UCON Fluids and Lubricants

UCON Food Grade Lubricant 220 for the Aluminum Industry

Product Description

UCON™ Food Grade Lubricant 220 is a fully-formulated, extreme-pressure synthetic lubricant specifically developed for use in industrial machinery, especially machinery used in the manufacture of aluminum foil for the food industry. FGL-220 is formulated to provide extreme-pressure performances similar to those found in commonly used sulfur- and phosphate-containing EP gear lubricants.

UCON Food Grade Lubricant 220 offers significantly improved performance over food-grade white oils and non-food-grade-rated petroleum oils by providing excellent lubricity, increased oxidative and thermal stability, a high viscosity index (206), and a low pour point (-33°C).

The components of UCON Food Grade Lubricant 220 are identified in FDA Regulation 21 CFR 178.3570(a), permitting use as components of lubricants in food processing and packaging machinery where incidental food contact may occur. These lubricants also have H1 status for use on food processing and packaging equipment under NSF for Proprietary Substances and Non-Food Compounds.

UCON Food Grade Lubricant 220 also meets the requirements of FDA Indirect Food Additive Regulation 21 CFR 178.3910 for use in surface lubricants used in the manufacture of metallic articles such as foil and sheet stock, provided that the total residual lubricant remaining on the metallic article in the form in which it contacts food does not exceed 0.015 mg/in^2 of metallic food contact surface.

Features and Benefits

Low-Stain Characteristics

The low-stain characteristics of UCON Food Grade Lubricant 220 allows for longer intervals between mill sump changes caused by mechanical lubricant contamination, thereby reducing rolling fluid costs, as well as disposal costs. Typically the stain characteristics found with FGL 220 has been to be as high as 20 – 30% in the rolling fluid before it is equivalent to the staining tendency of only 1% petroleum based lubricant.

Free Unwinding

Aluminum rolled within acceptable contamination limits and then annealed has shown no evidence of tearouts or strip breaks due to residue and is considered “free unwinding”. Aluminum mills have been able to eliminate strip breaks due to lubricant contamination of rolling fluids.

Universal Lubricant

UCON Food Grade Lubricant 220 has been considered a universal mechanical lubricant for mill hydraulics gear drive systems back-up and work roll bearings. This reduces lubrication storage costs and minimizes potential use of the “wrong” lubricant. See applications below.

Special Applications

UCON Food Grade Lubricant 220 can be blended with the coolant or rolling fluid to produce a hydraulic fluid that meets the viscosity requirements of the hydraulic system manufacturer.

Applications

Hydraulics

UCON Food Grade Lubricant 220 can be formulated with rolling fluids to meet the viscosity requirements of pump and valve manufacturers. Excellent results have been obtained on low- and high-pressure hydraulic systems using gear or piston pumps and a lapped or packed spool valves. UCON Food Grade Lubricant 220 blends also meet the stringent requirements for use in hydraulic roll-force and counter-balance systems.

Bearings

UCON Food Grade Lubricant 220 has demonstrated excellent load-carrying ability and extended life for workroll and back-up bearings. Excellent results have been exhibited for anti-friction ball and roller bearings using oil mist or recirculating oil lubrication systems.

Gears

UCON Food Grade Lubricant 220 can be used in all types of gearboxes ranging from fractional to high-horsepower rolling mill drives. It possesses superior operating characteristics, therefore providing reduced operating temperatures, reduced friction, and very little wear. The excellent thermal and oxidative stability of UCON Food Grade Lubricant 220 eliminates the need for frequent changeover due to premature oxidation.

Aluminum Rolling

- Ball and roller bearings, all series, with recirculating oil systems
- Ball and roller bearings, all series, with oil mist systems. (Approved by Timken for use with TQO Bearings.)
- Babbitted back-up roll journal bearings, with recirculating oil systems
- Mechanical screw-down gear drives, with sump systems
- All unwind and rewind gearbox drives and main mill drive pinion stands with recirculating or sump systems. (Check manufacturer's recommendation for users specific operating conditions.)
- Overhead bridge crane gear drives with sump systems
- Separator rewind drive bearings with oil mist systems. (Approved by Schmutz International for their machines.)
- Separator unwind gearbox drives with sump systems. (Approvede by Schmutz International for their machines.)

Viscosity Ratings of UCON Food Grade Lubricant 220 vs Petroleum Lubricant AGMA Ratings

Due to the high viscosity index exhibited by UCON Food Grade Lubricant 220 (206 vs. 90-100 for most petroleum gear lubricants), it is not classified by a single AGMA viscosity rating. UCON Food Grade Lubricant 220 will effectively span two or three AGMA petroleum lubricants ratings over the operating range ofmost gear-boxes. UCON Food Grade Lubricant 220 is equivalent to AGMA grades 5 to 7.

Compatibility with Elastomers

UCON Food Grade Lubricant 220 is suitable for use with most elastomeric materials used in seals and gaskets. Below is a partial list of elastomers that are compatible with UCON Food Grade Lubricant 220.

Viton	Butyl Rubber	Natural Red Rubber
Kalrez	Buna N	Natural Gum Rubber
Silicone	Hycar	Neoprene
Polysulfide	Fluoraz	Hypalon
EPR	Natural Black Rubber	Aflas
EPDM		Teflon

In selective tests, UCON Food Grade Lubricants 220 has been shown to be compatible with silicone rubber 732 RTV and Loctite PST and 290 in direct lubricant contact, and in exposure to the sealants between bonded copper surfaces.

Typical Physical Properties*

Property	UCON Food Grade Lubricant 220
Weight per Gallon, lb	
at 60°F (15.6°C)	8.38
at 68°F (20°C)	8.35
Specific Gravity, 2020°C	1.004
Viscosity, cSt	
at 100°F (37.8°C)	285
at 210°F (98.9°C)	40.7
Viscosity Index	206
Pour Point, °F (°C)	-27 (-33)
Flash Point, ASTM D 93, °F (°C)	405 (207)
Coefficient of Expansion at 55°C, per °C	0.00081

*Typical properties, not to be construed as specifications

Performance Properties†

Property	UCON Food Grade Lubricant 220
Additives	
Rust inhibitor	Yes
Oxidation Inhibitor	Yes
Extreme Pressure	Yes
Turbine Oil Test, ASTM D 665A	Pass
Copper Corrosion, ASTM D 130	No Effect
Babbit Corrosion (89 Sn/7.5 Sb/3.5 Cu)	No Effect
Mist Test	Pass
FZG Spur Gear Test, Stages Passed (12 max)	12
Shell Four Ball Wear Test, ASTM D 2266, Scar Diameter, mm	0.38
Timken Test, lb	
OK Load	45
Score	50

†These data are representative of typical production lots

Storage and Handling

UCON Food Grade Lubricant 220 is a stable, non-corrosive material that can be stored in carbon steel tanks. Heated storage tanks can be employed if outside storage is to be installed. A number of heating methods and media can be used. Either hot water or low-pressure steam (15 psig or less) can be used in external heat transfer panels or internal coils. Electrical heating by means of heating tape or cable is also satisfactory. Heated tanks and piping should be completely insulated. The expense of heating and insulation is often avoided by installing tanks and piping inside a warm building.

UCON Food Grade Lubricant 220 will soften and life many industrial coatings. Preferably, they should contact no coatings and be sorted in clean carbon steel tanks. If coatings cannot be removed, be sure to clean all filters and strainers frequently, especially during the initial period of use.

UCON Food Grade Lubricant 220 is slightly miscible with petroleum-based lubricants. Tanks previously used for petroleum products should be flushed clean before UCON Food Grade Lubricant 220 is introduced.

FGL 220 is only slightly hygroscopic in nature. If moisture content is critical, precautions should be taken to prevent atmospheric moisture form entering the storage tank. A desiccant unit can be installed on the vent line, or the tank can be blanketed with dry air or nitrogen.

Where viscosities in excess of 500 cSt are to be handled, a rotary or gear pump is preferable. Transfer lines should be carbon steel and should be of a size adequate to handle the desired flow and viscosity with a reasonable pressure drop in the line. A three-inch line should be provided for unloading of bulk shipments.

Product Stewardship

Dow encourages its customers and potential users to review their applications from the standpoint of human health and environmental aspects. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel will assist customers in dealing with environmental and product safety considerations. Dow literature, including Material Safety Data Sheets, should be consulted prior to the use.

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