



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH BENGALURU

(A UNIT OF SHRIRAM SCIENTIFIC AND INDUSTRIAL RESEARCH FOUNDATION)

Analytical Science Division (ASD)

Functional Areas for DRUGS & COSMETICS

Drugs and Pharmaceuticals

Products

Antibiotics, Bioassays of Other Products (Other Than Those Products Mentioned Above), Chemotherapeutic Agents, Drug Intermediates, Drug Substances (API), Filterable Solutions & Soluble Preparations, Immunological Products, Non-Filterable Preparations Including Ointments, Preservative efficacy, Raw Materials, Synthetic Drugs, Veterinary Drugs

Test Parameters

Microbial Limit Test, Total Aerobic Microbial Count, Total Yeast & Mould Count, Salmonella, Staphylococcus aureus, Sterility Test, Bioburden Test, Microbial Assay, Bacterial Endotoxin Test (Gel-clot method), Bacterial Endotoxin Test (Chromogenic Kinetic method), Anti-microbial Efficacy Test.

Test Method

- Indian Pharmacopoeia
- United States Pharmacopoeia
- British Pharmacopoeia
- European Pharmacopoeia

Cosmetics & Essential Oil

Products

Perfumes, Tooth Paste, Hygiene products, Cosmetics, Hair Oil

Test Parameters

Candida albicans, Staphylococcus aureus, Escherichia Coli, Pseudomonas Aeruginosa, Yeast and Mould Count, Total Viable count, Yeast and Mould Count.

Test Method

Indian Standard, Indian pharmacopeia & USP

Plot No : 14 & 15, Sadaramangala Industrial Area, Whitefield Road, Bengaluru, Karnataka- 560048

Contact: 080-35000500, 28410165/166/167/172

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Functional Areas for DRUGS & COSMETICS

AYUSH Products

Products

Ayurvedic drugs, Herbal formulations, Homeopathic Drugs, Siddha Drugs, Unani Drugs

Test Parameters

Total aerobic microbial count (MLT), Yeast and Mould Count (MLT), Escherichia coli, Staphylococcus aureus, Salmonella, Pseudomonas aeruginosa.

Test Method

Ayush Pharmacopeia of India

Biocides

Products

Algicides, Antiseptics, Bactericides, Disinfectants, Fungicides, Herbicides, Insecticides, Sanitizers, Sporicides, Viricides, Weedicides

Test Parameters

Redial Walker Co-Efficacy Test, Staphylococcus Efficient Test, Anti-Microbial Efficacy Test, Anti-Fungal Activity Test, Anti-Bacterial, Activity Test

Test Method

Indian Standard, Indian pharmacopeia & USP

Medical Accessories & Surgical products

Products

Blood Bags, Catheter, Condoms, Copper T, Hypodermic Needles, Tubal Rings

Test Parameters

Sterility Test, Bacterial Endotoxin Test (Gel-clot method).

Test Method

ISO, Indian pharmacopeia & USP



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Analytical Science Division (ASD)

Functional Areas for Food & Farm

Beverages

Products

Tea, coffee, chicory

Test Parameters

Free from any off odour, taint, mustiness, living insects, moulds, dead insects, insect fragments, rodent contamination, extraneous matter, added colouring matter, harmful substances, Total Ash, Moisture, Water Soluble Ash, Alkalinity of water soluble ash, Acid-insoluble ash, Water extract, Solubility in boiling water, Solubility in cold water, Alkalinity of soluble ash in ml of 0.1 N hydrochloric acid per gram of material Aqueous extracts, Caffeine (anhydrous), Crude Fibre Iron filling, Melamine, Lead, Copper, Arsenic Tin, Cadmium, Mercury, Methyl mercury Pesticides

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Functional Areas for Food & Farm

Cereals & Cereal Products

Products

Atta/Maida/Fortified maida/Semolina/Besan/Pearl barley/Food grain/ Wheat/Maize/Jowar/Finger millet /Pulses and Pulses without seed coat /Bajra /Pasta products/ Brown rice/Milled rice / Chia seeds /Maize starch /Corn flakes /Custard powder/ Tapioca Sago/Arrowroot/ Palm Sago starch /Malted milk food/Malt based foods Solvent extracted flours /Biscuit Bread and bread type products Any other food grains Formulated supplements for children.

Test Parameters

- Free from abnormal flavor's, odours, living insects, visible mould, filth (impurities of animal origins, including dead insects), added colour, added flavour, rodent hair, excreta, Other edible grains, Damaged grains, Weevilled grains, Total of foreign matter, other edible grains and damaged grains.
- Moisture, Total ash, crude fiber, Total Protein, Ash insoluble in dilute HCl, Gluten, Total Dietary Fiber, Granularity, Urease activity, Uric acid, Alcoholic acidity, Docosahexaenoic Acid (DHA) Arachidonic Acid (ARA), Ratio of ARA:DHA, Energy from added sugar, Vitamin A, Vitamin D, Vitamin E, Vitamin K, Vitamin C, Thiamine, Riboflavin, Niacin, Pyridoxine. Folic acid, Pantothenic acid, Vitamin B12 Choline, Biotin, Chloride, Calcium, Phosphorous, Magnesium, Sodium, Potassium, Iron, Iodine, Copper, Zinc, Manganese, Selenium, Inositol, Taurine, Essential amino acids, Energy, PDCAAS.

Microbiological: Aerobic Plate Count, Coliform Count, Staphylococcus aureus (Coagulase positive), Yeast and Mold Count, Escherichia coli Salmonella sp, Listeria monocytogenes, Bacillus cereus, Sulphatic Reducing Clostridia.

Contaminants: Melamine, Total Aflatoxin, Aflatoxin B1, Ochratoxin A, Deoxynivalenol.

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium Mercury, Methyl mercury, Pesticide residues.



Functional Areas for Food & Farm

Dairy Products & Analogues

Products

Milk/Milk powder, Dairy whitener and whey powder/Cream powder / Flavoured milk / Khoa or mawa/Sweetened condensed milk /Chakka/ Edible acid casein/ Chhana or Paneer /cheese Fermented milk / Evaporated or concentrated milk/ Milk Fat or Butter Oil /Ghee/Table Butter/ Malai / Ice Cream or Kulfi or Chocolate Ice Cream or Softy Ice-Cream/ Milk ice or milk lolly

Test Parameters

Physical: Appearance, Odour, Taste, Adulterants, Preservatives, Neutralizers

Chemical: Moisture, Total solids, Milk Fat, SNF, Milk protein in milk solids-not-fat, Titrable acidity, Insolubility Index, Total ash, Scorched particles, Total Sodium, Urea, Lactose content as anhydrous lactose, pH, Reichert Meissl value, Polenske value, Butyro-refractometer reading, FFA as Oleic Acid, Peroxide Value, Baudouin Test, Presence of β sitosterol, Iodine value, Saponification value, Fatty acid composition, Vitamin A, Vitamin D

Microbiological: Aerobic Plate Count, Coliform Count, Staphylococcus aureus (Coagulase positive), Salmonella sp, Yeast & Mould count, Bacillus cereus, Listeria monocytogenes, Sulphite Reducing Clostridia, Enterobacter sakazakii (Cronobacter sp)

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium, Mercury, Methyl mercury

Contaminants: Aflatoxin M1, Melamine, Pesticide Residues, Antibiotics

Fats, Oils & Fat Emulsions

Products

Coconut Oil /Cotton seed oil/Groundnut oil/olive oil/ Flaxseed or Linseed oil/ Mahua oil/mustard oil/ Til oil/Niger Seed Oil / Soyabean oil /Refined vegetable oil/Almond oil / Sun flower seed oil /Rice bran oil /Cocoabutter/Peanut butter/Table margarine/ Bakery and Industrial Margarine /Bakery shortening / Milk fat spread /Vegetable fat spread /Vanaspati/ Palm oil/Mutton fat /Goat fat/ Lard/Beef fat or suet Poppy seed oil/Safflower seed oil

Test Parameters

Rancidity, Suspended or other foreign matter, Added colour, Added flavouring substances, Mineral oil, Butyro-refractometer reading at 40°C, Refractive Index at 40°C, Saponification value, Iodine value, Polenske Value, Unsaponifiable matter, Acid value, Turbidity, Argemone oil, Peroxide value, Flash Point, Test for hydrocyanic acid, Natural allyl isothiocyanate, Common salt, Melting point Fatty acid, Diacetyl, Total polar compound, Hexane, Oryzanol content, Trans fatty acid.

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium, Mercury, Methyl mercury.

Contaminants: Melamine, Total Aflatoxin, Aflatoxin B1, Pesticides



Functional Areas for Food & Farm

Meat & Meat Products

Products

Meat and Meat products Egg and Egg products Fish and Fish Products

Test Parameters

Water, Proteins, Fats, Carbohydrates, Ash, Formaldehyde, Polychlorinated biphenyls (Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180

Microbiological: Escherichia coli, Staphylococcus aureus (Coagulase +ve), Salmonella, Listeria monocytogenes, Sulphite Reducing Clostridia, Clostridium Botulinum, Campylobacter Spp.

Contaminants: Melamine, Saffrole, Lead, Copper, Arsenic, Tin, Chromium, Cadmium, Mercury, Methyl mercury Pesticides, Antibiotics

Fruit & Vegetable Products

Products

Fresh fruits & vegetables And their products/ Thermally Processed Fruits and vegetables and their products/ Jam, Jelly and marmalades

Test Parameters

Free from rotting, Free from coating of waxes, Free from mineral oil, Free from colours, Brix Minimum fill, Total soluble solid, Acidity as citric acid, Water capacity, Nutritive sweetener, Drained weight, Water capacity, Vitamin C

Microbiological: Aerobic Plate Count, Yeast and Mold Count, Staphylococcus aureus (Coagulase +ve) Salmonella, Listeria monocytogenes E. Coli 0157 and Vero or Shiga toxin producing, E coli, Vibrio cholera

Contaminants: Patulin (as applicable) Total Aflatoxin, Aflatoxin B1, Melamine, Pesticides.

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium, Mercury Methyl, Mercury,



Functional Areas for Food & Farm

Salt, Spices, Condiments & Related Products

Products

Caraway / Cardamom / Chillies and Capsicum / Cinnamon / Cassia / Cloves / Cumin / Fennel / Mace / Mustard / Ajowan / Star anise / Compounded asafoetida / Nutmeg / Whole pepper / Poppy seeds / Saffron / Aniseed / Turmeric / Curry powder / Mixed masala / Fenugreek / Coriander / Edible common salt

Test Parameters

Physical: Free from extraneous flavor, Free from mustiness, Free from mould, Free from living insects, Free from dead insects, Free from insect fragments Free from rodent contamination, Free from added colouring matter, Free from other harmful substances, Extraneous matter, Insect damaged matter.

Chemical: Moisture, Total ash, Ash insoluble in dilute HCl, Volatile oil content, Sodium chloride, Matter soluble in water other than sodium chloride, Matter insoluble in water.

Microbiology: Aerobic Colony Count, Yeast and Mold Count Enterobacteriaceae, Staphylococcus aureus, Salmonella, Sulphite Reducing Clostridia, Bacillus cereus.

Contaminants: Melamine, Total Aflatoxin , Aflatoxin B1, Pesticide Residues

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium, Mercury ,Methyl mercury.

Sweets & Confectionery

Products

- Milk toffee / Hard boiled sugar confectionery / Lozenges / Chewing gum / Bubble gum / Milkchocolate / Milkcovering chocolate / Blended chocolate / Filled chocolate / Composite chocolate / Ice lollies or edible ices / Ice candy
- Sugar, Jaggery, other nutritive sweeteners / Sodium saccharin
- Honey and its by products

Test Parameters

Chemical: Isomaltulose, Ash sulphated (on salt free basis), Ash insoluble (in dilute Hydrochloric acid), Reducing sugars, Sucrose content Cocoa solids, Milk Solids, Calcium oxide ,Conductivity, Purity as $C_7H_4NNaO_3S$, Moisture, Acidity and alkalinity, Benzoate and salicylate, Readily carbonizable substances, Toluene sulfonamides, Specific gravity at 27° C, Fructose to Glucose ratio, Acidity expressed as formic acid, Free Acidity, Hydroxy Methyl Furfural (HMF), Diastase activity, Water insoluble matters

Contaminants: Melamine, Hydrocyanic acid, Aflatoxin B1, Total aflatoxins, Pesticide Residues

Heavy Metals: Lead, Copper, Arsenic, Tin, Cadmium, Mercury, Methyl mercury



Functional Areas for Food & Farm

Water Analysis

SRI Bengaluru offers a comprehensive water testing service for the packaged drinking water manufacturers and food and beverages processing companies. With state-of-the-art facilities and the latest analytical methodologies SRI offers a complete analysis which includes Pesticides residue, Heavy metals, Microbiological detection, Physical tests, Sensory tests, Chemical tests, PAHs, PCBs, THMs, Other miscellaneous tests. Our testing services is specifically made to meet the water testing requirements as per different standards.

Products

- Drinking water as per IS 10500
- Packaged drinking water as per IS 14543
- Packaged natural mineral water as per IS 13428
- Water for food processing industry as per IS 4251
- Water as per FSSAI
- Water as per WHO
- Water as per customer specifications
- Water as per EU regulation
- Raw water (surface / ground)
- Processed / Treated water

Test Parameters

- | | | |
|--------------------------|--------------------------|---|
| ● Colour | ● Free residual chlorine | ● Lead |
| ● Odour | ● Iron | ● Mercury |
| ● pH value | ● Magnesium | ● Molybdenum |
| ● Taste | ● Manganese | ● Nickel |
| ● Turbidity | ● Mineral Oil | ● Pesticides |
| ● Total dissolved solids | ● Nitrate | ● Polychlorinated biphenyl(PCB) |
| ● Aluminium | ● Phenolic compounds | ● Polynuclear aromatic hydrocarbons (PAH) |
| ● Ammonia | ● Selenium | ● Total arsenic |
| ● Anionic detergents | ● Silver | ● Total chromium |
| ● Barium | ● Sulphate | ● Trihalomethanes: |
| ● Boron | ● Sulphide | ● Uranium |
| ● Calcium | ● Total alkalinity | ● Bromate |
| ● Chloramines | ● Total Hardness | ● Total coliform / 100ml |
| ● Chloride | ● Zinc | ● E.coli / 100ml. |
| ● Copper | ● Cadmium | |
| ● Fluoride | ● Cyanide | |



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Functional Areas for MICROBIOLOGY

Food and Agricultural Products

Products

Bakery & Confectionery Products, Beverages (Alcoholic / Non-Alcoholic), Canned & Processed Foods, Cereals, Pulses & Cereal Products, Coffee & Cocoa Products, Edible Colours & Flavours, Edible Oils & Fats, Edible Salts, Eggs & Egg Products, Essential Nutrients Including Vitamins, Food Additives & Preservatives, Fruit & Fruit Products, Gelatin and Other Gums, Herbs, Spices & Condiments, Honey & Honey Products, Infant Foods, Jams, Juices, Sauces & Concentrates, Meat & Meat Products, Milk & Dairy Products, Natural Waxes, Nuts & Nut Products, Oil Seeds & By-Products, Poultry & Poultry Products, Snacks and Instant Mixes, Starch & Starch Products, Sugar & Sugar Products, Tea, Tobacco & Tobacco Products, Vegetables & Vegetable Products, Ready to Cook / Ready to eat / Canteen Food.

Test Parameters

Total Plate Count, Yeast & Mold count, Total Coliform, Bacillus cereus, Escherichia coli, Escherichia coli O157, Staphylococcus aureus, Salmonella spp, Clostridium perfringens, Vibrio cholerae, Vibrio parahaemolyticus, Shigella spp, Enter bactericide, Listeria monocytogenes, Pseudomonas aeruginosa, Sulphatic Reducing Clostridia (SRC), Pathogenic streptococci, Thermophilic Bacteria, Psychrophilic Bacteria, Bacterial Spore Count.

Test Method

Indian Standard, ISO, ASTM & BAM

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Functional Areas for MICROBIOLOGY

Animal Food & Feed

Products

Animal Nutrition Supplements, Aquaculture feed additives, Aquaculture feed ingredients, Cotton seed cake, Fish, Shrimps, Prawn feed, Groundnut meal, Guar Meal, Oil Cake, Pet Foods, Poultry feed additives, Rapeseed Meal

Test Parameters

Total Plate Count, Total Yeast & Mould, Coliform Count, Escherichia coli, Bacillus cereus, Staphylococcus aureus, Salmonella spp, Clostridium perfringens, Clostridium botulinum, Clostridium sporogenes, Clostridium sp, Vibrio cholerae, Vibrio parahaemolyticus, Shigella spp, Enterobacteriaceae, Listeria monocytogenes, Antimicrobial susceptibility test

Test Method

Indian Standard, ISO, ASTM & BAM

Nutraceuticals & Functional Foods

Products

Carotenoids, Dietary Fibres, Flavonoids, Fortified Food, Phytoestrogens, Prebiotics, Probiotics, Soy Proteins

Test Parameters

Total Plate Count, Yeast & Mould count, Total Coliform, Bacillus cereus, Escherichia coli, Escherichia coli O157, Staphylococcus aureus, Salmonella spp. Clostridium perfringens, Vibrio cholerae, Vibrio parahaemolyticus, Shigella spp, Enterobacteriaceae, Listeria monocytogenes, Pseudomonas aeruginosa, Sulphite Reducing Clostridia (SRC)

Test Method

Indian Standard, ISO, ASTM & BAM

Water

Products

Distilled /Demineralized Water, Drinking Water, Ground Water/ Surface Water, Packaged Drinking Water, Packaged Natural Mineral Water, Water for Construction Purpose, Water for industrial purpose, Water for Medicinal Purposes, Water for Processed Food Industry, Water for Swimming Pool and Spas, Water Purifiers

Test Parameters

Aerobic Microbial Count, Fungal Count, Total Bacterial Count, Standard Plate Count, Yeast and mould, Coliform (MF/MPN), Escherichia coli (MF/MPN), Faecal Coliform (MPN), Streptococci, Enterococci, Salmonella, Shigella, Staphylococcus aureus, Faecal streptococci, Vibrio cholerae, Vibrio parahaemolyticus, Sulphite reducing anaerobes, Pseudomonas aeruginosa.

Test Method

Indian Standard, ISO, ASTM & BAM



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Analytical Science Division (ASD)

SRI-B Offers Other Comprehensive Services

Allergen Testing

An allergen is a substance that can cause an allergic reaction. In some people, the immune system recognizes allergens as foreign or dangerous. Food Allergen labelling is an important requirement especially for food exports into highly regulated markets such as US, Europe, Australia, Japan, and Middle East. The labelling primarily identifies the presence of ingredients containing protein derived from milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, or soybeans, which may result in allergies or intolerance.

Vegetable allergens

- Cereals containing gluten
- Peanuts and products thereof
- Nuts (e.g. almonds, hazelnut, walnut, cashews, pecan nuts, Brazil nuts, pistachio nuts, macadamia or Queensland nuts)
- Lupin and products thereof
- Mustard and products thereof
- Celery and products thereof
- Sesame seeds and products thereof
- Soybeans and products thereof

Animal allergens

- Milk and products thereof
- Fish and products thereof
- Eggs and products thereof
- Molluscs and products thereof
- Crustaceans and products thereof

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SRI-B Offers Other Comprehensive Services

Animal Feeds and Pet Foods

Animal feed and pet food market and is subjected to increased demands in terms of quality testing and flavor testing. Pet food testing will be more accurate when certified, accredited labs conduct tests using guaranteed analysis. Pet food safety are based on a model which is given by the Association of American Feed Control Officials (AAFCO).

Nutritional Labelling

Any food product is required to have a full range of nutritional analysis which covers

- Proximate composition – moisture, fat, protein, ash, fiber
- Determination of Carbohydrate – Total Sugar, added sugars & dietary fiber
- Fatty Acid Profiling – saturated and unsaturated fatty acids, trans fats
- Vitamins, minerals and other trace elements
- Cholesterol

Other Chemical tests

- Additives like propylene glycol, BHA, and BHT, and various food dyes
- Allergens Testing
- Antibiotics Residues
- Pesticides Residues
- Heavy metals
- Mycotoxins



SRI-B Offers Other Comprehensive Services

Food Nutritional labelling (Proximate analysis)

There has been increasing global interest in nutrition labelling as a policy tool through which governments can guide consumers to make informed food purchases and healthier eating decisions. Nutrition labelling includes nutrient declarations, which should be mandatory for pre-packaged foods and for defined nutrients; and supplementary nutrition information, which includes front-of-pack labelling. With greater convenience in making healthier food choices, the nutritional labelling testing concept emerged in India and today, it is mandatory that the nutritional information of almost all processed foods should be displayed on food items.

SRI analytical laboratory being a global leader in food testing conducts complete label claim testing for all nutritional parameters.

We offer a wide variety of chemical testing on diverse food products and also for raw materials. We also perform quality control services for finished products.

Parameters

- Moisture, Ash, Protein, fat, carbohydrate, energy
- Other Specific analysis
- Antinutrients
- Amino acids
- Complete proximate testing (including total dietary fibre)
- Lipid and fatty acid analyses by following mainly wet chemistry and GC methodologies
- Specific fatty acid content
- Saturated fat
- Monounsaturated
- Polyunsaturated
- Trans fat
- Omega-3 and Omega-6
- Cholesterol
- Microbiological assays
- Mineral and inorganic analysis
- Allergens
- Contaminants (pesticides, mycotoxins and antibiotics)
- Stability and shelf-life testing
- Vitamins (A, D, E and B complex, C)
- Calcium
- Iron
- Sodium
- Total Dietary Fibre
- Potassium
- Total Sugar and Added Sugar



SRI-B Offers Other Comprehensive Services

Pesticide Residue

Pesticide residue refers to the chemicals that remain on food after they are applied to food crops. The use of pesticides has increased significantly over the past several decades as it increases yield of crops and makes them resistant to disease and pests. Overuse of pesticides leads to accumulation of harmful chemical residues in plant products which work their way through the food chain and become more concentrated as they move from one creature to another. These concentrated residues can have significant health impacts even in small amounts, and warrant the need for development of stringent regulatory standards and its compliance. Each country adopts their own regulations and standards for MRL (maximum residue limits) as the usage of pesticides varies from country to country and so do the level of food additives usage.

Groups of chemical residues analysed at SRI include:

Products

- Fresh fruits and vegetables
- Dried fruits (incl. concentrates, powders etc.)
- Fruit juices and concentrates
- Tea, Coffee, Cacao
- Baby food
- Cereals
- Rice
- Beverages, Wine and spirits
- Fish & Fish products
- Meat & Meat products
- Herbs & Spices
- Oleoresine
- Flavours
- Dairy products
- Fats and Oils
- Tobacco
- Feed
- Drinking-, ground- or surface water
- Candies
- Honey
- Pet food
- Animal feed

Parameters

- Organochlorine pesticides
- Organophosphorous pesticides
- Synthetic pyrethroids
- N-methyl carbamates
- Chlorophenoxy herbicides
- Dinitrophenolic herbicides
- Quats and other herbicides
- Insect repellents
- Fungicides
- Rodenticides
- Fumigants
- Disinfectants
- Triazines
- Pyrimidines
- Triazoles
- Carbamates
- Dicarboximides
- Benzimidazole
- Dithiocarbamates
- Nicotinoids
- Dinitrophenol
- Aliphatic Nitrogen fungicides
- Morpholine
- Natural Product Derivative
- Substituted Thiourea



SRI-B Offers Other Comprehensive Services

Vitamins

Vitamins are a group of substances that are needed for normal cell function, growth, and development. This means that these vitamins are required for the body to work properly.

Vitamins are grouped into two categories:

- Fat-soluble vitamins are stored in the body's liver, fatty tissue, and muscles.
 - The four fat-soluble vitamins are vitamins A, D, E, and K.
 - These vitamins are absorbed more easily by the body in the presence of dietary fat.
- Water-soluble vitamins are not stored in the body.
 - The nine water-soluble vitamins are vitamin C and all the B vitamins.
 - Any leftover or excess amounts leave the body through the urine.
 - They must be consumed regularly to prevent deficiencies.
 - Exception: Vitamin B12 can be stored in the liver for many years.

SRI is capable of testing all vitamins by the latest technology and worldwide acceptable methodologies.

Spectrum for vitamin testing

Fat-soluble vitamins

Vitamin A, Carotene, Vitamin D2/D3, (ergocalciferol/cholecalciferol), Vitamin E, Vitamin K

Water-soluble vitamins

Vitamin B1 (thiamin), Vitamin B2 (riboflavin), Vitamin B6 (pyridoxin & pyridoxamin & pyridoxal), Vitamin B12 (cyanocobalamin), Niacin (nicotinic acid & nicotinamide), Pantothenic acid, Biotin, Folic acid, Vitamin C

Mycotoxin Testing

Shriram Institute for Industrial Research (SRI) offers comprehensive analysis of Mycotoxins are naturally occurring toxins produced by certain moulds (Fungi) and can be found in food. The moulds grow on a variety of different crops and foodstuffs including cereals, nuts, spices, dried fruits, apples and coffee beans, often under warm and humid conditions. Mycotoxins can cause a variety of adverse health effects and pose a serious health threat to both humans and livestock even at low concentrations. The adverse health effects of Mycotoxins range from acute poisoning to long-term effects such as immune deficiency and cancer.

SRI offers a comprehensive risk-oriented Mycotoxins testing portfolio. This includes screening and confirmatory methods for all regulated and a range of additional Mycotoxins. It is complemented by sampling services and homogenise large sample quantities.

Products

Crops (amongst others corn, wheat, rye, barley), Cereals, Bread and cookies, Dried fruits, Nuts, kernels and flours, Herbs and spices, Milk and dairy products, Coffee, cocoa, Beverages (e.g. beer, wine), Baby food, Meat and meat products, Egg and poultry products, Oils and fats, Convenience food, Basmati rice and other varieties, Confectionery, Dietary food, Food additives, Fruits and vegetables, Grains and cereal products, Tea, herbal tea, fruit tea, Pet food and Animal feed

Parameters

Aflatoxins (B1, B2, G1, G2), Aflatoxin M1, Ochratoxin A, B, Deoxynivalenol, Citrinin, Patulin, Fusarium and Ergot alkaloids



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Material Science Division (MSD)

Functional Areas for Building Materials

Building Materials

- **Cement (OPC, PPC, PSC & WPC):** Consistency, Specific Gravity, Setting Time, Soundness, Compressive Strength, Fineness, Transverse Strength, Drying Shrinkage, Chemical Composition, Lime Reactivity And Other Parameters.
- **Ceramic Tiles, Natural Stones, Granite, Marbles, Aggregates, Concrete, Bricks, Gypsum Board, ACP Sheets, Toughened Glass, Cement and Other Products:** Compressive Strength, Dimensions, Water Absorption, Density, Flexural Properties, Transverse Strength, Frost Resistance, Porosity, Thermal Shock, Acid Resistance, Chemical Resistance and Other Parameters.
- **HSD Bars, SS Tubes, MS Angles, Ferrous & Non Ferrous Metals, Painted Panels, Automotive Spares:** Tensile, Compression, Flexural Properties, Lap Shear, Weld Joint Strength, Bend Test, Impact and Other Parameters.
- Specialised Studies Like Tensile, Compression, Flexural Properties & Lap Shear In Both Elevated Temperature up to 250^oc & Submersible Temperature upto -40^oc.
- Corrosion (NSS, ASS & CASS) Studies on Metal Alloys and Coatings (Corrosion penetration rate, corrosion type, etc..).

Water Proofing Compound

- Compressive Strength, Setting Time, Permeability to Water, Compressive Strength.

Performance and durability evaluation for Domestic Pressure Cookers

- Air Pressure, Bursting Pressure, Capacity, Operating Pressure Regulating Device and Other Parameters, Proof Pressure Test, Test For Safety Pressure Relief Device, Test For Removal Of Lid Under Pressure, Workmanship and Finish.

Safety Matches

- Defective, Ignition, Friction, Impact, Load Test, Match Splints, Match Head, Performance, Striking Performance, Thermal Stability, Wearing Strength, Afterglow, Appearance, Classification & Marking, Containers, Contents, Damp Proofness, Ease of Opening, Envelopment, Friction Surface, Ignition below 170^oC, Ignition Resistance, Length of Match Sticks, Retention of Contents and Other Parameters.

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Functional areas for Rubbers, Plastics, Composites, Fiber and Sealents

Physico - Chemical & Mechanical Evaluation & Research Studies On Polymer Products Like Plastic, Rubber, Fiber, Composites, Resins, Flexible & Rigid Foam, Thin Films, Rigid Sheet, Adhesives, Sealants & Other Relevant Products.

Specialised Strength on Evaluation of Root Cause Failure, Method Development, Method Validation, Product Development & Product Validation. Including the Assessment of Environmental Simulation Properties.

Composites

Physico – Chemical & Mechanical properties tests & Research facility on COMPOSITES: Flexural, Tensile, Peel Strength, Shear, Void Content, Drum Peel, Cured Ply Thickness, In Plane Shear Strength, Inter Laminar Shear (ILSS), Flat wise Tensile Strength, Single Lap Shear, Double Lap Shear, FTIR, Tubular Shear & Other Parameters.

Analytical Support

LDPE Films, HDPE Films, Multilayered Cross Laminated Films, UPVC/HDPE/ LDPE Pipes/Casing Pipes, Surgical Rubber Gloves, Tubular Rings, Condoms, Decorative Thermosetting Laminate, Rigid Cellular Foam, PET Bottles, HDPE Water Tanks, Rubber Hose, RPM, PVC Flooring, Epoxy Flooring, Resins, False Ceiling, Water-proofing Membrane, FRP Pipe, Plastic Chairs, flexible packaging materials, honey comb products, Rigid and semi rigid thermo-plastics including filled, reinforced, moulded & extrusion materials, Tarpaulin made from HDPE woven fabric, Thermal insulating materials & Other Products

Functional Areas for Metals & Minerals

- ❖ Chemical composition of Ferrous Alloys by Arc Emission Optical Emission Spectra, Atomic Absorption Spectra, ICP-OES, ICP-MS and Classical Wet analysis.
- ❖ Chemical composition of Copper base Alloys, Brass by Arc Emission Optical Emission Spectra, Atomic Absorption Spectra, ICP-OES, ICP-MS and Classical Wet analysis.
- ❖ Chemical composition of Aluminium Alloys, Brass by Arc Emission Optical Emission Spectra, Atomic Absorption Spectra, ICP-OES, ICP-MS and Classical Wet analysis.
- ❖ Chemical composition of other Alloys like Brass, Bronze. Solder, Nickel Alloys by Atomic Absorption Spectra, ICP-OES, ICP-MS and Classical Wet analysis.
- ❖ Coating analysis by Microscopic and Stripping Method.
- ❖ Microstructure Analysis.

Ores & Minerals

Iron Ores, Manganese Ore, Lime stone, Bauxite Ore, Copper Ore, Precious Metallic Ores, Silicate, Gypsum & Lime stone reactivity.



Functional areas for Paints, Inks and surface coatings

Evaluation of Various paints Formulations for its VOC's and TVOC's as per International Standards. Antifungal, Anti Bacterial Studies, Global Migration Studies, Contamination Studies, Chemical, UV, Xenon Arc, Thermal, Humidity, Cold & Pressure Sustainable Studies, Corrosion Resistance Studies (Neutral Salt Spray, Copper Accelerated Salt Spray, Acidic Acid Salt Spray), Colour, Scratch Hardness, Fineness, Wet Opacity, Colour Fastness, Hardness, Impact, Tape Adhesion, Cataplasm (Wet Poultice Test), Density, Volume Solids, Trigloss, Coating/Dry Film Thickness, Viscosity (Ford Cup), Drying Time, Durability Studies.

Functional Areas For Industrial and Fine Chemicals

Identification, Solubility, Colour (Platinum–Cobalt Scale, Lovibond, LAB Values), Assay (Purity), Metals by Atomic absorption Spectrometry, ICP-OES, ICP-MS, UV Visible Spectrophotometer, Solvents Assay by GC and HPLC, Refractive index, Density, pH, Viscosity, Impurity Analysis by FT-IR, GC and HPLC, Melting Point, Boiling Point, Optical Rotation, Water Content, Electro Plating solutions and Etchants, Electro Plating Chemicals like Gold Potassium Cyanide & Silver Cyanide, Identification and Complete Analysis of Unknown Chemicals

Soaps and Detergents

Complete Physico-Chemical Composition of Soaps, Anionic, Cationic and Non Ionic detergents

Functional Areas For Petroleum & Fuel

Diesel / Bio diesel / Kerosene

Density, Kinematic Viscosity, Flash Point (Abels), Cetane Number(Calculated), Distillation Range, Ramsbottom Carbon Residue, Sulphur, Water Content, Copper Strip Corrosion, Acidity, Ash Content, Sulfated Ash, Methanol, Ethanol, Ester Content, Free Glycerol, Total Glycerol, Sodium and Potassium, Calcium and Magnesium, Iodine Value, Oxidation Stability@ 110°C, Smoke Point in kerosene.

Gasoline / Naptha

Colour, Density @ 15°C, Distillation Percent by Volume, Sulphur total, Lead Content (as Pb), Reid vapour pressure (RVP) , Vapour Lock Index, Benzene Content, Copper Strip Corrosion (for 3 h @50°C), Water Tolerance of Gasoline-Alcohol Blends, Engine Intake System Cleanliness, Olefin Content, Oxidation stability, Aromatic Content, Oxygen Content, Oxygenates, Methanol, Ethanol, Isopropyl Alcohol, Iso-Butyl Alcohol, Tertiary-butyl Alcohol.

Fuel Oil / Furnace oil

Acidity, Gross Calorific Value, Relative Density, Copper Strip Corrosion, Kinematic Viscosity, Flash Point(PMCC), Water Content, Ramsbottom Carbon Residue (RCR), Asphaltenes, Sulphur, Sediments, Ash.



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Lubricants : Hydraulic oil, Engine oil, turbine oil, transformer oil and other mineral oils

Acid Number, Base Number, Flash Point(COC), Pentane Insoluble, Toluene Insoluble, Kinematic Viscosity @ 40 and 100 °C, Viscosity Index, Water Content, Fuel Dilution, Diesel Content in Used Engine oil, Wear Elements(Copper, Iron, Nickel, Zinc, Lead, Chromium, Manganese, Aluminium), Copper Corrosion, Silver Corrosion, Paraffins, Aromatics and Naphthenes, Sulphated Ash/Ash, ASTM Color, Elemental Analysis, Pour Point, Salt Bath Corrosion, Rust Preventive Characteristics, Emulsion Characteristics, Foaming Characteristics, Air Release Value, Oxidation Stability, Breakdown Voltage, Dielectric Strength.

Grease

Consistency, Free Acidity/Alkalinity, Drop Point, Copper Strip Corrosion, Water Content, Wear Metals, Oil Separation/Thermal Stability, Four Ball Test (for wear scar and wear dia), Silica content.

Wax and Bitumen

Density, Viscosity, Bitumen content, Needle Penetration, Softening Point of Bitumen, Melting Point of Wax, Trichloroethylene insolubles, Residue on Sieve, Residue on Evaporation, Particle Charge, Water Content, Distillation, Acidity, Lovibond Color for Wax, Acid Value, Oil Content, Ash Content, Ductility.

Solid fuels (briquettes, Coal & coke)

Proximate Analysis, Ultimate Analysis, Gross Calorific Value, Chemical Analysis of Ash

Functional Areas For Pesticide Formulations

Active Ingredient as per IS and WHO methods, Emulsion Concentrates (Active Ingredient, Emulsion Stability, Cold Test, Flash Point, Acidity), Water Dispersible Powders (Active ingredient, Sieve Analysis, Acidity, Suspensibility), Aluminum Phosphide, Zinc Phosphide for its Purity, Granules.

Functional Areas For Wood & Wood Products

Marine Plywood, Bwr Plywood, Timber Wood, Coir Boards, Block Board, Particle Board.

Dimensions, Density, Moisture Content, Water Absorption, Screw & Nail Withdrawn, Adhesion of Plies, Glue Shear, Modulus of Elasticity (MOE), Modulus of Rupture (MOR), Compression, Load bearing capacity, Tensile, Resistance to dry Heat, Resistance to Water, Static bending Strength, Fire retardant, Water Resistance and Other Parameters.

Functional Areas For Paper & Paper Products

Kraft Paper, Germination Paper, Photocopier Paper, Corrugated Box, Tissue.

Dimensions, Substance, Moisture content, Capillary Rise, Tensile Strength, Tensile Index, Tensile Elongation, Resistance to bending, Brightness, Opacity, Edge Crush Resistance, Flat Crush Resistance, Water penetration, Water Absorption, Bursting Strength, Tear resistance, Box Compression, Dimensions, pH, Ash content, RoHS, Gloss, Opacity, Water Soluble chlorides, Water soluble sulphates, Anti Microbial test, Anti Bacterial test, Anti Fungal test, REACH compliance, Global migration Studies and Other Parameters.

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Special Services

Major potential trust sectors like Automotive, Aerospace, Defense, Railway, Marine, Bio Medical, Domestic & Industrial Packaging Industries through Basic Material Characterization, Failure Analysis, Route cause Evaluation, Method Development & Validation, Product Development & Validation and Environmental Simulation Studies.

Few Prominent & Testing Capabilities

- Validation studies on Bio-medical devices.
- Aerobic biodegradation on packaging materials.
- Involved in services with aerospace, defense and automotive industries.
- Testing services approved from AIRBUS, ALSTOM, TASL & many more
- Specialized studies like Tensile, Compression, flexural properties & lap shear in both elevated temperature up to + 250°C & submersible temperature upto – 40°C.
- Creation of new test facility as per customer needs.
- Evaluation Facility for honey comb products, Composites & Aerospace Materials and Other Parameters.
- Stability Studies of Chemicals.
- Metallographic studies to support surface characteristics Evaluation.