

# FBK TURBINE SH

## Premium Turbine Oil with Additives for hydroelectric power generation facilities

**FBK turbine SH** was developed based on the track record of FBK turbine series, which is the long-life turbine oil with additives produced for the first time in Japan and improved. **FBK turbine SH** is the high-performance turbine oil suited for hydroelectric power facilities. It is formulated with excellent rust inhibitor and detergent to prevent sludge on oil pressure control spool valve. **FBK turbine SH** is the high performance lubricant for the use in hydroelectric power generation unit where unmanned operation or automated system operation is applied.

### ● Special Features

#### 1. Excellent Oxidation Stability

When a lubricant is used continuously for long periods of time, it might gradually degrade and result in sludge formation and machine operation problems.

Turbine oils without additives (JIS K 2213 1 species) have been used for a long time, because the lubrication condition of the hydroelectric power unit is relatively mild.

In recent years, unattended operation and automation control has progressed in the small and medium-sized hydroelectric power plants and pumped-storage power plant of large capacity is increasing. Therefore, oxidation stability improvement and prevention against operational failure of control valve system is required for turbine oils.

**FBK Turbine SH** possesses excellent oxidation stability, which is the same as FBK Turbine for high-temperature and high-pressure thermal power and nuclear power generation, so it can be used for long periods of time even under severe conditions.

#### 2. Outstanding Rust Prevention and Detergency

When the control system oil of hydroelectric power unit is used for a long time, the malfunction of the spool valve of the hydraulic control system due to the sticking will occur.

In particular, the trouble in unmanned power plant is a major problem on the safe operation. From the past of trouble case, the malfunction of the valves has been found to be caused by a) rust, wear particles, foreign matter of the paint or the like is deposited, b) the deterioration of the turbine oil is deposited, on the narrow part of the system.

#### 1) Adoption of high-performance rust-prevention inhibitor

When moisture enters the lubricating oil system, it will threaten the smooth operation by rust and poor lubrication. **FBK Turbine SH** has adopted a high-performance rust-prevention inhibitor which does not generate the deposition of sludge.

#### 2) Adoption of high-performance detergent

Because high-performance detergent is adopted, the organic matter which cannot be removed by filtration equipment is washed out into the oil without adhering to the spool valve.

#### 3. Very Good Emulsion Resistance and Water Separation Properties

If water is present in a lubricating oil or hydraulic fluid, it can emulsify with the oil and cause unstable operation. Oils should be resistant to emulsification and have good water separation properties.

Thanks to the excellent water separation properties of **FBK Turbine SH**, this oil prevents emulsification problems if water becomes mixed with the oil.

#### 4. Good Viscosity/Temperature Properties and Low-Temperature Characteristics

**FBK Turbine SH** undergoes little change in viscosity due to variations in temperature and it has a low pour point, so it performs excellently as a hydraulic fluid.

### ● Applications

Thanks to the outstanding characteristics of **FBK Turbine SH**, this oil can be used for lubrication of a wide range of industrial machinery,

including the following;

- (1) Lubrication system and control system of the hydraulic turbine
- (2) All types of electric generators and motors.

## ● Packaging

200-liter drums and 20-liter cans(except VG68)

## ● Typical Properties of FBK Turbine SH

ISO Viscosity Grade	32	46	56*	68
Color (ASTM)	L0.5	L0.5	L0.5	L0.5
Density (15°C), g/cm <sup>3</sup>	0.842	0.854	0.862	0.867
Kinematic viscosity (40°C), mm <sup>2</sup> /s	31.9	46.4	54.2	67.2
(100°C), mm <sup>2</sup> /s	5.9	7.4	8.1	9.1
Viscosity index	131	123	118	111
Flash point (COC), °C	230	240	244	250
Pour point, °C	-17.5	-15.0	-12.5	-12.5
Acid number, mgKOH/g	0.01	0.01	0.01	0.01
Copper strip corrosion (100°C, 3 h)	1	1	1	1
Rust prevention (artificial sea water, 60°C, 24 h)	No rust	No rust	No rust	No rust

\*Special viscosity grade which is not included in the ISO viscosity grades.

Note: The typical properties may be changed without notice. (Juner 2018)



## Handling Precautions

▼ Follow these precautions when handling this product.

<b>Composition :</b>	Base Oil(s), Additives
<b>Precautionary pictograms:</b>	Not applicable
<b>Signal word:</b>	Not applicable
<b>Hazard Statement:</b>	Harmful to aquatic life Harmful to aquatic life with long lasting effects
<b>Precautionary Statements:</b>	<ul style="list-style-type: none"> <li>• Do not handle until all safety precautions have been read and understood.</li> <li>• Wear protective gloves/protective clothing/eye protection/face protection.</li> <li>• Do not allow the eyes to become exposed to the product. Do not swallow the product.</li> <li>• Avoid release to the environment.</li> <li>• Wash hands thoroughly after handling.</li> <li>• Do not eat, drink or smoke when using this product.</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.</li> <li>• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</li> <li>• If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician.</li> <li>• IF ON SKIN: Wash with plenty of soap and water.</li> <li>• Avoid release to the environment.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight.</li> <li>• Containers that have been opened must be tightly sealed.</li> </ul>
<b>Disposal</b>	<ul style="list-style-type: none"> <li>• Dispose of contents/container in accordance with local/regional/national/international regulations.</li> <li>• If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.</li> </ul>