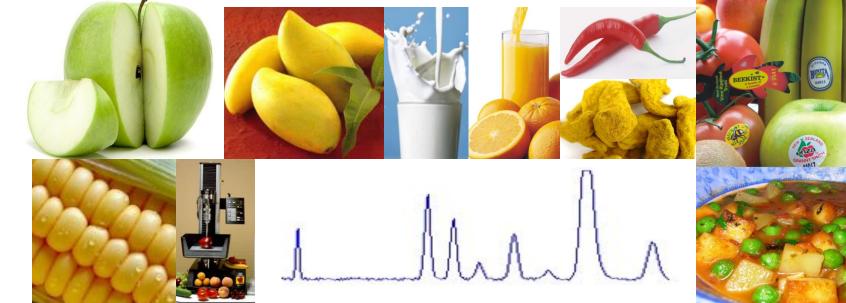
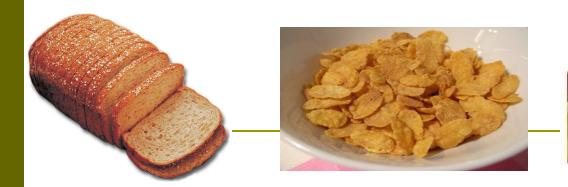


# FARE LABS Pvt. Ltd.

### A Brief Profile











#### Water Testing



#### & Indoor Air Quality Testing











# FARE LABS Pvt. Ltd.



L17/3, DLF Phase II, MG Road, Gurgaon, INDIA Phone: 0124-4034205, FAX: 0124-4036038 Email: farelabs@farelabs.com, Website: www.farelabs.com



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### Mission, Vision & Values

#### **Mission:**

• To become a source of national pride by contributing to the world of scientific and industrial research & development in the diverse areas of chemical, biotechnological & environmental technology

#### Vision:

- To assess the needs of scientific and industrial community on a continuous basis, and accordingly identify focus areas for research and development
- To generate technology and process improvement related knowledge for the benefit of industry, environment and public at large
- To regularly act as a bridge between the academic and industrial community, and facilitate a meaningful and mutually beneficial interaction between the same

#### Values:

- Integrity, accountability & client confidentiality
- Attention to issues of domestic and global relevance
- Appreciation of intellectual excellence & creativity
- An unfettered spirit of exploration, rationality & enterprise



### FARE Labs : An Overview

#### **Accreditations, Recognitions & Certifications**

- □ Accredited by NABL (*National Accreditation Board of Laboratories, the Indian body of International Laboratory Accreditation Cooperation (ILAC),* the highest international accreditation body of laboratories & AERB (*Atomic Energy Regulatory Board*)
- Recognized by BIS (Bureau of Indian Standards), DSIR (Department of Scientific and Industrial Research), MOEF&CC (Ministry of Environment, Forest and Climate Change), HSPCB (Haryana State Pollution Control Board), PPCB (Punjab Pollution Control Board)
- Authorized by **FSSAI** (Food Safety and Standards Authority of India)
- Certified by OHSAS 18001 (Occupational Health and Safety Assessment Series), ISO
   9001 (Quality Management System), ISO 27001 (Information Security Management System) & ISO 14001 (Environment Management System)



### Accreditations, Recognitions & Empanelments

#### **National Reference Lab**

- FARE Labs has been awarded the status of National Reference Lab by the Food Safety And Standards Authority of India (FSSAI) in 2019
- It is the only private, non-govt. laboratory in India that holds this prestigious position in the oils and fats category for capacity building to support the growth of food sector in India



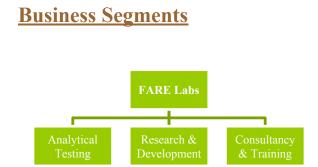


### FARE Labs : An Overview

- ☐ Founded in 1999 and based out of Gurgaon, FARE Labs is promoted by Mr. D Mathur & Mr. C.S Joshi, a team of chemical engineers with combined industry work-experience of over 55 years
- Accredited by NABL\*, recognized by FSSAI\*\* & MoEF and certified by OHSAS\*\*\*, FARE Labs has world-class competencies in Analytical Testing and Research & Development
- □ Spread over more than 60,000 sq.ft., FARE Labs houses state-of-the-art, modern laboratory instruments and equipments, sourced from market leaders such as Perkin Elmer, Shimatzu, Agilent, Merck & [Thermo], etc.
- Over a period of years, FARE Labs has developed strong long-term relationships with its customers, including many leaders from domestic & global Companies, International NGOs & Govt. bodies

\*National Accreditation Board of Laboratories, the Indian body of International Laboratory Accreditation Cooperation(ILAC), the highest international accreditation body of laboratories

- \*\* Food Safety and Standards Authority of India.
- \*\*\*Occupational Health and Safety Assessment sequence 18001



#### **Industry Verticals**

- □ Food and agri
- □ Fats, oils, and allied products
- □ Water
- □ Fuels and bio-fuels
- **Pollution and environment**
- □ Essential oils and cosmetics
- □ Soaps, detergents, and toiletries
- □ Packing materials
- Petroleum and lubricants
- □ Industrial and fine chemicals
- □ Soil strength



### Our Services

#### **Analytical Testing**

- □ Sampling and inspection
- □ Routine commercial testing
- □ Adulteration testing
- □ Third party testing
- □ Testing for regulatory requirements
- □ Certification related testing
- **Testing for nutrition labels**

#### **Consultancy & Training**

- □ Annual consultancy contract
- Operations related trouble-shooting
- □ Training for fresh recruits
- □ Training for experienced personnel
- □ Test/instrument/product specific trainings
- □ Subject specific presentations
- □ Process and quality audit

#### **Research & Development**

- Image: Quality development
- Product development
- Technology development
- Development of new testing protocols
- □ New compound isolation & quantification
- □ New quality parameter establishment
- Development of lab management systems

#### **Additional Services**

- □ Annual lab operation contract
- □ New laboratory setting up
- Up-gradation of existing laboratories
- □ Event management (seminars/work-shops)
- Placement services for lab personnel
- □ Liaison with Govt. bodies for clients
- □ Lab support to damage/ loss surveyors

#### FARE Labs Corporate Membership Plan

□Flagship scheme of FARE Labs that provides a one-stop shop for all its clients' technical problems □All the above services are provided on a preferential basis at a discounted pricing



# Analytical Testing

FARE Labs understands the strategic importance of Analytical Testing to business performance and sustainability and has developed rigorous processes and systems to ensure precision in all the following constituent steps :

Sampling	Testing	Data Generation	Inference	Decision Input
<ul> <li>Being the first step, considered highly important – depending on client situation, suitable procedures are designed with focus on:</li> <li>Container</li> <li>Instrument</li> <li>Add on chemicals, if any</li> <li>Transportation</li> <li>Storage</li> </ul>	<ul> <li>Standard operating procedures have been designed for every individual test to minimize uncertainty levels.</li> <li>Proficiency testing done at an inter laboratory level globally. FARE Labs rank among the Top 20 in the world .</li> <li>Instruments &amp; apparatus calibrated through authorized world class agencies.</li> </ul>	<ul> <li>Software designed to generate data in customized formats, for better assessment.</li> <li>Data storage &amp; system maintenance to ensure proper tracking.</li> </ul>	<ul> <li>Strong industrial expertise combined with customized data generation enables to go beyond testing.</li> <li>Genuine direction provided to client on the basis of testing</li> </ul>	• A holistic solution is recommended by bringing together knowledge and expertise from other engineering concerns in the Group
	:			10



# Research & Development

- FARE Labs, a certified SIRO\* organization, is committed to conducting cutting-edge industry oriented research, aiming at problem-solving through innovative solutions
  - Our R&D recommendations are implemented by the industry on a regular basis
  - □ Our sister engineering company, with a wide industrial experience, collaborates with FARE Labs to scale up research recommendations into commercially viable technologies
- Over a period of years, FARE Labs has put together a team of well-qualified scientists, coming from leading institutes such as ITRC (Lucknow), NBRI (Lucknow), IIT Kanpur, HBTI (Kanpur), Delhi University, Punjab Agricultural University (Ludhiana), GNDU (Amritsar)
- Research Advisory Board constitutes of eminent professors from leading institutes such as Delhi University, IIT Kanpur, Jamia Milia (Delhi), Calcutta University, Bombay University, HBTI (Kanpur), IIP (Dehradun)



\* Scientific & Industrial Research Organisation, awarded by Directorate of Scientific and Industrial Research, Ministry of Science & Technology, Govt. of India



## Consultancy & Training

- ☐ The Consultancy division assists its clients in meeting their various manufacturing process, technology, and quality related requirements
- □ FARE Labs is uniquely placed to provide consultancy services because of the knowledge it regularly gains from its other divisions (Analytic Testing & R&D), & its sister engineering firms that work as suppliers of plant & technology
- □ FARE Labs provides consultancy for laboratory set-up in microbiological, chemical, environmental & pollution streams
- □ FARE Labs also assists laboratories in applying and preparing for various national & international accreditations
- FARE Labs provides Training services for Laboratory & Manufacturing personnel
  - □ Short-term refresh courses for experienced personnel
  - □ Beginner programs for fresh recruits
- ☐ Training programs can be co-coordinated at client site or FARE Labs premises depending on client needs

#### **Prior Experience**

- □ C2C\* Projects
- Process Audit & Improvement
- Quality Audit & Management
- Energy Efficiency
- Effluent Treatment
- Environment Management
- □ Yield Improvement
- Production Cost Management
- □ Capacity Utilization
- □ Inventory Management



### Corporate Membership Plan

#### **Key Benefits**

- □ Free preliminary information to all queries (communicated through phone/mail)
- A one-stop shop, always committed to your cause
- A substantial price discount on the services offered under this scheme
- Access to our wide database of knowledge
- Preferential, out-ofturn treatment for commercial analysis and testing
- Round the clock support

An attractive opportunity to enter into a lifetime relationship with Fare Labs under which our full range of technical services shall be provided at a discounted pricing on a preferential basis

#### Services under the Scheme

- Project Consultancy
- **Technical Consultancy**
- Laboratory Process Improvement Advisory
- □ Sample analysis and testing
- Sponsored R&D Liaison with various Government departments on technical subjects
- □ Inter-laboratory & Proficiency Testing Program
- □ Organizing sponsored seminars/conferences/workshops
- **D** Technical Personnel Placement
- Laboratory personnel training (including on-site trainings for specific jobs)



### Core Team



Mr. D. Mathur **Executive Director** 



Mr. C.S Joshi **Director - Operations** 



Ms. M. Tripathi President

- With over 30 years of experience in various chemical engineering industries in diverse roles such as O&M\*, QC&A, R&D and Project Implementation, has developed an insight to interpret sample results and identify both process rectification & improvement opportunities
- Has developed acumen to devise efficient solutions to complex real time problems
- Bachelor of Chemical Engineering, H.B.T.I., Kanpur. •

- With 20 years of experience in various chemical engineering industries has developed a unique ability to identify key process/quality related problems
- Spearheads the implementation of FARE Labs recommendations at client's shop floor
- Bachelors Degree in Chemical Engineering from H.B.T.I., Kanpur •

- Responsible for planning, developing and execution of FARE Labs projects
- Selection, standardization and supervision of analytical processes of Laboratory. Implementation and monitoring of the quality and technical management system in laboratory by creating control loops and improvement cycles. Ensuring compliance of national and international accreditation requirements in the laboratory.
- Doctorate degree in Biochemistry from ITRC, Lucknow (CSIR, India)



Π





The Projects covered the studies on Absorbability quotient and spread ability of Cargill variants against other oils available in market. Our commendable work instigated them to advertise us as there USP on television and print media. A regular testing of various products of Cargill has been a routine part of our testing services.

As a part of this assignment, a range of Cargill cooking oils, under the brand Nature Fresh, are being thoroughly and objectively tested and certified for quality by Fare Labs. The seal of certification were prominently displayed on the packaging of Nature Fresh. The same were also communicated on television through a large scale national campaign sponsored by Cargill.

Chain of Yum restaurants availed our services for testing there wheat flour, oil, water, food. Our important projects for yum include the evaluation of the shelf life of fruit juice stored in two different containers and at two different temperatures. Our tests included TPC and Y&M as well as the swabs of the containers in order to evaluate the shelf life of the samples.
 *"Impeccable Service "*

Sumon Mukherjee (Manager-QA)







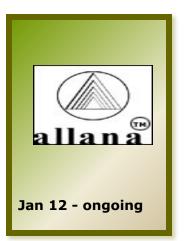
Mr. Dinesh Agrawal, COO, Dhara.

- FARE Labs in collaboration with Dhara entered an R&D project and developed 'The Low Absorb Technology'. The food absorbs less oil by the introduction of 'Low Absorb Technology' It also ensures that the nutritional loss is less compared to normal oils. The oil also retains the quality for longer period than compared to regular sunflower oils. Dhara's Health fortification with Vitamin A & D was also done so that the health of the consumers can be guaranteed.
- "The 'Low Absorb Technology' is the outcome of the hard work of our R&D & product team who collaborated with FARE LABS Pvt. Ltd. (A leading independent NABL accredited and FSSAI Authorized food testing laboratory) to conduct a comprehensive study before introducing it in Dhara Health. As per the findings of the study, new Dhara Health absorbs 19.8 to 21.8 % less oil (tests conducted by frying besan bhujiya and Lady Finger) as compared to regular sunflower oil. Dhara Health's fortification with Vitamin A & D is in continuation with the company's commitment to provide healthier options to consumers. Apart from the food absorbing less oil, the introduction of 'Low Absorb Technology' ensures that the nutritional loss is less compared to normal oils as per the study conducted by FARE LABS Pvt. Ltd. The oil also retains the quality for longer period than compared to regular sunflower oil".

Business Standard (Announcement / Corporate Jul 05, 2012, 19:22 IST)







- The LaLiT has been among our prime clients because of our Quality Regime. We have been doing the analytical testing for The LaLiT Jaipur at regular intervals. The sampling is done as per Indian Standard sampling procedures. Safety steps were taken for storage in order to maintain the microbial growth and special facility to transport was also arranged. Some tests are done according to International Standards. Hand swab and area swab are also done at definite intervals.
  - You guys are quick to respond, accurate and genuinely interested in customer service. Before assigning you the responsibility I was hoping that FARE Labs be just a fair deal for me but you turned out to be EXCELLENT"

#### Imtiaz Jawed (Manager-Food Safety and Hygiene

Allana being among the largest meat exporter of the country require our certificate affirmation to export its meat products from India. Our timely and 24\*7 services have built strong relationship with Allana and thus all certification for exports are provided by us regularly. The raw products (fresh meat), finished products (frozen meat) and by-product (meat bone etc.) send to us by Allana come via a reputed sampling and inspection agency operating world wide. **Our endurance and consistent accuracy in Microbiological testing has put us forth among our competitors that our results are widely accepted**. We endorse an annual contract with those agencies for testing there quality products before exports.

"Excellent and reliable services and a prompt response" Akbal Khan (QA manager)

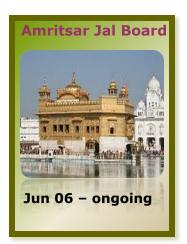




- Devyani International has been our prime and regular client since the year June 2011. The projects of Devyani has been for Creambell, KFC, Pizza Hut, Costa Cafe. We are testing 175 stores for Devyani at present. The key feature is that we are providing services to R&D department of Devyani and also provide valuable recommendations to enhance there product quality, thus providing them our holistic solutions. Our sample collection centers spread across India collect samples from them. The samples collected at the stores all over the country are sent to the laboratory through air cargo by our sampling specialists. We also test there drinking and process water according to the Bureau of Indian Standards. **The analysis focuses on physical parameters, pesticide residues and microbiological parameters. A complete set of microbiological parameters are tested for Devyani International in process water according to IS-4251.**
- "These people have clear understanding of testing process and they are able to put their learning's into the projects assigned to them. They bring in the right attitude towards there work which is highly needed in a good professional."

Pramod Guleria (QA manager)





Conducted sampling and quality analysis of drinking water in the cities of Amritsar, to assess

- Quality of source water,
- Performance effectiveness and efficiency of water treatment plants,
- The degree of contamination during distribution through pipelines, and
- To identify the location of contamination
- Evaluated the existing water testing laboratory facilities of respective State Governments to assess capacity shortfalls, and subsequently built adequate capacities for the short and mid term period. The quality of water was tested on the basis of physical, chemical, microbiological parameters and pesticide residues.



An Indian tamarind seed gum major Product quality improvement by process and technology development

Aug 03 - Jul 05

Reduced gum particle size and made it soluble in cold water by

- Additional chemical treatments, and
- Introduction of advanced crushing techniques
- The project helped the client in enhancing his product value proposition, thereby significantly increasing the product pricing, and overall sales & profitability

A leading Indian walnut exporter

Brought down initial microbial load and its further growth in the packed product

Sep 06 - Aug 07

- Brought down initial microbial load and its further growth in the final packed product (processed walnut) to ensure its quality as per international quality standards
- Identified the pre-treatment process of de-hulling as the key problem area and significantly modified the same
- □ Introduced additional processing measures to ensure reduced microbial growth both, in process and on shelf
  - The project helped the client by enhancing the acceptability of the product in the international market, thereby increasing the Company's revenues



A group of leading Indian engine oil re-processors

New technology development based on processes approved by MOEF, GoI\*

Apr 03 – Apr 04



□ Developed new technology based on the total distillation process as per the guidelines of MoEF\* and CPCB\*\*

- FARE Labs was the first in India to design the technology, and the same was then widely accepted by the industry
- Plants based on the said technology were then successfully designed, manufactured, and installed on turn-key basis by FARE Labs in collaboration with SPPS, its group engineering company

Subsequently, SPPS has successfully installed many such plants for various industry players in almost all parts of the country

- The technology was also suitably modified for transformer and turbine oil
- Studied the constituents and characteristics of the rare plant seeds available in Chhattisgarh forests, and assessed the potential of manufacturing value added products from the same
- Identified economically feasible value added end-products that could be manufactured from the said plant seeds
- Recommended suitable process and technology for industrial manufacturing of the same

\* Ministry of Environment and Forest, Government of India

\*\* Central Pollution Control Board, Government of India



A group of leading Bangladeshi food companies Training Program on quality control & assurance, and good laboratory practices

Dec 07 - Jan 08



Identification of reasons behind large fluctuations in product quality

#### Apr 06 – Mar 07

- Designed a training program for leading Bangladeshi food companies for their specific needs and requirements
- □ Detailed hand-outs and notes were provided to the candidates during the training program
  - Included a detailed written, oral, and practical examination to assess the effectiveness of the training program, and to address the limitations of each candidate
    - A total of 20 candidates received training under the program conducted at all the manufacturing facility locations of the client
    - Identified the following as key problem areas:
      - Irregularity in raw material quality, and
      - Non-uniform manufacturing processes at different factories
- Recommended suitable solutions to achieve consistent/desired product quality:
  - Selected preferred vendors for the company, and
  - Standardized manufacturing process at different factories



An Indian edible oil major Annual training and audit under the

> FARE Labs Corporate

Membership Plan

Jan 06 - ongoing

Conduct training and audit on an annual basis under the FARE Labs Corporate Membership Plan

Over the last three years the client has been able to develop efficient and effective systems for quality and technical management

□ The client has witnessed an increased meaningful contribution by the laboratory to the procurement, production, and marketing teams

A Dubai based food & agri

commodities trading company

Regular testing and analysis of saffron, paneer\*, honey, spices, and herbs

Jan 06 – ongoing

- Developed quality benchmarks for grading each product, in addition to existing specifications
- Regularly conduct testing and analysis against the said specifications and benchmarks to classify products in different quality grades
- Perform nutritional labeling for products sold through the retail channel

\* Indian cottage cheese ......



A leading foods company present in India, Nepal, Sri Lanka, and Bhutan

Training Program on increasing integration of lab with the production department

Nov 06 - Oct 07

- □ Designed a training program for the laboratory personnel to ensure superior inputs from them to the production team, to achieve better product quality, and lower processing costs
- □ Cross-functional training program candidates included the top management from laboratory and production streams
- □ A separate training program was delivered to the fresh recruits with no prior experience
  - A total of 50 candidates received training under the program conducted at all the manufacturing facility locations of the client

An Africa based cosmo-lipids manufacturer

Regular testing and analysis of shea and cocoa butter

- Regularly conduct testing and analysis to classify products in different quality grades
- □ Identified the main quality shortcomings and recommended suitable process modifications to overcome the same



A large Indian business conglomerate

Developed a suitable cattle feed product through advanced recipe engineering

Apr 02 – Mar 03



Annual contract for regular testing of ghee, butter & condensed milk powder

Sep 08– Ongoing

- □ Identified potential feed constituents available commercially in the North Indian market
- Conducted a detailed chemical and nutritional study of the identified potential feed constituents
- Developed product at laboratory level though recipe engineering the product was approved by a Fortune 50 MNC, and the client entered into a long term sale contract with the MNC for the same
  - Standardized the process, and recommended plant configuration for commercial production
  - These companies send on a daily basis, samples from the various consignments of milk, ghee and butter bought from different sources
  - Fare Labs checks quality parameters of these products, which allows the company to decide its pricing, as pricing is a direct function of quality.



A South India based large biotech company			
Bio-fuel development from a combination of different feed-stocks			
Apr 07 – Ongoing			

- Different feed-stocks, and their various combinations, were used for manufacturing bio-fuel, and the end-product quality was compared against internationally accepted quality standards
- Standardized the manufacturing process for the developed feed-stock
- Currently working on developing value-added products from the co-products and by-products that come out as a part of the process

A leading Indian paints company Improved an existing effluent treatment plant, located in North India, to achieve zero effluent discharge

Apr 05 – Mar 07

The plant was already meeting and exceeding the norms laid down by the Pollution Control Board even without our assistance – however, the client wanted to make its plant a **Zero Effluent Discharge** plant



Largest North India based soaps & detergent company

Testing of heavy metals and microbial load

#### Jun 08 – Ongoing

- This company does routine testing of heavy metals and microbial load of its soaps and detergents
- It does quality and shelf life testing of new products like bathing soap introduced recently in its portfolio
- It checks the industrial effluent produced in its plants regularly, for conformation to CPCB (Central Pollution Control Board) norms.
- FARE Labs also does a check of the packing materials of the products



An overseas

microbes

Jan 08- Dec 08

- This company produces biofuels with overseas assignments
- Microbial conversion of organic matter to methane gas is carried out for waste treatment and resource recovery. This process is anaerobic and is carried out by action of various groups of anaerobic bacteria
- FARE Labs carry out analysis of microbial diversity (mainly anaerobes) in biogas digesters



The largest Indian beer company Routine testing of beer and beer can quality

Nov 08 – Ongoing

This company does routine testing of beer quality

- The company's beer cans have been facing a problem of leakage, and Farelabs has been involved in defining the cause of this problem
- Discussions are on for 3<sup>rd</sup> party testing of vendor purchased raw materials and ingredients for beer, like barley etc.

Indian Spices, herbs & salad dressing company

3<sup>rd</sup> party quality audit & new product development

Sep 08– Ongoing

New product development and recipe engineering

- 3<sup>rd</sup> party quality audit to check whether products conform to their own standards and the PFA (Prevention of Food Adulteration) standards
- Farelabs does the nutritional labeling of products for the company developing the correct formatting and analysis and testing for nutritional labeling



A Global food & agri business MNC Soya meal testing & raw, refined, modified oil testing Oct 05 – Ongoing

- For soya meal, FARE Labs does the testing of heavy metals, microbial load, pesticide residues and toxin, a rare and complicated testing
- □ For refined and modified oils, FARE Labs does the testing of trans-fats and the shelf life of the oil, and predicts the shelf life behavior
- For raw oil, tests are conducted on the purity and product quality of the oil purchased by the company from various vendors

North India based oleo – chemical company

Addressal of quality, capacity utilization & efficiency of its plant

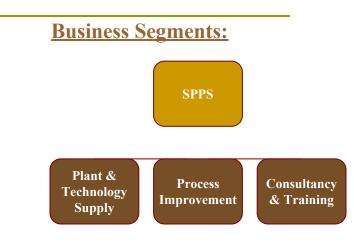
Sep 08– Ongoing

- FARE Labs did the complete survey of raw materials, plant and processes to identify shortcomings and suggested and implemented corrections
- As a result of this, the company was able to achieve its desired quality level in products
- Recommendations were also given for total utilization of plant capacity and perfect efficiency



### SPPS: An Overview

- Founded in 1999 and based in Gurgaon, SPPS is promoted by Mr.
   D. Mathur & Mr. C.S Joshi, a team of chemical engineers with combined industry work-experience of over 51 years
- □ Since inception, SPPS has successfully completed over 50 projects in countries such as India, Nepal, and Bangladesh
- SPPS has worked with many reputed global clients such as Micro-nutrient Initiative, Global Alliance for Improved Nutrition, Japan Bank for International Co-operation, etc.
- □ SPPS currently employs over 100 people, including experienced engineers, senior research scientists, project managers, supervisory personnel, and skilled labour
- □ SPPS has the unique capability to provide end-to-end project management solutions, including services such as civil construction, utilities supply and installation, effluent treatment, co-products and by-products production, development of quality management facilities, etc.
- □ To manufacture process equipments, SPPS uses its own workshop, and a network of other associate workshops with whom SPPS has build long term priority relationships
  - Some equipments are also manufactured on-site



#### **Industry Verticals:**

- Oils & fats
- Bio-fuels
- □ Oleo-chemicals
- □ Soaps & detergents
- Compound cattle feeds
- □ Water treatment
- □ Environmental engineering
- Effluent treatment
- □ Waste recycling



# Our Strengths

#### **Promoter Team Involvement**

- The promoters of FARE Labs have a strong understanding of Quality, having had deep knowledge & experience of the industry
- Their involvement in operation and execution ensure that their combined experience adds more weightage to the results

#### **Strong engineering capability support**

- In addition to testing and analysis, FARE Labs can identify process/quality improvement opportunities and suggest solutions to the problems at hand.
- Strong in-house implementation support from our group company, SPPS, with regard to our recommendations

#### Highly qualified staff members

- □ The staff at FARE Labs are handpicked from among the best of industry
- The analyst staff are post graduates & doctorates, compared to the normal graduates employed in parallel laboratories.
- Only commercial lab in the country to boast of IIT & IIM members in the team

#### Satisfied clientage

- Till date, all clients of FARE Labs have done repeated testing, confirming the fact that the results are accurate and lead to results
- We take all measures to customize solutions to client needs, to ensure complete customer satisfaction, and therefore repeat business.

#### **Exploring uncharted territories**

We do not hesitate in taking up challenging assignments, which most laboratories refuseWe are currently involved in certain R&D projects that are not commonly done elsewhere in India







































#### Unit-2

- 1. Calibration & Research Division
- 2. Radioactivity Testing Lab
- 3. Petroleum, Coal/Coke, Paper & Packaging and Plastic Testing





# **FARE Labs Pvt. Ltd.** (Calibration & Research Division)

- Thermal Metrology Section

   (Contact & Non-contact Measurement, SPRTs, RTDs, LIGT, TC, IR-Thermometry, Hygrometry )
- Mechanical Metrology Section

   (Mass, Volume, Density, Viscosity, Pressure, Acceleration and Speed)
- **Electro-Technical Section** (AC/DC Voltage, Resistance, Current and Frequency)



## Calibration & Research Division

# Thermal Metrology Section Range of Temperature Calibration Contact Calibration: (-196 °C to 1200 °C) Non-Contact Calibration: (-15 °C to 3000 °C)



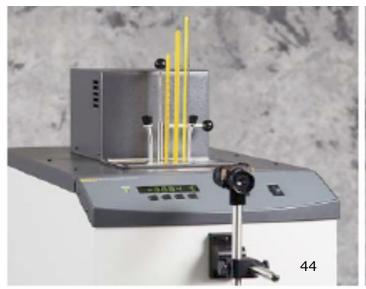
#### LIGTs & RTDs Calibration

- LN2 Fixed Point (-196 °C)
- Low Temperature Variable Bath (-180 °C to -80 °C)
- Low Temp Alcohol Bath (-80 °C to 50 °C)
- Silicon Oil Bath (50 °C to 300 °C)
- Precision Dry Well Calibrator (50 °C to 700 °C)





Calibrating a glass Thermometers





#### **Contact Thermometry**

High Temperature Thermocouple Calibration







Tube Furnace Carbolite-Gero, UK (100 °C to 1800 °C)



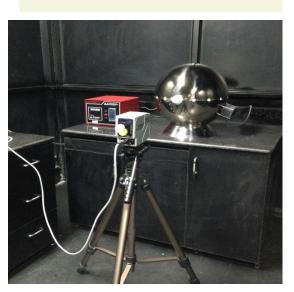
#### **Blackbody Radiation Pyrometry**



Surface Type Blackbody Radiation Calibrator -15 °C to 120 °C & 35 °C to 500 °C



Spherical Blackbody Radiation Source 50 °C to 1300 °C





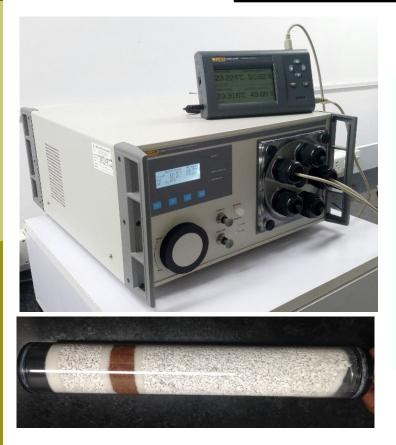
Non-contact Thermometry

Radiation Temperature Blackbody Source 600 °C to 3000 °C





## **Humidity Calibration**

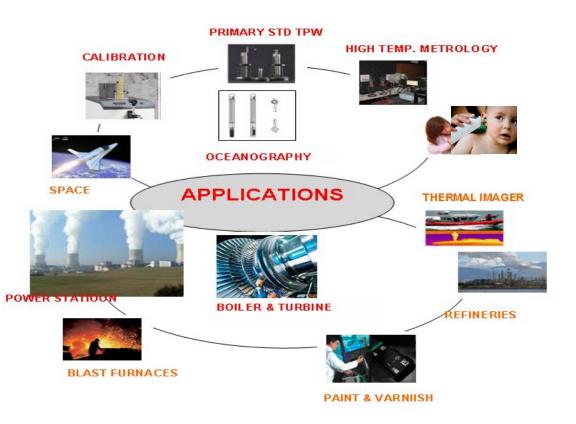


Hygrometer/Humidity Meter Calibration Facility
Humidity: 7% RH to 95% RH @ 25 °C
Temperature: 10 °C to 50 °C @ 50% RH



#### Application of Temperature Metrology

- Metrology Institutes
- Medical Science
- Defence & atomic energy
- Thermal Power Plants
- Automobiles
- Metallurgy
- Aviation
- Space Research
- Oceanography
- Environment
- Weather Forecasting
- Food & Agro Industry
- Electronics Industry
- Oil & Gas Refineries





### Mechanical Metrology Section

#### **Facilities**

Mass:1mg to 300 kgVolume:1 $\mu$ L to 500 mL & up to 5000kLDensity:0.6g/mL to 2g/mLViscosity:0.001 mm²/s² to 100 mm²/s²Pressure:-1 kg/cm² to 700 kg/cm²

Balance Mettler Up to 1kg, read. 1mg



Balance Mettler Up to 50 g, read. 1 μg Up to 1kg, read. 1mg





## Mechanical Metrology Section

# <section-header><image>

Density: Viscosity: Pressure: 0.6g/mL to 2g/mL  $\checkmark$ 0.001 mm<sup>2</sup>/s<sup>2</sup> to 100 mm<sup>2</sup>/s<sup>2</sup> -1 kg/cm<sup>2</sup> to 700 kg/cm<sup>2</sup>



## Electro-Technical Metrology Section

#### **Electrical Parameters**

Source Mode:

- DC Voltage: 1mV to 1020V
- DC Current: 100 μA to 20A
- $\square$  Resistance: 1  $\Omega$  to 1.1  $G\Omega$



- Temp Simulation: for all TCs and RTDs
- **DC Power: 33mV to 1020V/3.3mA to 20A**
- AC Voltage: 3mV to 1020V(45 Hz-10kHz)
- Δ AC Current: 33µA to 20A, with coil 1000A (45 Hz-1kHz)
- AC Power: 33mV to 1020V/3.3 mA to 20.5A (50Hz)
- Frequency: 119 Hz to 100 kHz
- Capacitance: 220 pF to 1µF



#### Electro-Technical Metrology Section

#### **Electrical Parameters**

- Measure Mode:
- DC Voltage: 1mV to 1000V
- DC Current: 1mA to 20A
- **Resistance:** 1  $\Omega$  to 10  $G\Omega$
- Temp Simulation: for all TCs and RTDs
- **DC** Power: 33mV to 1020V/3.3mA to 20A
- AC Voltage: 1mV to 1000V (50Hz to 20kHz)
- **AC Current: 100μA to 20A (50Hz to 5kHz)**
- AC Power: 33mV to 1020V/3.3 mA to 20.5A
- **Frequency: 10 Hz to 1MHz**







### Contact Us

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### Thank You