

# Shell Lubricants Products

## Turbine Oils

### Your turbine systems



- The turbine is used as the prime mover for driving equipment such as blowers, pumps and compressors, but its predominant use is to drive alternators and generators for the production of electricity.
- The size of turbines for power generation has increased tremendously in the last three decades, resulting in higher bearing loads and journal peripheral speeds.

### Shell recognizes the importance of protecting your turbines

- Turbines convert the energy of a stream of fluid into mechanical energy in the form of rotation.
- A jet of high pressure fluid is forced onto a series of blades mounted around a central shaft, causing the shaft to rotate.
- Turbines may be driven by water, steam or high pressure/high temperature gas.

### Shell understands the role that turbine oils play in your business

- Turbine oils have to perform satisfactorily under arduous conditions and must withstand continuous thermal cycling and contamination by solid particles, sludge, water, air, hydrogen and process materials.
- Turbine oils provide bearing lubrication, but many turbines have gears or are directly coupled to gearing to take the power output, and so some gear lubrication is needed. Valves in the hydraulic or governor circuits also need to be lubricated. In hydro/water turbines, the guide vane sliding surfaces need to be lubricated along with the bearings.
- In steam turbines the turbine oil functions predominantly as a coolant.

### Shell portfolio of products to help you compete in your market

| PRODUCT BRAND     | DESCRIPTION  |
|-------------------|--|
| Shell Turbo       | General application hydroelectric and steam turbine oil for less severe applications                               |
| Shell Turbo T     | Industry standard turbine oil for hydroelectric and steam turbines   |
| Shell Turbo CC    | Industrial gas, steam and combined-cycle turbine oil suitable for both general and highly loaded gear applications |
| Shell Turbo J 32  | Developed for Mitsubishi Heavy Industries steam and gas turbines   |
| Shell Turbo DR    | Fire-resistant hydraulic fluid based on tri-aryl phosphates  |
| Shell Turbo GT    | High performance industrial gas turbine lubricant  |
| Shell Turbo GT-EP | High performance anti-wear steam and gas turbine oil for use with highly loaded gears                              |



## Performance Specifications

- Performance specifications are set in relation to the requirements of industry standards and major turbine manufacturers. Industry standards include ASTM, BS, DIN, ISO, JIS.
- Consult individual product data sheets for details.

## OEMs

- Products in the Shell Turbo range of turbine oils are formulated in accordance with the requirements of the main turbine OEMs such as ABB, GEC-Alstom, General Electric, Mitsubishi Heavy Industries, Siemens-Westinghouse.

## Availability

- Shell Turbo products are available in all the markets where Shell Lubricants are present.
- The various Shell Turbo products are offered in ISO 32 and 46 viscosity grades. Selected products are available in 68 and 100 grades.
- All Shell turbine oils are available in 209 litre or 55 gallon drums. However, depending on the geography and country, it is also possible to purchase products in 20 litre or 5 gallon pails, bulk and intermediate bulk containers. Availability is subject to local Shell commercial and supply chain conditions.

## Key customer needs and Shell product benefits

| WHAT CUSTOMERS TYPICALLY NEED FROM A HYDRAULIC OIL  | VALUE BENEFITS AVAILABLE FROM THE SHELL PRODUCT RANGE                                      | APPLICATION ADVANTAGE FROM WHICH THE BENEFITS ARE DERIVED                              | PRODUCT FEATURES WHICH DELIVER THE APPLICATION ADVANTAGES   |
|---|--|--|---|
| Longer equipment component life                     | Lower operating costs  | Longer component life  | Excellent thermal stability                                 |
| Robust equipment protection = Longer equipment life | Lower equipment costs, lower replacement costs, lower maintenance costs, reduced down time | Turbine system protection  | Outstanding anti-wear performance                           |
| Extended oil life                                   | Reduced risk of unplanned downtime   | Appropriate protection, maximising available oil life                                  | Excellent oxidation resistance                              |
| Improved start-up efficiency                        | Lower operating costs, improved productivity   | Reduced need for start-up preheating, improving the efficiency of stop-start operation | Excellent pumping characteristics (Shell Turbo GT)          |
| System compatibility                                | Reduced risk of unplanned downtime   | Allows consolidation of stock  | Single oil for both steam and gas turbines (Shell Turbo CC) |