



FROM PROTECTING TURBINE SYSTEMS TO POWERING PROGRESS

Shell Turbo makes it possible

The Shell Turbo range of oils helps to protect your equipment
and to ensure efficient operation throughout its lifetime.

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**SHELL
LUBRICANT
SOLUTIONS**

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SHELL LUBEANALYST

Monitor, benchmark, improve and save

Shell LubeAnalyst is a health check for your lubricants and machinery. It is an oil condition monitoring service that helps you to keep your business running smoothly by identifying potential oil or equipment failures before they become critical. Shell LubeAnalyst will help your business to save money and time on maintenance and potential lost production caused by equipment failures.

It is an early-warning system that aims to give you peace of mind knowing that both your equipment and your lubricants are in optimum working order. A global platform, Shell LubeAnalyst is available in 95 countries and 27 languages, and has more than 75 million data points.

Shell provides four individual test suites (see Table 1) designed for your specific turbine application.

A comprehensive range of additional tests is available. Please consult your local Shell technical representative for further details.

ON-SITE SERVICE PACKAGE

The Shell offer extends beyond oil products and oil analysis. It also includes services such as contamination control and support with commissioning, flushing, filling and filtration.

SHELL LUBEANALYST TURBINE OIL CONDITIONING MONITORING PACKAGES

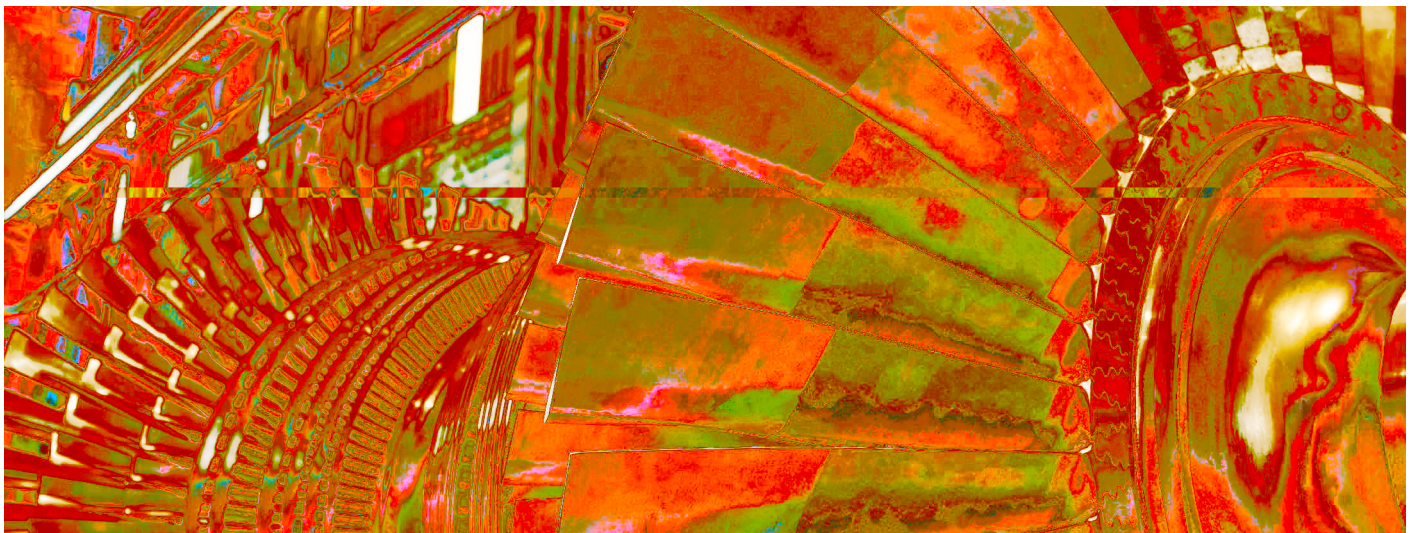
TEST	INDUSTRIAL STEAM, LIGHT- AND HEAVY-DUTY GAS, COMBINED-CYCLE TURBINE SYSTEMS AND TURBOCOMPRESSORS			INDUSTRIAL STEAM TURBINES WITH ELECTROHYDRAULIC CONTROL SYSTEMS
	OCM Turbine Suite – Advanced Quarterly ²	OCM Turbine Suite – Advanced Semi-annual ³	OCM Turbine Suite – Advanced Annual ⁴	OCM Turbine Suite – Advanced Control Fluids Three-monthly ⁵
Appearance (visual)	■	■	■	■
Colour (ASTM D1500)	■	■	■	■
Kinematic viscosity at 40 °C (ASTM D445)	■	■	■	■
Density at 15 °C (ASTM D4052)				■
Total acid number (ASTM D664)	■	■	■	■
Water (Karl Fischer) (ASTM D6304)	■	■	■	■
Wear metals/additive elements by ICP (ASTM D5185)	■	■	■	■
Particle count – cleanliness (ISO 4406-99)	■	■	■	■
Millipore sludge (0.8µ ISO 4405)	■	■	■	
Water separability at 54 °C (ASTM D1401)			■	
Rust test (ASTM D665-A)			■	
Foaming (Sequence I, II, III) (ASTM D892)		■	■	
Air release (ASTM D3427)		■	■	■
RPVOT (ASTM D2272)			■	
Varnish potential MPC (ASTM D7843)	■	■	■	
Oxidation by FTIR (ASTM E2412)	■	■	■	
Anti-oxidant trending RULER™ (ASTM D6810, D6971)	■	■	■	
Chlorine content (ISO 15597)				■
Volume resistivity (IEC 60247/ASTM D1169)				■
Voltammetry antioxidant trending RULER (ASTM D6810, D6971)	■	■	■	
Demulsibility (ASTM D1401, ml-ml-ml (min)			■	

Table 1: Test kits and test methodologies (tests may vary by region).

²Shell recommends OCM Turbine Suite – Advanced Quarterly turbine oil test suite for all turbines
³Shell recommends OCM Turbine Suite – Advanced Semi-Annual turbine oil test suite for steam turbines and combined cycle systems every six months
⁴Shell recommends OCM Turbine Suite – Advanced Annual turbine oil test suite for all turbines at first fill, for three-yearly major overhaul activities and for steam and gas turbine systems on an annual basis
⁵Shell recommends OCM Turbine Suite – Advanced Control Fluids Three-monthly or maximum on an annual basis

PRODUCT	CATEGORY DESCRIPTOR	BENEFITS	TECHNOLOGY	ISO VISCOSITY GRADES	SPECIFICATIONS AND APPROVALS (Full details of approvals for all products can be obtained from your Shell representative; approvals and claims will vary by viscosity grade.)
Shell Turbo S4 GX	Industrial steam, light- and heavy-duty gas and combined-cycle turbine systems, including geared turbines with load requirements	- Extended oil life⁶ - Enhanced wear protection⁶	Shell GTL (gas-to-liquids) technology	32, 46	Approved by or meets Alstom HTGD 90 117 V0001 Y; ASTM 4304-13 Type I, II and III; Dresser Rand 003-406-001 Type I and III; GB 11120-2011, LTSE, LTGE and L-TGSE; General Electric GEK 32568j, GEK 46506e, GEK 28143b, GEK 101941a, GEK 107395a and GEK 120498; Siemens Power Generation TLV 9013 04 and 05, Ruston report 65/0027 and Turbo-machinery ICW0047915; Solar ES 9-224W Class II; MAN D&T SE TED 10000494596; ISO 8068 LTSE, LTGE and L-TGSE; JIS K-2213 Type 2; DIN 51515 Part 1 L-TD and Part 2 L-TG
Shell Turbo S4 X	Industrial steam, light- and heavy-duty gas and combined-cycle turbine systems	- Extended oil life⁶ - Enhanced efficiency⁶	Shell GTL technology	32	Approved by or meets Alstom HTGD 90 117 V0001 Y; Dresser Rand 003-406-001 Type I and III; General Electric GEK 32568j, GEK 46506e, GEK 28143b Type I and VII, GEK 107395a and GEK 120498; Siemens Power Generation TLV 9013 04 and 05, Ruston report 65/0027 and Turbo-machinery ICW0047915 (non-EP); Westinghouse 21 TO591 and 55125Z3 and Eng Spec_ DP21T-00000443; Solar ES 9-224W Class II; MAN D&T SE TED 10000494596; ASTM 4304-13 Type I and III; GB (China) 11120-2011, L-TGA, L-TSA and L-TGSB; DIN 51515 Part 1 L-TD and Part 2 L-TG
Shell Turbo T	Industrial steam, light- and heavy-duty gas and combined-cycle turbine systems and turbocompressors	- Reliable performance - Reliable protection	Mineral oil	32, 46, 68, 100	Approved by or meets Siemens TLV 9013 04; Alstom HTGD 90-117 V; MAN Turbo SPD 10000494596; MAG Cincinnati P-38, P-55 and P-54 (appropriate viscosity grade); GEK 27070, 28143A, 46506E, 32568f and 107395a; Siemens Westinghouse 55125Z3; GEC Alstom NBA 50001A; Solar ES 9-224W Class II; DIN 51515 Parts 1 (L-TD) and 2 (L-TG); ISO 8068; JIS K-2213 Type 2; ASTM D4304-06a Type I and III; and BS 489:1999
Shell Turbo J	Industrial steam, light- and heavy-duty gas and combined-cycle turbine systems and turbocompressors	- Reliable performance - Reliable protection	Mineral oil	32	Meets the following MHI specifications: Turbine Oil Type 2 (additive); MS04-MACLO01 (R-1); MS04-MA-CL002 (R-1)
Shell Turbo S5 DR	Industrial steam turbines with electrohydraulic control systems	Excellent fire resistance	Phosphate ester	46	Meets and exceeds the requirements of major original equipment manufacturers such as General Electric, Mitsubishi Hitachi Power Systems and Siemens. Approved by Factory Mutual Global against Standard 6930 for "Less flammable hydraulic fluids". Meets the requirements of ISO Standard 12922 and ASTM 4293 for HFDR-type fire-resistant hydraulic fluids.

⁶Compared with market representative products



REAL-WORLD VALUE DELIVERING EXTENDED OIL AND EQUIPMENT LIFE



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