

#### Lubricant Additives Business

#### **Reolube<sup>®</sup> Turbofluid 46XC**

Fire Resistant Hydraulic Fluid

#### DESCRIPTION

Reolube<sup>®</sup> Turbofluid 46XC is a high performance, fire-resistant hydraulic fluid designed for use in electrohydraulic governor control systems of steam turbines, including systems using fine tolerance servo valves. It is a triaryl phosphate based on synthetic butylated phenol and is formulated to provide good oxidation stability. Physical properties such as air release, foaming and demulsibility are also carefully controlled within turbine manufacturers ' specified limits.

Reolube® Turbofluid 46XC is also recommended for use as a fire-resistant lubricant, for example in steam and gas turbines.

Reolube® Turbofluid 46XC is approved by major OEMs such as General Electric, Siemens and Alstom and is approved by FM Global against Standard 6930 for 'Less flammable hydraulic fluids'. It also meets the requirements of ISO Standard 12922 and ASTM D4293 for HFDR-type fire-resistant hydraulic fluids.

The values given in the tables are typical and do not constitute specification limits.

#### PHYSICAL PROPERTY UNIT **TYPICAL VALUE TEST METHOD** Colour Hazen 30 **ASTM D1500** Kinematic Viscosity at 100°C cSt 5.2 ISO 3104 Kinematic Viscosity at 40°C cSt 45.2 ISO 3104 Kinematic Viscosity at 0°C cSt 2136 ISO 3104 Specific Gravity at 20°C 1.14 ISO 3675 °C Pour Point -24 ISO 3016 Acid Number mgKOH/g 0.01 ISO 6619 <2 **Chlorine Content** ppm Microcoulometric Water Content 0.03 **ISO ISO 760** %w/w Volume Resistivity at 20°C MOhm.m 500 IEC 60247 Particulate Contamination Passes -/15/12 ISO 4406 10 ISO 6247 Foaming Tendency at 24°C ml Foaming Stability at 24°C 0 ISO 6247 ml Air Release at 50°C min 1.4 ISO 9120 5 ISO 6614 Water Separation (Demulsification) min

#### **Technical data\***

\*The analytical data are guide values.

Page 1 of 6 Edition: 2019-06-04



X

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FIRE RESISTANCE PROPERTY	UNIT	TYPICAL VALUE	TEST METHOD		
Flash Point (open cup)	°C	279	ASTM D92		
Fire Point (open cup)	°C	356	ASTM D92		
Autoignition Temperature (method A)	°C	545	DIN 51794		
Autoignition Temperature (method B)	°C	530	ASTM E659		
Wick Ignition Maximum Persistence	S	0.8	ISO 14935		
Spray Ingnition Maximum Persistence of Burning	s	8	ISO 15029-1		
Spray Ignition Stabilised ignitability grade		E	ISO 15029-2		
Spray Ignition Stabilised flame length grade		D	ISO 15029-2		
Hot Manifold Ignition	°C	No flashing or burning on tube at 741 (pass)	ISO 20823		
*The analytical data are guide values.					
LUBRICATION PERFORMANCE	UNIT	TYPICAL VALUE TEST METHOD			
Vickers Vane Pump Test ring weight loss	ma	6.0 ISO 20763			

Vickers Vane Pump Test ring weight loss	mg	6.0	ISO 20763
Vickers Vane Pump Test ring vane weight loss	mg	2.2	ISO 20763
Vickers Vane Pump Test ring total weight loss	mg	8.2	ISO 20763
Four Ball Wear Test wear scar diameter	mm	0.48	ASTM D4172
FZG Gear Test Failure Load Stage		7	DIN 51354 part 1
FZG Gear Test Specific Weight Loss	mg/kWh	<0.2	DIN 51354 part 1

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Page 2 of 6 Edition: 2019-06-04



X

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STABILITY PROPERTY	UNIT	TYPICAL VALUE	TEST METHOD	
Oxidative Stability Method A acid value change	mgKOH/g	0.14	DIN EN 14832	
Oxidative Stability Method A Metal weight changes iron, copper	mg	0.2, 0.2	DIN EN 14832	
Oxidative Stability Method B viscosity change at 40°C	%	1.3	FTM 791 5308.7	
Oxidative Stability Method B acid value change	mgKOH/g	0.16	FTM 791 5308.7	
Oxidative Stability Method C time to 275 kPa pressure drop	min	321	ASTM D2272	
Hydrolytic Stability Method A acid value change in fluid	mgKOH/g	0.0	DIN EN 14833	
Hydrolytic Stability Method A acid value change in water	mgKOH/g	0.17	DIN EN 14833	
Hydrolytic Stability Method B acid value change in fluid	mgKOH/g	0.00	ASTM D2619	
Hydrolytic Stability Method B acid value change in water	mgKOH/g	0.08	ASTM D2619	
Hydrolytic Stability Method B copper weight change	mg	0.01	ASTM D2619	

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Page 3 of 6 Edition: 2019-06-04



# Reolube<sup>®</sup> Turbofluid 46XC

Fire Resistant Hydraulic Fluid

Page 4 of 6 Edition: 2019-06-04





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Fire Resistant Hydraulic Fluid

MATERIAL APPLICATION	SEALS PACKING HOSES ACCUMULAT- ORS	WIRES AND CABLE INSULATION	PAINTS	FILTERS
Acrylic			U	
Activated Alumina				A
Alkyd Paint			A	
Butyl Rubber	R			
Cellulose				A
Ethylene-Propylene Rubber	R			
Epoxy Paint (cured)			R	
Fuller's Earth			ĺ	A
Ion Exchange Resins				R
Natural Rubber	U		Î	
Neoprene	U			
Nitrocullulose			U	
Nitrile Rubber	U			
Nylon	R	R	Î	
Paper				A
Phenolic Resins			U	
Polyethylene		A		
Polypropylene		А		
Polyurethane Paint			А	
PVC		U	ĺ	
Silicone Rubber	U	A		
Teflon	R	R		
Vinyl Ester Paint			A	
Viton Rubber	R			

Edition: 2019-06-04



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#### Packaging

Reolube<sup>®</sup> Turbofluid 46XC is available in 230kg drums.

#### **Storage conditions**

Store in a cool, dry location

#### Handling

In accordance with safe industrial practice, gloves, safety glasses and an apron should be worn when handling Reolube Turbofluids, and spillages should be dealt with immediately. If allowed to overheat, breathing the fumes should be avoided.

For more extensive information on the safe handling and use of this product, see the Safety Data Sheet.

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Page 6 of 6 Edition: 2019-06-04

