ENVIRONMENT DIVISION

Edward Food Research & Analysis Centre Limited

The five spheres of the Earth System include the atmosphere, hydrosphere, biosphere, lithosphere, and cryosphere (De Blij et al., 2005). Environmental monitoring can be helpful in detecting baseline patterns and patterns of change in the inter and intra process relationships between and within these spheres. The sampling of air, water, and soil through environmental monitoring can produce data that can be used to understand the state and composition of the environment and its processes (Artiola et al., 2004; Wiersma, 2004).

Evaluating the quality of Raw materials & final products is not limited to evaluating their function and performance. The quality must be confirmed before the intended use of raw material & product. Environmental testing not only confirms quality through tests such as simulation testing and product life testing, it also can truly be called the indispensable prerequisite to quality assurance.

EFRAC undertakes all Environmental Monitoring & Analysis & has most sophisticated instruments, which are equipped with automated robotics functions, Data loggers & qualifies IQ, OQ, PQ requirements. The test methods are validated in accordance to the requirements of ISO 17025:2005. Team of qualified samplers draws samples for site in accordance to scientific requirements. EFRAC has a dedicated team of Qualified & skilled scientists to undertake Environment Impact Assessment studies.

- Environment
- Food & Agri
- GMO

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- Drugs & Pharma
- R & D
- Trainings

At EFRAC, we offer a comprehensive range of analytical services for our clients like: Ambient Air Quality Monitoring, Stack Emission Monitoring, Indoor Air Quality Monitoring, Work Zone Air Monitoring, Surface Water/Ground Water/Effluent Water Analysis, Soil/Sludge/Municipal Waste/Hazardous Waste (TCLP) Analysis, Weather Monitoring, Noise Level Monitoring, Illumination Testing, Ventilation Testing, Coal and Coke/Petroleum and its product/Cement/Fly Ash Analysis, under its Environment Division.


Ambient Air Monitoring
Stack Emission Monitoring
Indoor Air Quality Monitoring
Work Zone Air Monitoring
Noise/Illumination Monitoring
Meteorological Monitoring
Water/Ground Water Analysis
Process Water Analysis
Waste/Effluent Water Analysis
Soil Analysis
Municipal Solid Waste/Hazardous Waste Analysis
Coal & Coke Analysis
Petroleum & its product Analysis
Cement & Fly Ash Analysis
EIA/EMP/Environmental audit/Risk Assessments
Regulatory Documentation
ENVIRONMENT DIVISION

APPROVALS & ACCREDITATIONS

T-2439
T-2440

Ministry of Environment
and Forests,
Government of India

WEST BENGAL

मानकः पथप्रदर्शकः
Bureau of Indian Standards

GLP
Good Laboratory Practice

OHSAS 18001
DNV

INDUSTRIES WE CATER

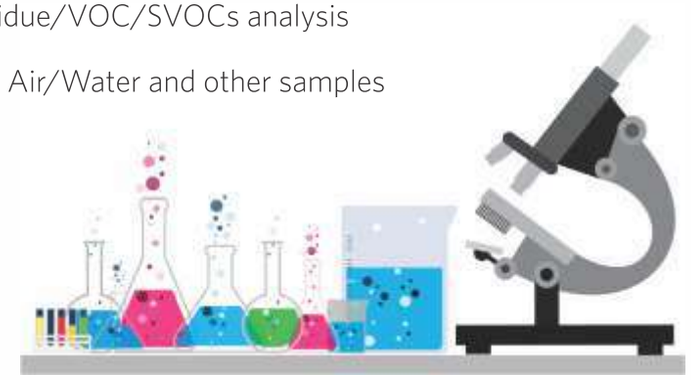
To cater the growing needs of the Manufacturing Industries, Regulatory Bodies, Govt. Authorities, EFRAC offers a broad spectrum of Environmental Monitoring, Analytical Services & Complete Solutions to meet the requirements of the industries with respect to Environmental Legislation and Compliances.

Major industries we cater:

01. Petroleum Oil Refineries
02. Sugar Industries
03. Thermal Power Plants
04. Textile Industries
05. Dye and Dye-Intermediate Industries
06. Electroplating Industries
07. Cement Plants
08. Coke Ovens
09. Pulp and Paper Industries
10. Leather Tanneries
11. Fertilizer Industries
12. Mining Industries
13. Chemical Industries
14. Pharmaceutical Industries
15. Iron & Steel Industries
16. Aluminium Plants
17. Hotel/BPO/Shopping Malls
18. Glass Industries
19. Food & Beverage Industries
20. Sponge Iron Plants
21. Incinerators, etc.

The salient features of our laboratory are:

- State-of-the-art instrumentation
- 'HR-GC HR-MS' dedicated for **Dioxins & Furans** analysis
- Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS), Atomic Absorption Spectroscopy (AAS) dedicated for Trace Metal analysis
- Ion Chromatography (IC) for Anion analysis in Storm Water/Rain Water/DM Water/Steam
- GC-MS MS/LC-MS MS dedicated for Pesticide Residue/VOC/SVOCs analysis
- 'Real Time-PCR' based Rapid Pathogen Detection in Air/Water and other samples
- Highly trained & skilled manpower
- Specialist sample collection squad
- Online customer support & report portal



AMBIENT AIR MONITORING

Open air, in which humans and other organisms live and breathe, is defined as 'Ambient Air'. Its content and quality are directly affected by the day-to-day activities of humans, industry and so on. In turn, ambient air quality has a direct effect on both public health and the welfare of the ecosystems. Ambient Air Monitoring is the systematic, long-term assessment of pollutant levels by measuring the quantity and types of certain pollutants in the surrounding, outdoor air.

Air quality monitoring is carried out to assess the extent of pollution, ensure compliance with national legislation, evaluate control options, and provide data for air quality modeling. The locations for monitoring stations depend on the purpose of the monitoring.

Most monitoring networks are designed with human health objectives in mind, therefore monitoring stations are established in population centres. The measurement of both type and quantity of these contaminants is an important part of obtaining the data needed to implement a meaningful control program. Therefore the quality of the Ambient Air needs to be monitored on regular basis. As per the new regulation, proposed by CPCB, all the 12 mandatory parameters are analyzed by the Environment Division of EFRAC.

PARAMETERS COVERED

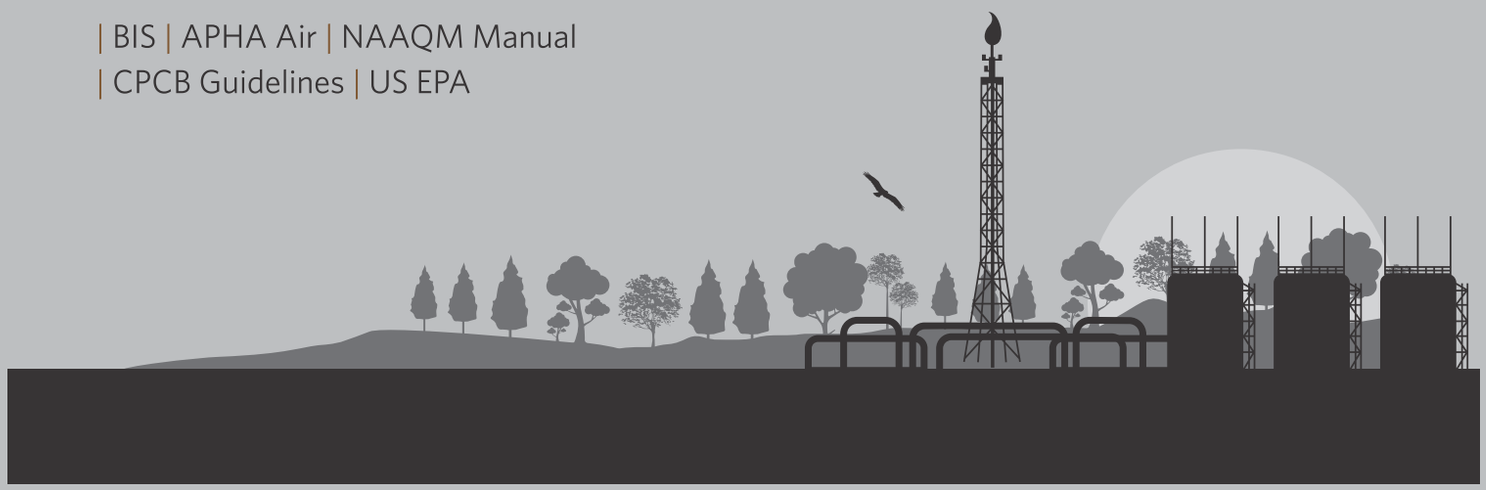
| PM_{10} | $PM_{2.5}$ | Oxides of Sulphur | Oxides of Nitrogen
| Ozone | Ammonia | Volatile Organic Compounds
| Poly Aromatic Hydro Carbons | Heavy Metals (Ni, As, Pb, etc.)
| Carbon Monoxide | Fluoride | Hydrogen Sulfide | Formaldehyde
| Carbon Dioxide | Oxygen | Hydrocarbon

INSTRUMENTS AVAILABLE

| PM 2.5 Sampler | Respirable Dust Sampler | Gaseous Sampler
| Benzene Sampler | CO Analyser (Horiba) | SKC Pump
| Portable Multi-Gas Analyser | ICP-MS | AAS-GTA/VGA
| HPLC | HS-GC-FID | GC-MS MS (QQQ)
| UV Visible Spectrophotometer | Semi Micro Balance

REFERENCE METHODS/STANDARDS

| BIS | APHA Air | NAAQM Manual
| CPCB Guidelines | US EPA



STACK EMISSION MONITORING

Emission analysis from 'STACK or SOURCE' is a challenging issue in Indian Industry. We at EFRAC are offering accurate analysis of stack & source emission for 'Regulatory Bodies', different kind of 'Industries' and for 'Pollution Control Equipment manufacturers'. Emission measurement is the technique of characterising and measuring Air Pollutants emitted from the stacks.

Our stack monitoring team routinely collect samples from Stacks for all regulated pollutants, including Criteria Pollutants, 'Hazardous Air Pollutants', 'Volatile Organic Compounds' and 'Heavy Metals'. We have special facility to collect samples from stacks for Dioxins & Furans and the collected samples are analyzed by HR-GC HR-MS.

As per The Air (Prevention and Control of Pollution) Act 1981, it is mandatory for all the industries to check the emission levels from the stacks within a regular interval. Besides the regular monitoring we are expertise to check the performance and efficiency of the pollution control devices.

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PARAMETERS COVERED

| Temperature | Moisture | Barometric Pressure
| Oxygen | Carbon Monoxide | Carbon Dioxide
| Velocity | Flowrate | Particulate Matter | Sulphur Dioxide
| Nitrogen Oxides | Acid Mist | Total Hydrocarbons
| PCB and PAH | VOC & Semi-VOC
| Dioxins and Furans | Metals

INSTRUMENTS AVAILABLE

| Stack Sampling Kit | Dioxin-Furan Sampling Kit | Orsat Apparatus
| Flue Gas Analyser | EPA NO_x Apparatus | VOC Sampling Kit
| Barometer | AAS-VGA/GTA | ICP-MS | HPLC | HS-GC-FID
| GC-MS MS (QQQ) | HR-GC HR-MS | Ion Chromatography
| Automatic Rotavapour | Auto Soxhlet Extractor
| UV Visible Spectrophotometer | Analytical Balance

REFERENCE METHODS/STANDARDS

| BIS | APHA Air | CPCB Guidelines
| ASTM | USEPA

INDOOR AIR QUALITY MONITORING

Nowadays, indoor air quality has become an important health and safety concern. The indoor air pollution is increasing rapidly all over the world due to:

- Improper or inadequately maintained heating and ventilation system.
- Contamination by construction materials, fibreglass, particle boards, paints, etc.
- Increase in number of building occupants and time spent indoors, inadequate temperature, humidity, lighting and excessive noise.

The threats are not only limited to the Toxic Chemicals (VOC, Semi-VOC, Toxic Gases, Toxic Metals) but the Biological Pathogens also cause serious harmful effects on human health.

It is important to monitor the indoor air quality very precisely at periodical intervals for the safety of human health. EFRAC has adequate ultramodern instruments and professional scientists to quantify the criteria pollutants in the Indoor Air which is beneficial for better Indoor Air Quality Management.

PARAMETERS COVERED

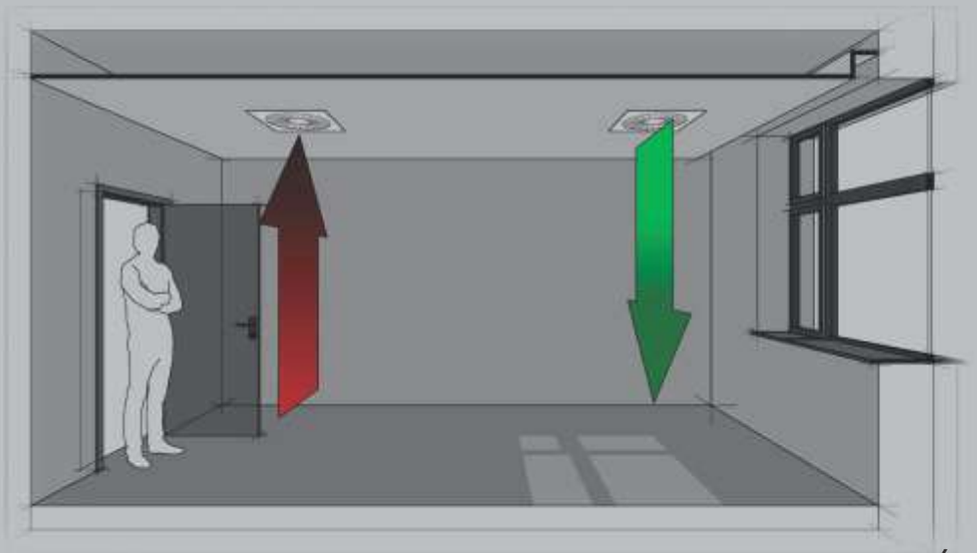
| Temperature | Humidity | PM_{10} | $PM_{2.5}$ | Sulphur Dioxide
| Oxide of Nitrogen | Carbon Dioxide | Silica | Ozone
| Formaldehyde | VOC & Semi-VOC | Total Dust Concentration
| Carbon Monoxide | Metals | PAH and PCB
| Noise | Illumination | Ventilation
| Airborne Mold & Bacteria | Spore Count | Swab | Settle Plate Assay

INSTRUMENTS AVAILABLE

| Hygrothermometer | Barometer | Multi Gas Analyser
| Gaseous Sampler | $PM_{2.5}$ Sampler | RDS | CO Analyser
| Handy Sampler | VOC Sampler | Air Sampler (Micro)
| AAS-GTA/VGA | ICP-MS | HPLC | GC-MS MS (QQQ)
| LC-MS MS (QQQ) | HS-GC-FID | CO Analyzer
| UV Visible Spectrophotometer | Real Time-PCR

REFERENCE METHODS/STANDARDS

| BIS | APHA Air | ASTM | NIOSH
| OSHA | USEPA | WHO
| ACGIH | ASHRAE



WORK ZONE QUALITY MONITORING

Work Zone is an area of the activity of production that includes construction, maintenance or any other utility-work activities. A work zone is typically marked by signs, channeling devices, barriers, pavement markings.

It is essential to monitor the work environment from time to time, to ensure the quality of the Work Zone Air. The health of the workers is directly affected by the toxic dust/fumes in the polluted work environment. As per the Factories Act 1948, it is mandatory for each and every industry to monitor the Work Zone Environment or Fugitive Emission frequently, for the workmen's safety.

EFRAC is one of the finest laboratory with state-of-the-art instrumentation and highly skilled team of engineers for sampling and quantifying the Toxicity Level in the Work Area.

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PARAMETERS COVERED

| Temperature | Humidity | Carbon Monoxide | Carbon Dioxide
| Sulphur Dioxide | Oxides of Nitrogen | Ozone | Formaldehyde
| VOC & Semi-VOC | Total Dust | Metals | PCB and PAH
| PM_{10} | $PM_{2.5}$ | Asbestos Fibre | Lower Explosive Limits
| Other Pollutants as per schedule-II (Factory Acts 1948)
| Airborne Mold & Bacteria | Pathogens | Spore Counts | Swab

INSTRUMENTS AVAILABLE

| Hygrothermometer | Barometer | Multi Gas Analyzer
| Handy Sampler | VOC sampler | Air Sampler (Micro)
| AAS-GTA/VGA | ICP-MS | HPLC-FLD | HS-GC-FID | LEL Meter
| CO Analyser | UV Visible Spectrophotometer | Real Time-PCR

REFERENCE METHODS/STANDARDS

| BIS | APHA Air | ASTM | NIOSH | OSHA | USEPA
| WHO | ACGIH | ASHRAE | Factory Rules

NOISE MONITORING

Noise is a sound, especially the one that is loud or unpleasant or that causes disturbances. There are many causes for generating loud and unpleasant sound viz, Industrialization, Poor Urban Planning, Social Events, Transportation, Construction Activities and Household Chores. Excessive noise in working areas can influence psychological health. Sometimes it causes hearing loss, occurrence of aggressive behavior, hypertension, sleeping disorders, cardio-vascular disease, etc.

Accident may happen in the industry due to high noise which is generated due to the operation of compressors, generators, exhaust fans, grinding equipments. The purpose of noise monitoring is to ensure employees are protected from a high decibel (dB) of noise.

It is necessary to monitor the actual noise levels in the workplace for a periodic interval for workmen safety. High noise can also be generated from the faulty machinery which can be identified by periodic measurement of noise level of that particular machine or that particular zone. Various forms and sources of sound energy can be measured, e.g. Indoor/Work Zone Noise, Ambient Noise, DG Noise, Instrument Noise and Source Monitoring.

PARAMETERS COVERED

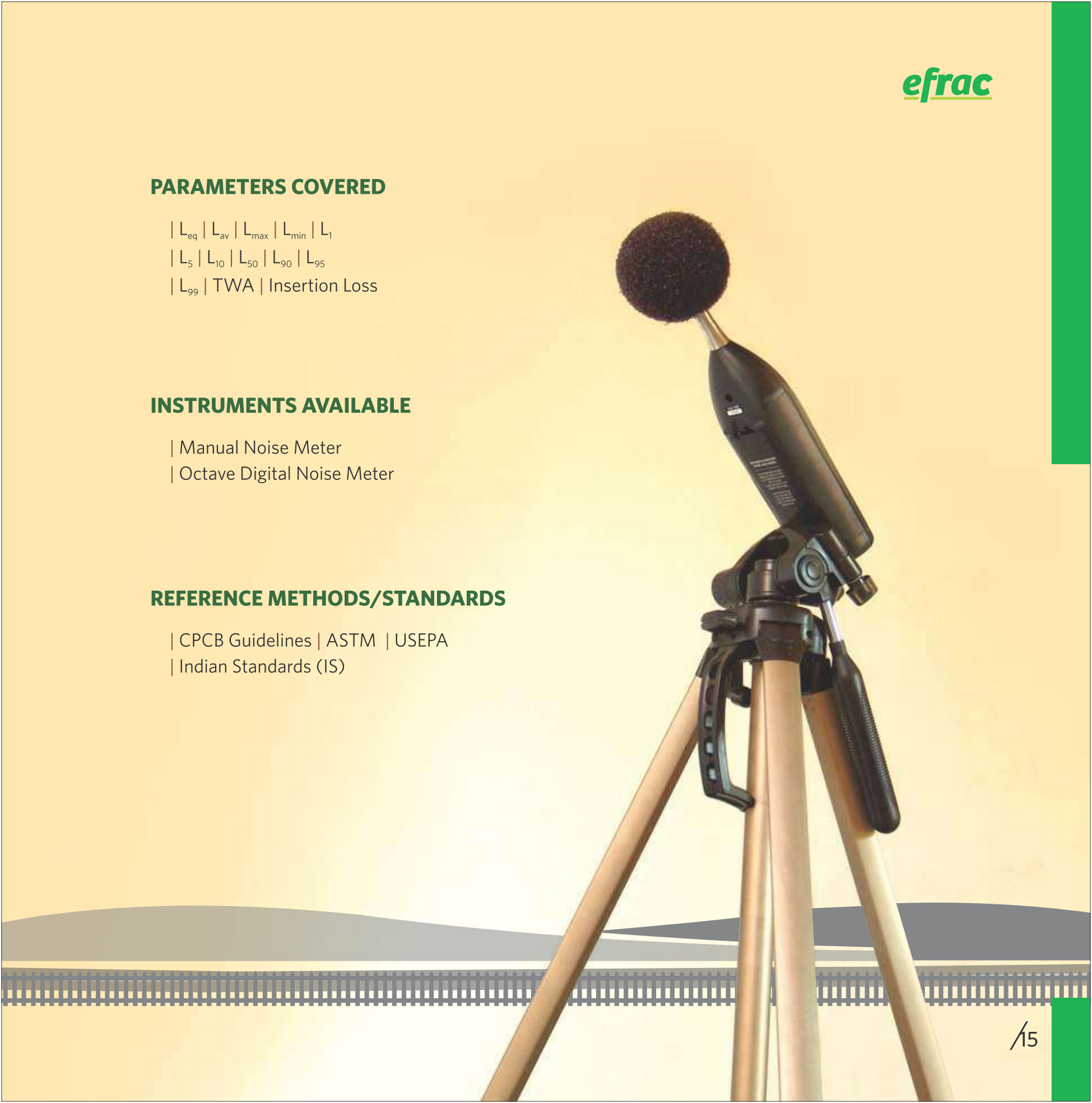
| L_{eq} | L_{av} | L_{max} | L_{min} | L_1
| L_5 | L_{10} | L_{50} | L_{90} | L_{95}
| L_{99} | TWA | Insertion Loss

INSTRUMENTS AVAILABLE

| Manual Noise Meter
| Octave Digital Noise Meter

REFERENCE METHODS/STANDARDS

| CPCB Guidelines | ASTM | USEPA
| Indian Standards (IS)



METEOROLOGICAL MONITORING

Due to extreme urbanisation and industrialization, the weather conditions are changing rapidly, causing severe concern to mankind. Combating the rapid change in weather is the biggest challenge for 21st century scientists.

Weather monitoring would help in keeping track of different climatic behaviours including Temperature, Humidity and Solar Radiation. Real time meteorological data is used to support a number of programs including public aviation, marine activity, agricultural activity, civil engineering, disaster management, rescue operation and R&D.

Weather Monitoring System can be either wired or wireless. In case of wireless communication, the connectivity will be more convenient and user-friendly even for the remote areas. We at EFRAC, provide the remote sensing real time meteorological monitoring facility for our clients.

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PARAMETERS COVERED

| Temperature | Humidity
| Barometric Pressure
| Wind Direction | Solar Radiation
| Wind Speed | Rain Fall
| Wind Rose | Dew Point

INSTRUMENTS AVAILABLE

| Automatic Weather Station

REFERENCE METHODS/STANDARDS

| CPCB Guidelines | US EPA

WATER TESTING

For sustainable development, "Water Management" is a challenging issue worldwide. Every development depends upon the quality and availability of water. To ensure proper management of this resources, it is very important to understand the quality of water and develop adequate action plans to reuse and recycle this natural resource.

Thus for a sustainable development, it is essential to conserve and maintain the quality of available water. It is the sole responsibility of individuals to save, reuse and recycle water in every stage and ensure that the water quality should meet the standards before discharge.

Plenty of fresh water is used worldwide every day in various sectors like Agriculture, Industries, Aquaculture, Recreations, Construction, Transportation, Research & Development, Drinking and Household purpose. But the water quality criteria vary widely depending upon the applications. The water testing laboratory of EFRAC is one of the most exhaustive and well-equipped divisions with highly trained professionals and state-of-the-art instrumentation and can analyze the water quality very precisely.

PARAMETERS COVERED

| Temperature | pH | Colour | Odor | Taste | Dissolved Oxygen | Conductivity
| Total Solids | Fixed Solids | TDS | TSS | Turbidity | Settelable Solids | SVI
| Acidity | Alkalinity | Salinity | Hardness | Carbon dioxide | Ammoniacal Nitrogen
| Kjeldahl Nitrogen | BOD | COD | Phenolic compounds | Oil & Grease | Cyanide | Metals
| Phosphate | Sulphate | Fluoride | Silica | Chloride | Residual Free Chlorine | Nitrite | Nitrate
| PCB and PAH | Pesticides | **Dioxins & Furans**
| Micro biological analysis like Salmonella, Shigella, Pseudomanas, Yeast & Mould, Clostridium, etc.

INSTRUMENTS AVAILABLE

| Turbidity Meter | Conductivity Meter | UV Visible Spectrophotometer
| AAS-VGA/GTA | ICP-MS | IC | LC-MS MS (QQQ) | HPLC-FLD/DAD
| GC-MS | GC-MS MS (QQQ) | TOC Analyzer | FTIR | pH Meter
| Micro & Semi Micro Balance | Real Time-PCR

REFERENCE METHODS/STANDARDS

| BIS | APHA | USEPA | Potable drinking water as per IS-10500
| Water for feed, boiler & condensate as per IS-10496
| Packaged natural mineral water as per IS-13428
| Water for industrial cooling as per IS-8188
| Packaged drinking water as per IS-14543
| Water for swimming pool as per IS-3328
| Water for feed & boiler as per IS-10392
| Water for irrigation as per IS-11624
| Water for food processing IS-4251
| Water as per WHO

SOIL TESTING

Soil is a fundamental and ultimate finite resource that fulfils a number of functions and services like Agriculture, Industrial Construction, Ecological Habitat Development, etc. Some of the most significant impacts on this resource occur as a result of activities associated with unlimited use of chemical fertilizers, non-scientific construction activity; unplanned city design, unscientific land use pattern and land filling by toxic materials.

The quality of the ground water depends upon the health of the top or sub soil. It is important to map the contaminated area by analyzing the top soil or sub soil and accordingly plan for the better management of this “Resource”.

Soil test can determine the fertility or the expected growth potential and it also indicates the nutrient deficiency and potential toxicity which helps in taking cost effective decisions about the use of fertilizer, irrigation water and the variety of seeds for better productivity. EFRAC has a separate division to analyze all the physical and chemical properties of soil, beside providing the technical interpretations and recommendations for various projects.

PARAMETERS COVERED

| Bulk Density | Specific Gravity | Porosity | Acidity
| Salinity & Alkalinity | Water Holding Capacity
| Field Capacity | Moisture | Texture | pH | Conductivity
| Total Carbon | Organic Matter | Available & Total Minerals
| Primary Nutrients | Secondary Nutrients | Micro Nutrients
| Metals & Trace Elements | Total & Available Nitrogen
| Available & Total Chloride | Sulphate | Nitrate | Nitrite
| Phosphate | Sulphur | Cation Exchange Capacity (CEC)
| Sodium Absorption Ratio

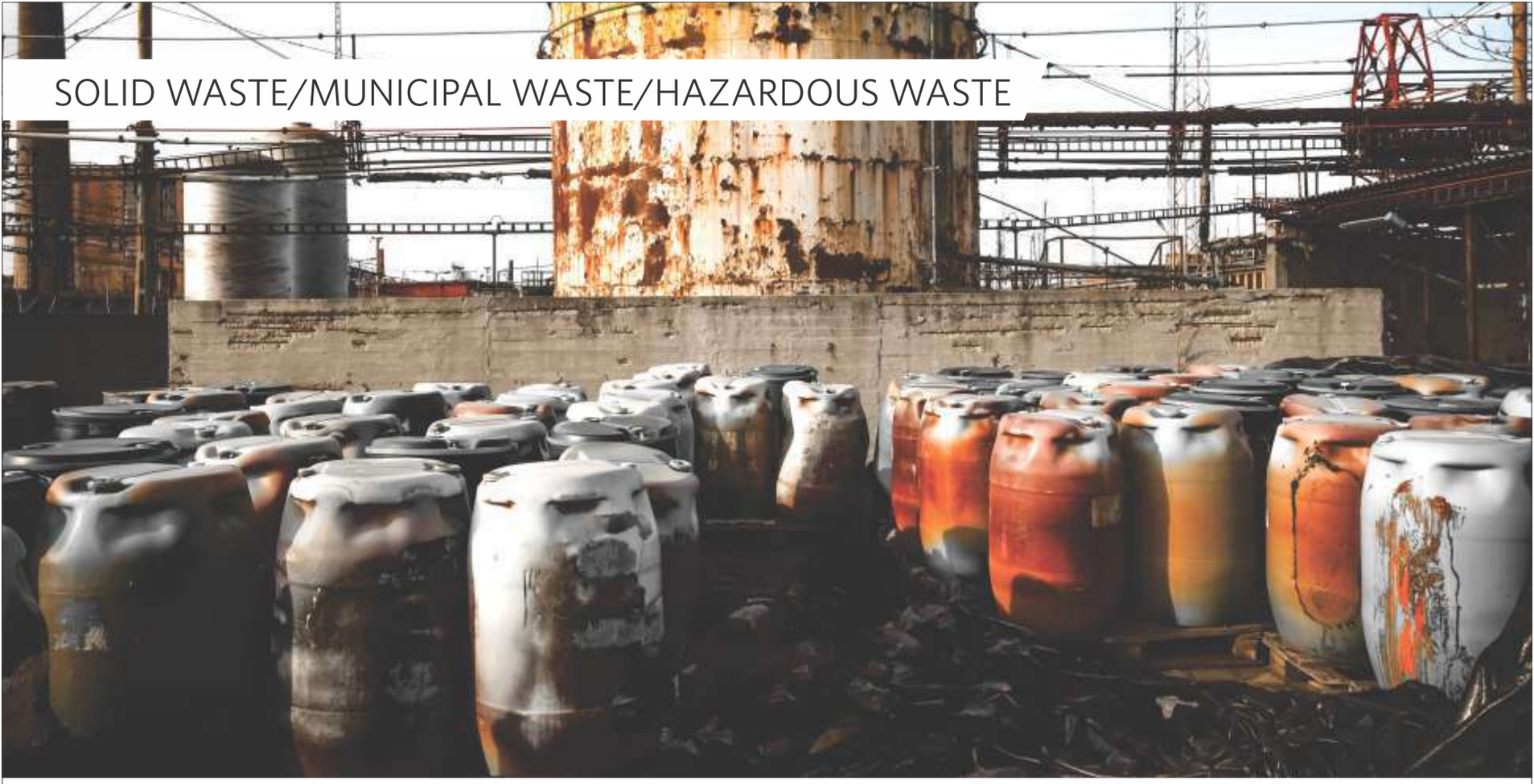
INSTRUMENTS AVAILABLE

| pH & Conductivity Meter
| Analytical Balance | Flame Photometer
| AAS-GTA/VGA | CHNS & O analyser
| GC-MS/MS | HR-GC HR-MS
| UV Visible Spectrophotometer
| ICP-MS | Auto Titrator & Coulometer

REFERENCE METHODS/STANDARDS

| Indian Standards (IS) | ASTM | ISO
| Internal Methods

SOLID WASTE/MUNICIPAL WASTE/HAZARDOUS WASTE



Hazardous waste is a waste that is dangerous or potentially harmful to our health and environment. Hazardous wastes can be liquids, solids, gases, or sludge and have the following characteristics:

1. Corrosiveness 2. Ignitability 3. Reactivity and 4. Toxicity, which should be handled, stored, transported, and disposed in a controlled manner. It is thus important to know the chemical characteristics of any kind of waste that may be solid waste/municipal waste/sludge/slurry/hazardous waste, before storage/incineration/land filling or for any kind of use or handling.

EFRAC is a well-equipped MoEF accredited laboratory to provide analytical services for the characterisation of the waste as per client's requirements or as per Schedule-I & II of "Hazardous Waste (Management & Handling) Rules 1989".

PARAMETERS COVERED

| Loss on Ignition | Ignitability/Flashpoint | Corrosivity/pH value
| Antimony | Arsenic | Beryllium | Cadmium | Chromium (VI)
| Mercury | Selenium | Zinc | Total Chromium | Cobalt | Copper
| Lead | Molybdenum | Nickel | Tin | Other Heavy Metals | Cyanide
| VOC & Semi-VOC | Ammonia | PCB and PAH | Dioxins and Furans
| Phenolic compounds | Bromates | Barium | Fluoride | Phosphate
| Chlorate | Nitrates & Nitrites | Sulphide

INSTRUMENTS AVAILABLE

| TCLP Shaker | Flash Point Apparatus | Bomb Calorimeter
| Viscometer | pH Meter | AAS-VGA/GTA | ICP-MS
| GC-MS MS (QQQ) | GC-MS | LC-MS MS (QQQ)
| HRGC HRMS | HPLC-FLD/DAD | CHNS & O Analyser
| Analytical Balance | Auto Titrator & Coulometer
| UV Visible Spectrophotometer

REFERENCE METHODS/STANDARDS

| CPCB Manuals | US EPA

COAL AND COKE TESTING

Coal is a fossil fuel which is formed from accumulation of dead plant matters in swamps and peat bogs which is converted into different forms like Lignite, Sub-Bituminous, Bituminous and Anthracite, through biological and geological processes over a period of time. It has many important uses worldwide like electricity generation, steel production to household cooking purpose.

Different types of coal have different uses. Steam coal, also known as Thermal Coal, is mainly used in power generation. Coking coal, also known as metallurgical coal, is mainly used in steel production. Gradation is very important for the specific use of coal. The gradations of coal are done on the basis of its Calorific Value, Ash Content and Moisture Percent.

It is therefore essential to determine the grade of the coal with respect to quality aspect prior to sell or purchase or use. EFRAC is a NABL accredited Laboratory offering a complete range of "Coal & Coke" analysis to meet all kinds of requirements for Producers, Exporters, Transporters and Users.

PARAMETERS COVERED

| Moisture | Volatile Matter | Total Ash | Fixed Carbon
| Volatile Matter | Particle Size | Ash Content
| Gross Calorific Value | Net Calorific Value
| Total Carbon | Nitrogen | Sulphur | Hydrogen
| Oxygen | Phosphorus | Heavy Metals
| Hard Grove Grind Ability Index | Free Swelling Index
| Specific Gravity | Wash Ability Characteristic

INSTRUMENTS AVAILABLE

| Bomb Calorimeter | HTE Furnace | Sieve Shaker
| Thermo Gravimetric Analyser | CHNS & O Analyser
| AAS-GTA/VGA | ICP-MS | Swelling Index Tester
| UV Visible Spectrophotometer

REFERENCE METHODS/STANDARDS

| Indian Standards (IS) | ASTM

CEMENT TESTING

Cement is produced by the calcination process of Lime Stone in the kiln and thereafter blended with additives. Cement is used as a principle material in any kind of construction projects like Construction of industrial infrastructure, Development of transportation system or may be of Housing complex, City development, etc.

Types of cement are - Ordinary Portland Cement | Portland Pozzalana Cement | White Portland Cement | Sulphate Resistant Cement | Portland Slag Cement | High Alumina Cement etc. It is essential to assure that all the physical and chemical qualities should meet as per the regularatory standards.

EFRAC provides world-class services to check the quality of Cement for producers and end users. We have a full-fledged division for testing of cements equipped with highly sophisticated modern and automated instruments and a team of highly skilled and professional scientists. EFRAC also offers analytical services for the testing of raw materials like Limestone, Fly Ash, etc. used in cement production.

PARAMETERS COVERED

| Loss on Ignition (LOI) | Insoluble Residue (IR)
| Silicon Di Oxide as SiO_2 | Alumina as Al_2O_3
| Magnesia as MgO | Ferric Oxide as Fe_2O_3
| Calcium Oxide as CaO | Chloride as Cl
| Sulphur Tri Oxide as SO_3 | Sodium Oxide as Na_2O
| Potassium Oxide as K_2O | Ammonium Hydroxide Group
| Titanium Di Oxide as TiO_2 | Zinc Oxide as ZnO
| Soundness | Fineness | Specific Gravity
| Drying Shrinkage | Compressive Strength | Setting Time
| Consistency | Whiteness | Heat of Hydration

INSTRUMENTS AVAILABLE

| AAS-GTA/VGA | ICP-MS | Analytical Balance
| Flame Photometer | UV Visible Spectrophotometer
| High Temperature Muffle Furnace
| Soundness Tester | Setting Time Tester
| Whiteness Tester | Hardness Tester

REFERENCE METHODS/STANDARDS

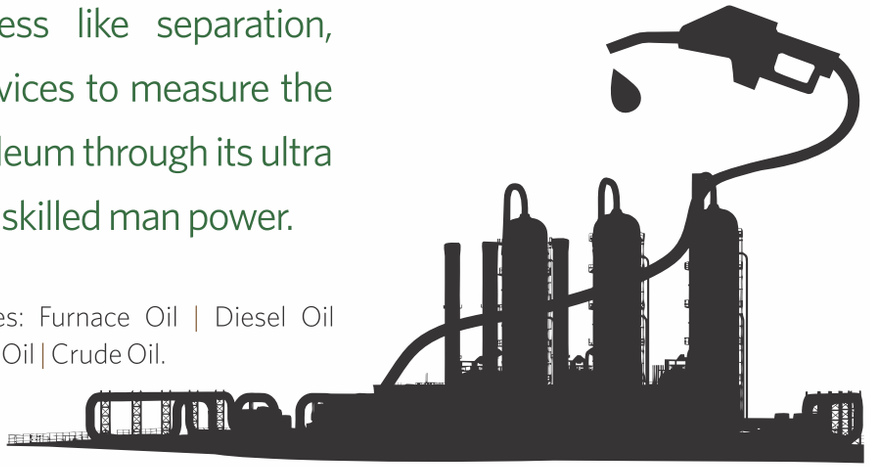
| IS | ASTM | ISO

PETROLEUM TESTING

Petroleum is formed by hydrocarbons with the addition of certain other substances, primarily Sulphur. Petroleum, usually named as crude oil, can be clear, green or black and may be either thin like gasoline or thick like tar. It is primarily used as fuel. Besides, it is also used in different sectors like transportation, drug & pharmaceuticals, chemical, polymer, different industries and power generation.

The crude oil cannot be used directly as it contents many impurities like sulphur, heavy metals, sediments, etc. It can be made useable through the refining process like separation, conversion, and treatment. EFRAC offers services to measure the physical and chemical characteristics of petroleum through its ultra modern sophisticated instruments and highly skilled man power.

Analytical services are provided for the following categories: Furnace Oil | Diesel Oil | Lubricant Oil | Gear Oil | Engine Oil | Kerosene Oil | Petrol | Used Oil | Crude Oil.



PARAMETERS COVERED

| Total Acid Number (TAN) | Total Base Number (TBN)
| Water Content | Flash Point | Fire Point | Viscosity
| Pour Point | Smoke Point | Gross Calorific Value
| Sulphur | Sulphated Ash | Sediment | Soot Analysis
| Coolant Dilution | Adulteration | Distillation Recovery
| Ramsbottom Carbon Residue
| Copper Corrosion Test | API Density

INSTRUMENTS AVAILABLE

| Auto Titrator | Flash Point Apparatus
| Viscometer | Density Meter
| Bomb Calorimeter
| Pour Point Apparatus
| ICP-MS | AAS-GTA/VGA
| Smoke Point Apparatus
| Auto Titrator & Coulometer
| Distillation Recovery Apparatus
| Ramsbottom Carbon Residue Apparatus, etc.

REFERENCE METHODS/STANDARDS

| ASTM | ISO | Indian Standards (IS)
| International Petroleum Test Method (IP)

BASE LINE DATA GENERATION/EIA/EMP
RISK ASSESSMENT/ENVIRONMENTAL AUDIT

Under the Environment (Protection) Rules, 1986 (and further notification in 2006), it is mandatory for the industries to submit the EIA/EMP reports to the "Ministry of Environment & Forest" for obtaining the Environmental Clearance (EC).

EFRAC has a team of experts to provide services like:

- Base Line Data Generation
- EIA/EMP Report Preparation
- Environmental Audit
- Waste Management & Audit
- Risk Assessment
- Safety Audit

INSTRUMENTS PREVIEW

Respirable Dust Sampler

PM 2.5 Sampler

Benzene Sampler

Handy Sampler

Gaseous Sampler

CO Analyser

Stack Sampler

Orsat Apparatus

Flue Gas Analyser

Dioxin & Furan Sampling Kit

Dry Gas Meter

Noise Level Meter

Lux Meter

Anemometer

Semi Micro Balance

Micro Balance

UV-Vis Spectrophotometer

Flame Photometer

Atomic Absorption Spectroscopy

Inductively Coupled Plasma - Mass Spectroscopy

LC MSMS (QQQ)

HRGC HRMS

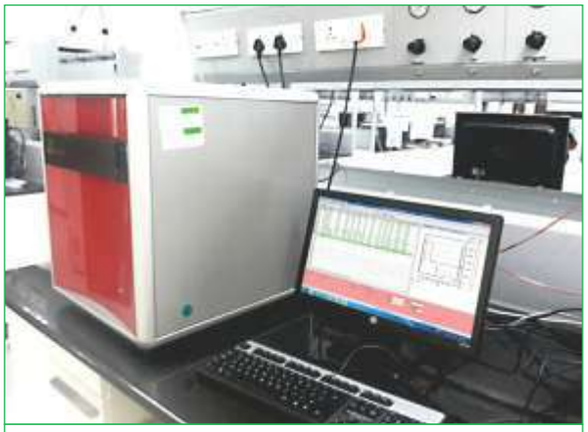
GC MS MS (QQQ)

GC MS

HPLC

Gel Permeation Chromatography

Ion Chromatography



CHNS & O Analyser

TOC Analyser

FT-IR

Digital Abbe's Refractometer

Densitometer

Turbidity Meter

Water Activity Meter

Biochemistry Analyser

Protein Digestion and Distillation

Auto Titrator & Coulometer

Brookfield Viscometer

Multi Rotaevapourator

Refrigerated Centrifuge

BOD Incubators

Millipore Filtration Unit

Turbo Evapourator

Biosafety Cabinet

Real Time-PCR

ELISA Reader

Bomb Calorimeter

PMCC Flash Point Apparatus

COC Flash Point Apparatus

Abel Flash Point Apparatus

Viscometer Bath

Fume Hood

Trace Lab

Environment Lab

For Analytical and Monitoring Related Enquiry Please Contact

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