Innovation Hub

FUEL AND LUBRICANTS LAB

The lab is responsible for checking the physico-chemical characteristics of:

- Liquid fuels (crude oil, diesel, fuel residues).
- Lubricants (turbine oils, engine oils, hydraulic oils, valvolines, transformer oils, used lubricants).
- Greases (penetration tests, oxidation, water leaching, etc.).

Key equipment

- Key physico-chemical measuring instrumentation: for density, viscosity, ignition point, distillation, calorific value, Karl-Fischer humidity test, and particulates.
- Energy Dispersive X-ray Fluorescence (ED-XRF).
- Infrared spectrometer (FT-IR).
- Elemental analysis (C-H-N-S).
- Automatic titration (TAN, TBN).
- Rotating Pressure Vessel Oxidation Test (RPVOT).

ANALYTICAL CHEMISTRY LAB

- Trace element and heavy metal analyses in industrial water, liquid waste and sea water.
- Solid sample analyses (fly and wet ash, lignite, sediment, soils, refractory materials, particle retention filters, etc.).
- Elution tests on solid waste and sludge.
- Metal and alloy analyses and identification.
- Fuel and lubricant analyses (wear metals, additives).

Key equipment

- Atomic emission spectrometers (ICP-OES and ICP-MS).
- Arc spark spectrometer.
- Atomic absorption spectrometers: with a Zeeman Graphite Furnace and Hydride generator system.
- Ultraviolet–visible spectrometer (UV-VIS).
- Inorganic materials Carbon (C) and Sulphur (S) detector.
- Mercury (Hg) analysers featuring thermal decomposition and amalgamation.

ENVIRONMENTAL CHEMISTRY AND SPECIAL MATERIALS LAB

- Physico-chemical analyses on liquid waste and industrial water and on ash, sludge and soil eluates: pH, conductivity, colour, total dissolved solids (TDS), suspended solids (SS), alkalinity, anions, chemical oxygen demand (COD), total carbon (TOC) and total nitrogen (TN), ammonias (NH_4^+), cyanides (CN), phenols, etc.
- Fat and oil identification in liquid samples.
- Accelerated Weathering Testing for plastics and composite materials.
- Corrosion tests (salt spray test, SO_2 exposure) on metallic materials.
- Plastics testing (identification, flammability, Vicat point).
- Plating tests (thickness, uniformity).
- Tests on other industrial materials: Wiping rags, tows, gloves, paper, detergents, etc.

Key equipment

- Liquid chromatography systems HPLC with a UV-VIS detector, capillary ion chromatograph.
- TOC, TC and TN analysers for liquid and solid samples.
- Accelerated Weather Testing chamber (with Xenon lights) and corrosion chamber.

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