

Shell VALVATA® Oils J

Compounded steam cylinder oil

Shell VALVATA® Oils J are quality refined, high viscosity mineral oils compounded with a small percentage of fatty oils. They are used, primarily, for the lubrication of steam cylinders working under high temperature, high pressure conditions, where low carbon formation and 'steam washing' are important considerations. They atomize more easily and with steam of moderate superheat and produce more tenacious lubricating films than 'straight' grades of the same viscosity.

Performance Features and Benefits

- **Good thermal resistance and oxidation stability**
Possess low volatility and a natural resistance to the formation of gummy or carbonaceous deposits in high temperature conditions.
- **Tenacious lubricating oil film**
Provides effective lubrication and corrosion protection even when subjected to heavy steam-washing conditions

Main Applications

- Seam cylinder lubrication
- Low speed enclosed gears
- Certain worm gears

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

Steam Engine Lubrication

In steam engines, the lubrication requirement of the cylinders and other parts exposed to steam differ from those of bearings and other external parts working under far less arduous conditions. The lubrication requirements of cylinders and bearings must be considered separately.

Steam Cylinder Lubrication

The function of a steam-cylinder lubricant is to form an oil film that will adequately lubricate the rubbing surfaces at high operating temperatures and also prevent leakage past valves, pistons and glands. Efficient atomization, easy spreading over the working surfaces and the ability to resist scouring action of the steam (the washing effect of water) are other important properties.

Steam-cylinder oils are classified according to

steam temperature and engine power. The higher the steam temperature the more powerful the engine, the greater will be the required heat stability which is generally related to viscosity. Compounded oils, such as Shell VALVATA® Oils J, have an advantage over 'straight' grades under environments of moderate superheat. However, fatty oils volatilize under high superheat conditions and show little advantage over 'straight' grades under these conditions. Because of their emulsification properties, compounded oils may be difficult to separate from water. Where water separation is important, a 'non fatty' lubricant, such as Shell VITREA® Oils, should be used.

Bearing Lubrication of Steam Engines

There are two types of crankcase engine, the open and the enclosed type:

For open crankcase bearing lubrication ordinary machine oils, such as Shell VITREA® Oil, are suitable.

Enclosed crankcase engines have force-feed circulating systems where the oil is liable to be contaminated with water through steam leakage. The oil must, therefore, separate readily from the water so that it can drain off from time to time. SHELL TURBO® Oils T are recommended for this purpose.

Low Speed Enclosed Gears

Shell VALVATA® Oils J may be used to advantage in worm gears prone to suffer extensive wear and to reduce the bulk oil temperature. Typical examples are gears running at low speed under stop-start conditions.

Handling and Safety Information

For information on the safe handling, storage, or use of this product, refer to its Material Safety Data Sheet at <http://www.epc.shell.com/>. If you are a Shell Distributor, please call 1+800-332-6457 for all of your service needs. All other customers please call 1+800-237-8645 for all of your service needs.

Protect the Environment

Do not discharge into drains, soil, or water.

Typical Physical Characteristics

Shell VALVATA® Oils J		J 460	J 680	J 1000
ISO Viscosity Grade		460	680	1000
Kinematic Viscosity	ASTM D 445			
		@ 40°C cSt	460	680
@ 100°C cSt		31.5	37.0	40.6
Viscosity Index	ASTM D 2270	99	80	70
Specific Gravity @ 15°C	ASTM D 4052	0.903	0.910	0.925
Flash Point COC °C	ASTM D 92	270	275	305
Pour Point °C	ASTM D 5949	-6	-6	-6

These characteristics are typical of current production. While future production will conform to Shell specifications, variation in these characteristics may occur.

Grade Selection

Lubricant Application		Shell Grade	Remarks
Cylinders			
Steam Temperature Up to 315°C Up to 300°C Saturated or wet steam up to 220°C	Horsepower Up to 500 Up to 1500 Over 500	Shell VITREA® Oils Shell VITREA® Oils Shell VALVATA® Oils J*	*Compounded oil should not be used where separation from the condensate is important
Bearings Open crankcase engines Enclosed crankcase engines		Shell VITREA® Oils SHELL TURBO® Oils T#	# More viscous grades with more Powerful engines