

Lubricant Technology

The corporate philosophy of fostering an employee-centric culture prevails at the R&D Centre too. With a view to address the diverse needs of IndianOil, prime focus is accorded to develop and nurture the highly qualified and skilled human capital at the Centre. Utmost importance is given to the functional and developmental training needs of the over 400 strong team at the Centre.

Top-of-the-Shelf Products developed at R&D Centre

- New generation, high performance passenger car, heavy duty diesel engine and driveline lubricants for automotive sector.
- First ever multi-grade railroad lubricant for Indian Railways with proven credentials of fuel and oil savings.
- Flagship patented marine lubricant technology duly approved by OEMs after successful field trials in ships and DG sets.
- Industry benchmark turbine, hydraulic and system oils with field proven credentials and OEM accreditations.
- Transformer oils for power generation industry.
- Synthetic lubricants for applications such as anti-micro pitting, turbo generator and fire resistant hydraulic fluid.
- Low PAH rubber process oils for tyre industry.
- Non toxic, biodegradable, farmer friendly agricultural spray oil for protection of crops from pests and diseases.
- Wide range of food grade lubricants and greases duly approved by NSF, USA.
- High performance greases based on titanium, sulfonate complex and poly urea for critical high temperature and high load applications.
- An extensive range of bio-stable water soluble and semi-synthetic cutting oils, with longer sump life and excellent lubricity for heavy duty cutting application.

MAJOR TEST FACILITIES FOR LUBRICANT DEVELOPMENT

The product development laboratories are equipped with state-of-the-art facilities for the evaluation and testing of base fluids, additives and finished products as per Indian and international standards like BIS, ASTM, IP, DIN, JIS, DEF STAN, FTMS, ISO, etc.

- Cold Cranking Simulator
- Mini-Rotary Viscometer
- High Temp High Shear Viscometer
- Scanning Brookfield Viscometer
- Sonic Shear Stability
- Particle Counter
- Dispersancy Test
- Panel Coker Test
- TEOST Chrysler Test
- Caterpillar Micro Oxidation test [CMOT]
- PDSC, DSC / TGA
- RPVOT / TFOUT
- Komatsu Hot Tube Tester
- ISOT JIS K 2514

- Tan Delta & Specific Resistivity
- RULER
- Automated ASTM D-943
- Corrosion Tests as per ASTM / IP / JIS / OEMs procedures
- SKF Noise Tester
- Flow Pressure Equipment for greases
- Rheometer for greases

Tribology Research:

Tribology plays an important role in undertaking the lubricant performance under two rubbing surfaces in the field. Friction and wear characteristics of newly developed lubricants and greases are determined under simulated contact geometries with varying pressure, temperature and speed. Latest ASTM, IP, DIN test compliant equipment and specially designed research test rigs are used for developing lubricants meeting customers' aspirations.

MAJOR TEST BENCHES / FACILITIES:

- ASTM Auto Gear Oil Test Facilities (L-33, L-60-1, L-37 & L-42)
- Atomic Force Microscope
- Bearing Vibration
- EHD Film Thickness
- EMCOR
- Experimental Rolling Mill
- FAG FE8 and FE9
- Ferrography
- FZG
- HFRR / BOCLE
- High Frequency Friction
- High Temperature & Gas Tribometer
- Hydraulic Pump
- IVF Quenchometer
- Journal Bearing Test Rig
- KRL Shear Stability
- Nano-indenter
- SKF ROF
- SKF V2F
- SRV
- Tapping Torque

Engine & Vehicle Testing:

Performance evaluation of newly developed automotive lubricants for gasoline, diesel, CNG / HCNG fuels in prescribed standard forms a vital step in the development cycle. These engine tests determine the efficiency of the new products in end use applications. The engine test laboratory has 19 test benches including standard and modified indigenous engines for endurance tests. Rigorous testing of newly developed automotive lubricants and fuels is

performed on specially designed chassis dynamometer benches. Mileage accumulation chassis dynamometers vary road-load conditions and also assess its impact on the durability aspects.

MAJOR ENGINE TEST BENCHES:

- Leyland-370 - Soot Related Oil Thickening
- Petter AV1 - Fuel Economy / Oil Consumption
- Caterpillar 1M-PC & Cat IN - Piston Deposits
- Maruti IID/IIIE - Oxidation Stability
- Hero Honda - Endurance, Deposits
- ASTM Sequence VIII - Bearing Corrosion
- ASTM Sequence VIB - Fuel Economy
- ASTM Sequence V G - Low Temperature Sludge & Varnish
- ASTM Sequence IVA - Cam Lobe Wear Test
- Metrology - Engine Parts Rating & Measurement
- Chassis Dynamometers For Mileage Accumulation