PRODUCT BULLETIN

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FBK TURBINE

Premium Turbine Oil with Additives

FBK Turbine is the first turbine oil with additives to be produced in Japan. It possesses the outstanding quality and performance required for the lubrication of advanced thermal turbines that operate with high-temperature, high-pressure steam. **FBK Turbine** is ideal for all types of nuclear power, steam, gas and hydropower turbines; this premium quality oil can also be used as a lubricant and hydraulic fluid in a wide range of industrial machinery.

● Special Features

1. Excellent Oxidation Stability

When a lubricating oil is used continuously for long periods of time, it can gradually degrade, resulting in sludge formation and machine operation problems. With advanced thermal power steam turbines operating at high temperatures and pressures, turbine oil problems must be prevented by choosing an oil that has excellent oxidation stability so that it can be used for many years without being replaced. **FBK Turbine** possesses excellent oxidation stability, so it can be used for long periods of time even under severe conditions. Its thermal stability is also very good. Thanks to these superb features, **FBK Turbine** has been adopted by electric power companies for many thermal and hydro power plants, and it has shown top-level performance in every application.

2. Outstanding Rust Prevention

If water enters a lubrication system, it not only can interfere directly with machine operation; it may also cause rust to form inside the system, thus keeping the machinery from operating smoothly. Therefore it is essential that all water be removed from the oil.

The powerful rust preventive agents contained in **FBK Turbine** provide outstanding rust prevention performance. As a result, it keeps rust from forming inside the lubricating system even during long periods of continuous use.

3. Superb Antifoaming Properties

Foaming may occur in lubricating oil or hydraulic fluid for several reasons. Oil and air may be mixed together violently; air may be drawn into the system through poor seals in the pipes; or air and other gases dissolved in the oil may suddenly separate, forming bubbles. Of course, the best solution to foaming problems is to identify the cause and fix it, but it is also desirable that the oil be able to eliminate any foam that does appear.

Special antifoaming agents are added to **FBK Turbine,** thus ensuring excellent defoaming performance during actual use.

4. 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,** this oil prevents emulsification problems if water becomes mixed with the oil.

5. Good Viscosity/Temperature Properties and Low-Temperature Characteristics

FBK Turbine 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**, this oil can be used for the lubrication of a wide range of industrial machinery, including the following;

(1) Nuclear power, steam, gas, and hydro turbines.
(2) All types of electric generators and motors.
(3) Medium and small-sized compressors, blowers, and pumps.
(4) All types of low-load gear transmissions, machine tools, and other industrial machinery.
(5) All types of hydraulic devices.

● Approval・Applicable Standard

Approval
•MHPS MS04-MA-CL001 (32, 46)

Standard
• ISO 8068 L-TSA (32, 46, 68)
• JIS K2213 Turbine oil Type 2 (32, 46, 68)
• ASTM D4304　Type Ⅰ (32, 46, 68, 100)

● Packaging

200-liter drums and 20-liter cans

● Typical Properties of FBK Turbine

ISO Viscosity Grade	32	46	56*	68	100
Color (ASTM)	L0.5	L0.5	L0.5	L0.5	L1.5
Density (15°C), g/cm^3	0.844	0.853	0.861	0.868	0.878
Kinematic viscosity (40°C), mm^2/s	31.9	45.3	54.2	67.2	99.2
(100°C), mm^2/s	5.9	7.3	8.1	9.1	11.5
Viscosity index	131	124	118	111	104
Flash point (COC), °C	240	250	260	270	280
Pour point, °C	-17.5	-15.0	-15.0	-12.5	-10.0
Acid number, mgKOH/g	0.08	0.07	0.08	0.08	0.08
Copper strip corrosion (100°C, 3 h)	1	1	1	1	1
Rust prevention (artificial sea water, 60°C, 24 h)	No rust	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. (December 2008)

Handling Precautions

▼ **Follow these precautions when handling this product.**

Composition：	Base Oil, Additives
Precautionary pictograms:	Not applicable
Signal word:	Not applicable
Hazard Statement:	Not applicable
Precautionary Statements: **Prevention**	・Do not handle until all safety precautions have been read and understood. ・Wear protective gloves/protective clothing/eye protection/face protection. ・Do not allow the eyes to become exposed to the product. Do not swallow the product. ・Wash hands thoroughly after handling. ・Do not eat, drink or smoke when using this product.
Response	・IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. ・IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. ・If the eyes are exposed to the product: Rinse the eyes with plenty of running water and immediately contact a physician. ・IF ON SKIN: Wash with plenty of soap and water.
Storage	・The product must be stored in a cool, well-ventilated location where it will not be exposed to direct sunlight. ・Containers that have been opened must be tightly sealed.
Disposal	・Dispose of contents/container in accordance with local/regional/national/international regulations. ・If there are any doubts about proper methods of handling the product, contact the point of purchase before proceeding with usage.