons.

Typical examples and applications of these are:

1. Chlorination to alkyl chlorides for use as alkylating agent for manufacture of linear alkylbenzene detergent alkylate
2. Chlorination to high level of chlorine content for use as flame retardant plasticizers and EP additives
3. Oxidation to alcohols
4. Nitration to nitro-alkanes and amines
5. Sulfoxidation or sulfochlorination for surfactant or plasticizer manufacture
6. Raw material for microbiological oxidation or fermentation processes

Solvent: Conoco n-paraffins find direct applications as solvents in many applications. Their high purity and low level of aromatics, olefins and other reactive types of impurities make them attractive for many food-related applications. All of the Conoco n-paraffin blends qualify as "odorless light petroleum hydrocarbons" as defined in the Code of Federal Regulations.

They may be used in all food and food contact applications which permit this type of solvent; see Code of Federal Regulations, Title 21, Paragraphs 121.1182, 121.2594, 121.2507.

Storage and Handling:

Conoco Paraffin 1012 is classified as combustible liquid and should be shipped in accordance with DOT regulations, Title 49, Sections 173.115 and 173.118.

A "Combustible Liquid" label is required for C_{10} - C_{12} ; see Sections 173.401, 173.541, 173.584 and 177.823. Handling should be in accordance with Department of Labor, Title 29, Section 1910.106.

The other paraffins are nonhazardous and do not have specific DOT shipping regulations. Storage in carbon steel tanks is suitable. Conventional lines, pumps, hoses and fittings are satisfactory for use.

Normal precautions against corrosion of equipment from water leaks or condensation should be taken.

- #1 Except for the combustibility, these products present no handling hazards. Normal, good operating procedures and housekeeping should ensure personnel safety.
- #2 In any event, normal care should be taken to avoid contact with eyes or prolonged contact with skin by the normal paraffins.

THE DATA CONTAINED HEREIN ARE FOR GENERAL INFORMATIONAL PURPOSES ONLY. PLEASE REFER TO THE CONOCO CHEMICALS COMPANY MATERIAL SAFETY DATA SHEET FOR SPECIFIC, COMPLETE INFORMATION REGARDING THIS PRODUCT.

PRECAUTIONS

NORPAR 12, NORPAR 13, and NORPAR 15 are volatile hydrocarbon solvents and their vapors can be ignited, causing explosion or flash fires. They should be kept away from heat, sparks, and open flame. "Empty" solvent containers retain product residues. Do not pressurize, cut, heat, or weld such containers or expose them to flame, since this could cause an explosion, resulting in injury or death.

It is important to note that all three grades reach their auto-ignition temperatures in the laboratory distillation of NORPAR by ASTM Method D 86. Therefore, if the procedure is interrupted, the distillation flask must be cooled before the contents are exposed to air.

Health studies have shown that many petroleum hydrocarbons pose potential human health risks that may vary from person to person. As a precaution, exposure to liquids and vapors of petroleum solvents should be minimized. NORPAR solvents should be used only with adequate ventilation, i.e., with air movement sufficient to prevent build-up of toxic or explosive concentrations of vapor in air. Because of possible inhalation toxicity, it is important to control the concentration of each of the three NORPAR grades in the workplace atmosphere to no more than 300 ppm for an 8-hour day, 40-hour workweek.

Avoid prolonged or repeated contact of liquid solvent with the skin. Prolonged confined skin contact—e.g., inside gloves or under shirt sleeves—can result in severe skin irritation or dermatitis.

For additional health and safety information, consult the Material Safety Data Sheets on NORPAR solvents and the Exxon brochure "Handling Petroleum Solvents".

EXXON COMPANY, U.S.A.

Marketing Technical Services

P.O. Box 2180 Houston, Texas 77001

A Division of Exxon Corporation

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NORPAR is the brand name for a distinctive line of three solvent grades with very high normal paraffin content (~98 mass %) and relatively narrow boiling ranges. Their paraffinic structures and exceptionally high purity combine to yield properties not generally available in hydrocarbon solvents; these include low reactivity, selective solvency, moderate volatility, relatively low viscosity, and mild odor. These and other properties of NORPAR solvents offer significant advantages in a wide range of applications, including:

Aluminum Roll Oils *Coatings*
Proprietary/Specialty Products *Lubricants*
Reaction Diluents

These applications are discussed in the following paragraphs. The distinctive characteristics of NORPAR solvents suggest other possible applications as well, such as extraction processes and the manufacture of printing inks, rubber goods, and defoamers.

APPLICATIONS

Aluminum Roll Oils

The normal paraffinic nature, high purity, and narrow boiling range of NORPAR ideally suit these products for use as roll oils in aluminum rolling mills. Compared with conventional roll oils, NORPAR solvents have demonstrated the following advantages in such applications:

reduced evaporative emissions
reduced usage rates
lower additive treat levels
smaller viscosity increase with increase in pressure
better oxidation stability
lower annealing times and temperatures

Proprietary or Specialty Products

The mild odor, high purity, and inert nature of the NORPAR products well suit them for use in deodorizers, insecticides, bactericides, waterless hand cleaners, and many other household products. The paraffinic structure of NORPAR provides unusually low viscosities and densities, compared to other solvents of the same volatility; this combination of properties should lend itself to the formulation of products with exceptional characteristics. The normal paraffin makeup of NORPAR also is desirable in such applications as low-smoke patio torches and liquid candles.

Reaction Diluents

Used as a reaction diluent in some polymerization reactions, NORPAR offers a number of attractive advantages: low levels of polar compounds and other reactive materials, low (selective) solvency, straight-chain structures, and comparatively low viscosities.

Coatings

The low solvent power, low odor, and relatively low viscosity of NORPAR solvents are highly desirable in many organosol and plastisol formulations. NORPAR can provide low-viscosity dispersions with a high degree of viscosity stability.

Lubricants

The inherent lubricating properties of the NORPAR products suit them for use as penetrating oils and for other uses as light, non-staining lubricants.

FDA COMPLIANCE

The high purity of the NORPAR grades, enhanced by careful selection of feedstocks and stringent processing and testing controls, makes them suitable for use in numerous food-related applications. Such use is strictly controlled by federal Food and Drug Administration (FDA) regulations, which cover the use of substances in food processing and in the manufacture of packaging materials that contact food. The FDA regulations pertaining to NORPAR are listed in the accompanying table. For specialized FDA-permitted uses of NORPAR not listed in the table, please contact the Exxon Sales Representative.

CONFORMITY OF NORPAR GRADES WITH REQUIREMENTS OF FEDERAL FOOD AND DRUG ADMINISTRATION REGULATIONS FOR FOOD-ASSOCIATED APPLICATIONS
A ● indicates that the grade may be used within the limitations of the FDA regulation.

FDA REGULATION	TITLE	NORPAR 12	NORPAR 13	NORPAR 15
21 CFR 175.105	Adhesives	●	●	●
21 CFR 176.180	Components of Paper and Paperboard in Contact with Dry Food	●		●
21 CFR 176.200	Defoaming Agents Used in Coatings	●	●	●
21 CFR 176.210	Defoaming Agents Used in the Manufacture of Paper and Paperboard	●	●	●
21 CFR 177.1200	Cellophane	●	●	●
21 CFR 177.2260	Filters, Resin-Bonded	●	●	●
21 CFR 177.2600	Rubber Articles Intended for Repeated Use	●	●	●
21 CFR 177.2800	Textiles and Textile Fibers	●	●	●
21 CFR 178.3570	Lubricants with Incidental Food Contact	●		●
21 CFR 178.3620(b)	Technical White Mineral Oil	●		●
21 CFR 178.3650	Odorless Light Petroleum Hydrocarbons	●		●
21 CFR 178.3800	Preservatives for Wood	●		
21 CFR 178.3910	Surface Lubricants Used in the Manufacture of Metallic Articles			
§ 178.3910(a)(4)	for Rolling Foil and Sheet Stock	●	●	●
§ 178.3910(b)	for Drawing, Stamping, and Forming	●		●
21 CFR 178.45	Packaging Materials for Use During the Irradiation of Packaged Foods	●		●
21 CFR 573.680	Mineral Oil—As a Food Additive Permitted in Feed and Drinking Water of Animals (e.g., Feed Dust Control and Pelletizing Aid)	●		●
21 CFR 573.740	Odorless Light Petroleum Hydrocarbons (for Pesticide Formulations Used in Animal Feeds)	●		●