UCON™ Trident™ AW Hydraulic Fluids

Product Description

UCON™ Trident™ AW Hydraulic Fluids are high performance hydraulic fluids designed for demanding industrial applications requiring environmental sensitivity, water solubility, fire resistance, and excellent anti-wear properties over wide temperature ranges. These polyalkylene glycol (PAG) based fluids, which are available in three viscosity grades, are anhydrous (water-free) and are rated as antiwear. UCON™ Trident™ AW Hydraulic Fluids do not break down to form sludge, and they do not hydrolyze in the presence of water. Furthermore, because of their high viscosity indices and excellent low temperature characteristics, one UCON™ Trident™ viscosity grade fluid may replace two or three viscosity grade mineral oils. These hydraulic fluids are ideal for use in applications such as dockside/marine, forestry, amusement, and industrial operations.

Features and Benefits

Excellent Anti-Wear Performance – UCON™ Trident™ AW Hydraulic Fluids have demonstrated exceptional load-carrying capabilities and are specially formulated (with no zinc or other metal additives) to provide effective corrosion protection and anti-wear performance in hydraulic systems. They are rated as anti-wear (AW) fluids according to ASTM D7043 testing and FZG testing. All of which means the potential for greater operating reliability, less downtime, and lower maintenance costs.

Clean, Long Lasting Operation – When proper fluid and equipment maintenance procedures are followed, UCON™ Trident™ AW Hydraulic Fluids do not form sludge or varnish. They offer a longer service life with better operating reliability, lower maintenance costs, and reduced overall downtime. Because UCON™ Trident™ Fluids are water-soluble, shop and equipment cleanup is easier than the cleanup of conventional oil fluids.

Fire Resistance – High flash and fire points provide safety in applications calling for fire resistant fluids, thus providing operating confidence and potentially reduced insurance costs. FM Approvals, using the latest test procedures, has classified UCON™ Trident™ 46 AW and 68 AW Hydraulic Fluids as "Approved Industrial Fluids", and UCON™ Trident™ 32 AW as a specification tested material†.

All Season Performance – UCON™ Trident™ AW Hydraulic Fluids have high viscosity indices and low pour points, allowing year round usage and eliminating seasonal changeovers. One UCON™ Trident™ Fluid can replace two or three viscosity grade oils, thereby reducing seasonal fluid purchase and disposal costs, lowering maintenance costs, and requiring less downtime.

† FM Approvals, Test Standard for Flammability of Industrial Fluids, Class Number 6930, January 2002.

UCON™ hydraulic fluids

Features and Benefits

Biodegradability – UCON™ Trident™ 32, 46 and 68 AW Hydraulic Fluids are readily biodegradable according to OECD 301F.

Aquatic Toxicity – UCON™ Trident™ AW Hydraulic Fluids is "Practically Non-Toxic" to fish and other aquatic wildlife according to the U.S. Fish and Wildlife Service hazard classification.

High Waste Treatability – UCON™ Trident™ Hydraulic Fluids are *highly waste-treatable.* In tests simulating the discharge of industrial waste streams to unacclimated municipal treatment plants (POTWs), UCON™ Trident™ 32 AW Hydraulic Fluid demonstrated no adverse impact on either the proper functioning or performance of the waste treatment systems, even at high discharge levels.

Typical Properties

	UCON™ Trident™ AW Hydraulic Fluid			
	32	**46**	**68**	**Test Method**
Performance Properties				
FZG Visual Gear Test, Stages Passed	12	12	12	ASTM D5182
Four Ball Anti-Wear				ASTM D4172
40 kg, 1200 rpm, 1 hr @ 75°C				
(mm wear scar)	0.79	0.81	0.81	
Four Ball EP Test				ASTM D2783
Load Wear Index	32.94	33.10	33.26	
Last Non-seizure, 80 kg (mm scar)	0.40	0.40	0.39	
Last Seizure, 126 kg (mm scar)	2.75	2.60	2.53	
Weld Load, kg	160	160	160	
V104 Vane Pump Test (total mg wear)	<10	<10	<10	ASTM D7043
35 VQ Vickers Vane Pump Test[1]	Pass	–	–	M-2950-S
Individual Cartridge Wear, mg	8, 8, 8	–	–	
Average Wear, mg	8	–	–	
Sonic Shear Stability				
initial viscosity @ 40°C (cSt)	36.81	47.06	68.92	ASTM D5621
irradiated viscosity @ 40°C (cSt)	36.85	47.01	69.20	ASTM D5621
Viscosity Properties				
Viscosity @ 40°C (cSt)	37.3	47.0	68.4	ASTM D445
Viscosity @ 100°C (cSt)	8.0	9.8	13.7	ASTM D445
Viscosity @ 0°C (cSt)	294	390	614	ASTM D445
Viscosity Index	194	200	209	ASTM D2270

[1] Southwest Research

Typical Properties (cont'd)

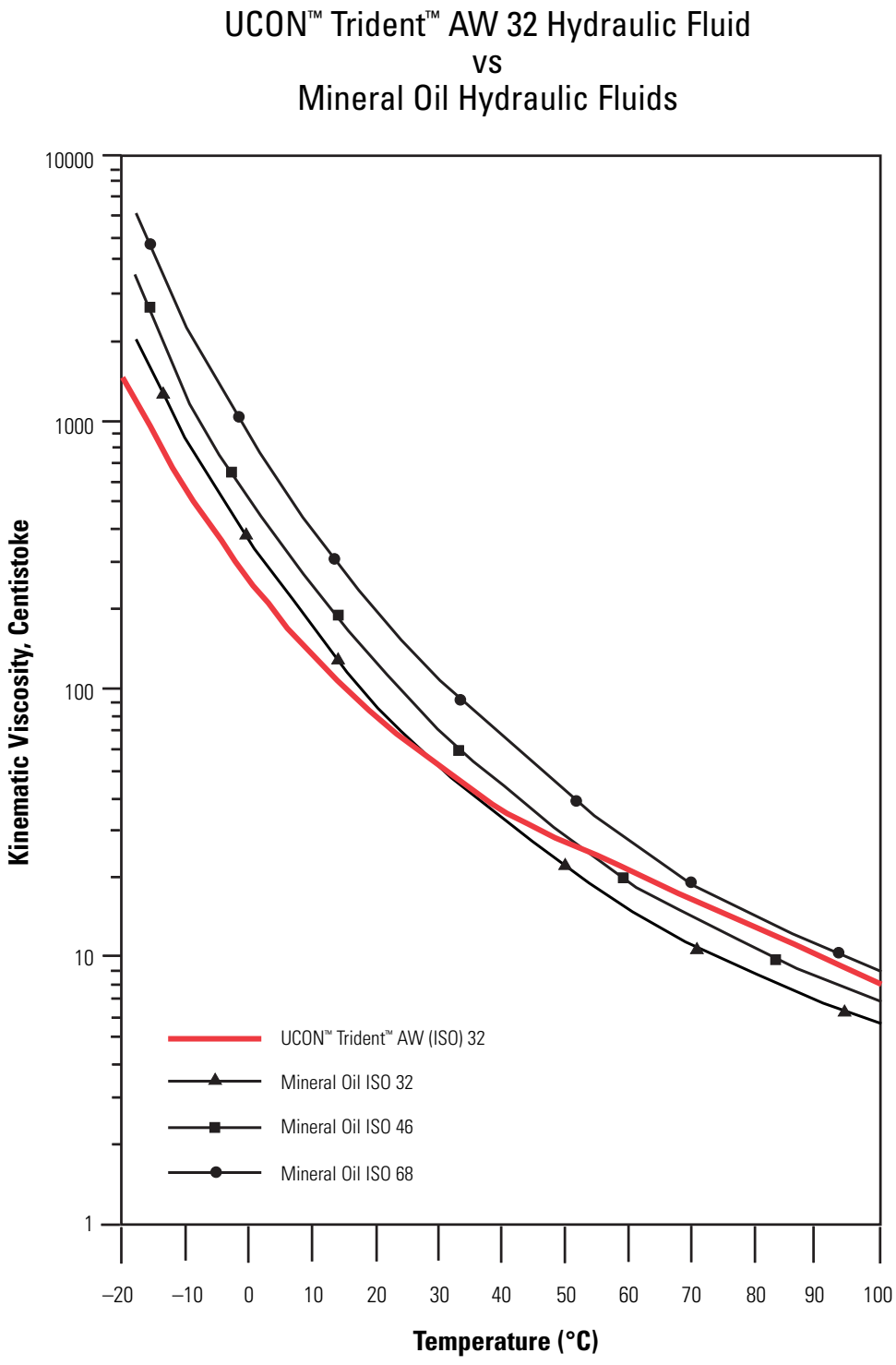
	UCON™ Trident™ AW Hydraulic Fluid			
	32	46	68	Test Method
Fire Properties				
Flash Point– Cleveland Open Cup, °C	284	300	306	ASTM D92
Flash Point– Pensky Martens Closed Cup, °C	>191	None[1]	None[1]	ASTM D93
Fire Point, °C	304	316	322	ASTM D92
FM Approvals[2]	Spec Tested	Approved	Approved	Test Standard 6930
Physical-Chemical Properties				
Specific Gravity @ 20°C	1.028	1.031	1.037	ASTM D1298
Foam Test –				ASTM D892
Sequence I, initial volume/ml	10/0	10/0	10/0	
Sequence II, initial volume/ml	10/0	10/0	10/0	
Sequence III, initial volume/ml	10/0	10/0	10/0	
Vapor Pressure (mm Hg)	<0.01	<0.01	<0.01	ASTM E1719
Specific Heat (Cal/g/°C)	0.476	0.481	0.478	ASTM E1269
Pour Point, °C	-51	-48	-48	ASTM D97
Ash Content (%)	0.011	0.008	0.008	ASTM D482
Corrosion Protection (TORT)	Pass	Pass	Pass	ASTM D665A
Copper Strip Corrosion	1b, shiny	1a, shiny	1a, shiny	ISO 2160
Aging Behavior (Hrs)				DIN 51587
mg KOH/g	1.14	0.92	0.31	
Hours	1,008	1,008	1,008	
Coefficient of Expansion				ASTM D1903
@ 20°C (°C)	0.00078	0.00080	0.00079	
@ 55°C (°C)	0.00080	0.00078	0.00078	
Weight, lbs/gal. (20°C)	8.58	8.60	8.66	

[1] No flash observed

[2] FM Approvals, Test Standard for Flammability of Industrial Fluids, Class Number 6930, January 2002

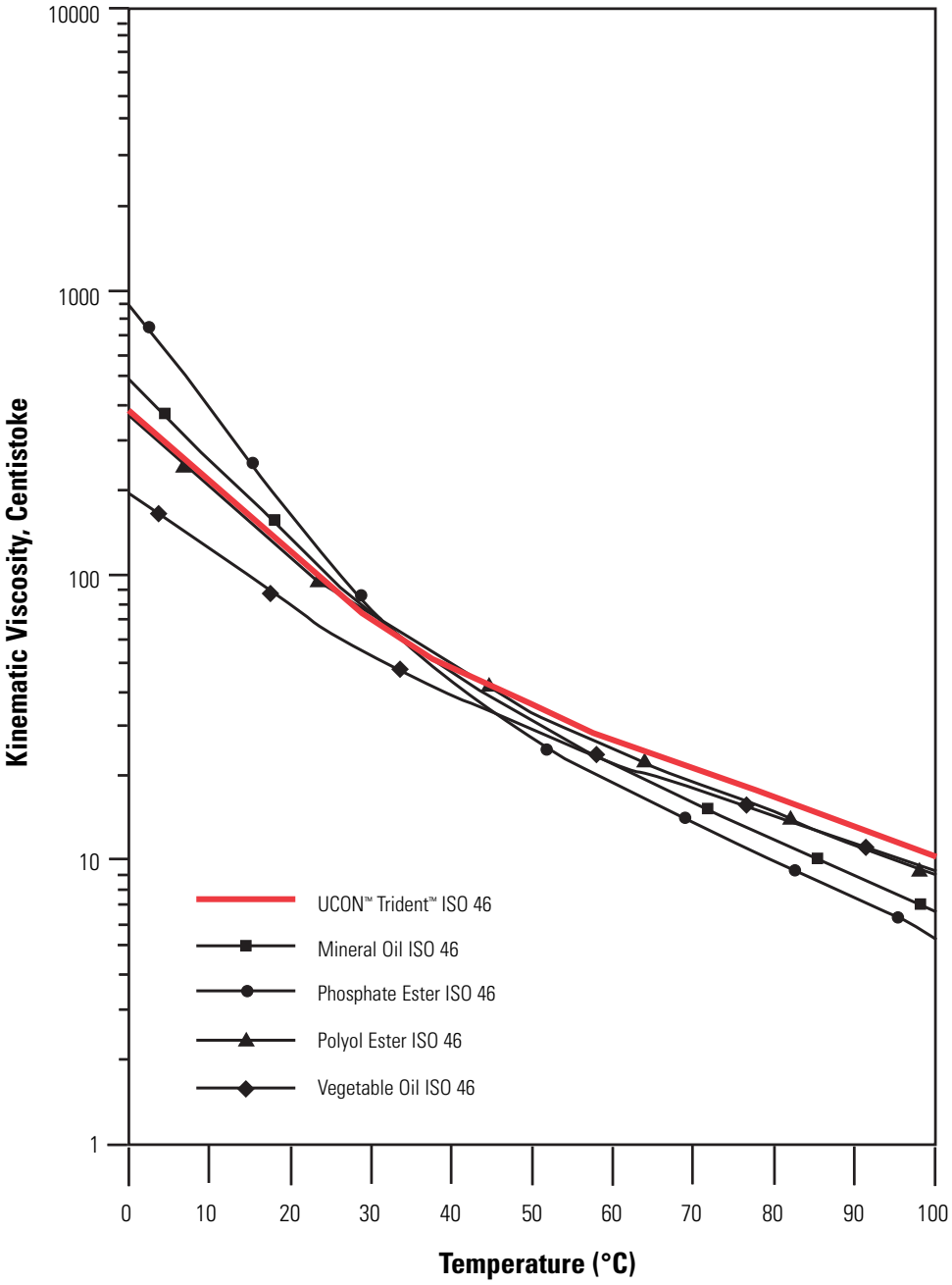
Viscosity Grade Selection

The following graphs can be used to assist in selection of the appropriate fluid viscosity grade given the hydraulic system operating temperature. They also illustrate that UCON™ Trident™ Fluids have a higher viscosity index (flatter curve) than some other classes of fluids, and thus, that one UCON™ Trident™ Fluid may replace two or three oil viscosity grades.



Viscosity Grade Selection (cont'd)

UCON™ Trident™ AW 46 Hydraulic Fluid
vs
Various ISO 46 Fluids



Hydraulic System Conversion

For best results when converting to a UCON™ Trident™ AW Hydraulic Fluid, ensure the following:

- the hydraulic system is thoroughly clean and free of contamination from previous fluids
- oil filters are new
- paint, plastics, seals and elastomers are compatible
- standard industry procedures are followed

Conversion to a UCON™ Trident™ Hydraulic Fluid

Installation of UCON™ Trident™ Hydraulic Fluid into systems that previously contained petroleum-based hydraulic fluid should follow the recommended flush procedure below:

- Drain previous fluid from the equipment.
- Replace fluid filters.
- Fill the system with the UCON™ Trident™ Fluid to be used. Run or circulate under minimum load for 24 hours. UCON™ Trident™ Fluid will generally clean varnish and sludge build-up formed from petroleum-based hydraulic fluids.
- Thoroughly drain the UCON™ Trident™ Fluid from the system while still warm.
- Inspect the fluid filters and replace as needed.
- Fill the equipment with fresh UCON™ Trident™ Fluid and begin normal operation.
- Inspect and change filters as required.

Contact your technical representative for assistance and detailed information on conversion procedures.

Compatibility

Other Hydraulic Fluids – UCON™ Trident™ AW Hydraulic Fluids are not compatible with other hydraulic fluids. As with any fluid conversion, recognized industry procedures including system cleanup and flushing should be followed.

Paints – PAG-based fluids show some solvency for common oil-based paints but minimal solvency for many epoxy-based paints. If interior surfaces of hydraulic system components are painted, it may still be possible to convert to a PAG fluid. Extra care should be taken to ensure that lifted paint trapped by the filter does not cause the pump to be starved of lubricant. Following the conversion, the painted surfaces should be carefully monitored for trends toward paint softening, lifting, and peeling. If paint removal does occur, frequent cleaning or replacement of filters may be required until the paint is completely removed.

Elastomers – UCON™ Trident™ AW Hydraulic Fluids are suitable for use with many elastomeric materials used in seals and gaskets. Below is a partial list of compatible elastomers:

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

Because of the variations that can exist between elastomers in the same generic family, it is important to test the compatibility of specific elastomers that are to be used in a critical application.

Plastics – Compatibility should be assessed for any plastic components (such as reservoir sight glasses) exposed to a hydraulic fluid.

	25°C	**100°C**
Polypropylene	Recommended	Recommended
Polyethylene, Low Density	Recommended	Not Recommended
Homalite Polycarbonate	Not Recommended	Not Recommended
Lucite/Plexiglas Polymethylmethacrylate	Not Recommended	Not Recommended
Polyurethane	Not Recommended	Not Recommended

Because of the variations that can exist between plastics in the same generic family, it is important to test the compatibility of specific elastomers that are to be used in a critical application.

Regulatory and Disposal

Requirements for reporting accidental fluid spills and discharges may vary from state to state and from municipality to municipality. It is important that you contact the appropriate authorities in your local area to clearly understand any reporting or other requirements.

Consult local sewage treatment plant authorities for regulations prior to disposing of any product. For guidance, contact your local Water Board, regional office of the Environmental Protection Agency, or appropriate regulatory authority.

Product Safety

When considering the use of any Dow products in a particular application, you should review our latest Material Safety Data Sheets and ensure that the use you intend can be accomplished safely. For Material Safety Data Sheets and other product safety information, contact Dow at the number for your area, listed on the back of this brochure. Before handling any other products mentioned in the text, you should obtain available product safety information and take necessary steps to ensure safety of use.

No chemical should be used as or in a food, drug, medical device, or cosmetic, or in a product or process in which it may contact a food, drug, medical device, or cosmetic until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations.

Dow requests that the customer read, understand, and comply with the information contained in this publication and the current Material Safety Data Sheet(s). The customer should furnish the information in this publication to its employees, contractors, and customers, or any other users of the product(s), and request that they do the same.

Emergency Service

Dow maintains a 24-hour emergency service for its products.The American Chemistry Council (CHEMTREC) and Transport Canada (CANUTEC) also maintain 24-hour emergency service:

Location	Dow Products	All Chemical Products (in case of emergency)
United States and Puerto Rico	800-DOW CHEM	Phone CHEMTREC: 800-424-9300
Canada	519-339-3711 (collect)	Phone CANUTEC: 613-996-6666 (collect)
Europe Middle East North and Central Africa	49 41 469 12333	
Latin America, Asia/Pacific, South Africa, and any other location worldwide	Phone United States: 989-636-4400	

At sea, radio U.S. Coast Guard, who can directly contact Dow…800-DOW CHEM or CHEMTREC…800-424-9300.

DO NOT WAIT. Phone if in doubt.
You will be referred to a specialist for advice.

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To learn more, contact

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