Shell Irus Fluids DU

High performance less flammable hydraulic fluids

Shell Irus Fluids DU are advanced, synthetic, anhydrous less flammable hydraulic fluids based on organic esters and proven additives. These ISO Class HFDU fluids are specially designed to provide good performance in conventional hydraulic systems and have better fire resistance than mineral oils. They are also biodegradable with a low ecotoxicity, and are particularly suited for use in environmentally sensitive areas.

Applications

- ***Typical applications for Irus DU are to be found in the tunnel boring, metal, mining and glass industries. Irus Fluids can replace mineral oils in hydraulic installations to provide good lubrication and a higher degree of fire resistance.***

Performance Features and Benefits

- *Lower flammability than mineral oils.*
- *Readily biodegradable - biodegraded by >60% after 28 days when tested in OECD 301 B (CO_2 evolution test).*
- Low ecotoxicity - 'not harmful' to plants (algae), invertebrates (Daphnia sp.) and fish; EL_{50}/LL_{50} >100 mg/l when tested as water-accommodated fractions in OECD 201, OECD 202 and OECD 203.
- *Excellent viscosity/temperature characteristics - minimum change of viscosity with variation in operating temperature, giving true 'multigrade' characteristics.*
- *Pump anti-wear protection similar to mineral hydraulic oils.*
- *Low flammability maintained during the life of the fluid.*
- *Excellent corrosion protection.*
- *Compatible with most materials specified for use with mineral oils.*

Specification and Approvals

Irus DU meets the requirements of:

Classification HFDU according to ISO 6743-4

ISO 12922 Specifications for fire-resistant hydraulic fluids - category HFDU

The European Communities Mines Safety Commission 7th Report - Requirements for less flammable fluids ('7th Luxembourg Report').

Irus Fluid DU is approved by:

Eaton for Industrial and mobile hydraulic systems according to Brochure 694 requirements.

Change-over Procedure

In order to achieve maximum benefits from the use of Irus DU, it is necessary to completely drain all mineral oil from the hydraulic circuit prior to filling with fresh fluid. A detailed change-over procedure can be obtained from your Shell representative.

Storage

Drums must be kept sealed in weatherproof conditions, in order to prevent contamination by water or dust.

Seal Compatibility

Irus DU are compatible with seal and paint materials normally specified for use with mineral oils, except those made from natural rubber. More details are given in the attached "Typical Physical Characteristics" table.

Advice

Advice on applications not covered in this leaflet may be obtained from your Shell representative.

Health and Safety

Guidance on Health and Safety are available on the appropriate Material Safety Data Sheet which can be obtained from your Shell representative.

Protect the environment

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Typical Physical Characteristics

Irus Fluid			**DU 46**	**DU 68**
ISO Viscosity Grade		ISO 3448	46	68
ISO Fluid Type		ISO 6743-4	HFDU	HFDU
Kinematic Viscosity				
at -20°C	mm^2/s	ISO 3104	1839	2552
at 40°C	mm^2/s	ISO 3104	48.7	71.4
at 100°C	mm^2/s	ISO 3104	9.6	13.6
Viscosity index		ISO 2909	187	197
Acid number	mgKOH/g	ISO 6618	1.14	1.16
Density at 20 °C	kg/m^3	IP 365	923	923
Pour point	°C	ISO 3016	-36	-30
Foaming characteristics		IP 146		
Sequence I Tendency/Stability at 24°C		ASTM D 892	0/0	0/0
Sequence II Tendency/Stability at 93,5°C			0/0	0/0
Sequence III Tendency/ Stability after test at 93,5°C, ml at 24°C			0/0	0/0
Air release at 50 °C		ISO 9120	4	14
Load Carrying Capacity		ISO 14635-1		
FZG Gear Machine - Pass Stage			10	10
Compatibility - with elastomers				
NBR 2, CR, FPM, AU and PTFE			Compatible	Compatible
NBR 1, EPDM and IR			Not Compatible	Not Compatible
Flash point (COC)	°C	ISO 2592	320	312
Fire point	°C	ISO 2592	348	330
Auto-ignition temperature	°C	ASTM E 659	> 400	> 400

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.