

**List of Pharmaceutical Equipment** used in different Pharma companies Industries.

## **Pharmaceutical Machinery**

The growth in advancement and up-gradation of technology in machinery has lead to manufacture all kinds of Pharmaceutical Machinery in India. As low technology offerings have been faster in the initial stage, the Indian machinery today is considered as one of the value-added engineering's with the integration of new technologies. More than 350 facilities in India's pharmaceutical-machine manufacturing industry are present. The Indian pharmaceutical machinery industry is currently catering to the segments of tableting and capsulation, powder processing, material handling, R&D equipment and instrumentation, coating, bulk drug plant installation etc. The SME sector facilitates around 800 pharmaceutical machine manufacturing and allied utility service units. Majority of these units undertake the supply of custom-made machineries using the location advantage of buyers and job works. There is tremendous scope for the machinery manufacturers to exploit the potential in the country provide by serving necessary machinery for existing 17,000 pharmaceutical companies.



They ensure proper design, ease of user application, simple maintenance and also validation protocol for the new equipment essential for the pharmaceutical companies. The categories varies from pharmaceutical machinery, instrumentation and process control, lab equipment, pharmaceutical research and development (R&D) tools, packaging material and machines, plant design and engineering, pharmaceutical process technology.

## ist of equipments used in Pharmaceutical industry laboratory pdf

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Let's explore the Pharmaceutical Equipment

- ADME-Tox Screening System
- Amino Acid Analysis System / Amino Acid Analysis Instruments
- Automated Hit Picking Systems
- Automated Proteomics Workcell
- Bio molecular Interaction Analysis
- Automated Bio molecular Interaction Analyzer
- Dual Polarization Interferometer
- Quartz Crystal Microbalance (QCM)
- Surface Plasmon Resonance Imaging (SPR Imaging)
- Blood Chemistry Analyzer / Blood Analyzers
- Albumin Analyzers (Albumin Testing)
- Automated Blood Gas Systems
- Automatic Biochemistry Analyzer / Automated Biochemical Analyzer
- Blood Bank Automation System / Automated Blood Bank System
- Blood Gas Analyzers
- Blood Lactate Analyzer / Blood Lactate Testing Equipment
- Chemistry Analyzer / Clinical Chemistry Analyzers
- External Quality Assessment (EQA)
- HbA1c Analyzer / Haemoglobin Analyzer
- Haematology Analyzers
- Haemostasis Analyzer
- Immunoassay Analyzer
- Immunoassay System
- Immunochemistry Analyzer
- Laboratory Blood Glucose Analyzers
- Cell Counters / Colony Counters
- Automated Cell Counter
- Bacterial Colony Counters
- Colony Counting Apparatus
- Cell Disruptor
- Cell Harvesting System
- CO<sub>2</sub> Transmitter / Carbon Dioxide Transmitter
- Colony Picker
- Disintegration Tester / Disintegration Apparatus
- Dissolution Apparatus / Dissolution Tester

- Dissolution Sampler / Dissolution Sampling System
- Dissolved CO<sub>2</sub> Meter / Dissolved Carbon Dioxide Analyzer
- Electrophoresis Analysis
- Capillary Electrophoresis Instrument
- Digital Gel Photography System / Gel Image Capture System
- Electrophoresis Power Supply
- Gel Electrophoresis Instrument
- Off-gel Fractionators/ Off-gel Electrophoresis System
- UV Trans-illuminator
- Flow Cytometry
- Automated Flow Cytometry System
- Flow Cytometer
- Friability Tester / Friability Test Apparatus
- Gas Chromatograph Mass Spectrometer (GC MS Instrument)
- Gas Chromatography Equipment
- Gas Chromatograph / GC System (GC Instruments)
- Gas Chromatograph Mass Spectrometer (GC MS Instrument)
- GC / GC MS Software
- GC Auto-sampler / GC Headspace Auto-sampler
- GC Fraction Collector
- GC Gas Regulators / High Purity Gas Regulator
- Multidimensional Gas Chromatography (MDGC / GCxGC)
- Portable GC MS
- Glass Bead Autoclave
- Glass Bead Sterilization / Laboratory Glass Bead Sterilizer
- Hyper-spectral Image Analysis
- Chemical Imaging Systems (NIR / Raman)
- Hyper-spectral Camera / Hyper-spectral Imaging Systems
- Immuno-blotting Equipment
- Blot Strip Cutter
- Inhalation Exposure System / Aerosol Inhalation Chamber
- Laboratory and Industrial Freezers
- Cryogenic Refrigerator / Cryofreezer
- Cryogenic Shippers / Cryoshipper
- Laboratory Refrigerator Freezer
- Liquid Nitrogen Canister / Liquid Nitrogen Dewar
- Liquid Nitrogen Freezer / LN<sub>2</sub> Freezers
- minus 20 freezer (-20C to -40C Freezers)
- minus 80 Freezer (-86 Freezer)
- Plasma Freezer / Blood Bank Freezer

- Tissue Freezer
- Ultra Low Temperature Freezer (ULT Freezers)
- Laboratory Animal Monitoring
- Animal Pulse Oximeters
- Animal Temperature Probe
- Animal Ventilator
- Animal Warmers
- Blood Pressure Systems / Blood Pressure Monitor
- Capnograph / Capnography Monitor
- Lab Animal Exercise / Walking System
- Laboratory Animal Anaesthesia System
- Physiological Monitor
- Laboratory Freeze Dryer
- Laboratory Hoods
- Cage Changing Hoods
- Cell Processing Work Station
- Forensic Workstation / Forensic Hood
- Glove Boxes
- IVF Workstation
- Laboratory Fume Hoods
- Laminar Flow Hoods / Biological Safety Cabinets
- PCR Workstation / PCR Cabinet
- Reverse Flow Workstations
- Laboratory Incubators
- CO<sub>2</sub> Incubator / Cell Culture Incubator
- Dry Bath Incubator / Dry Block Heater
- Hybridization Incubator
- Hypoxia Incubator / Hyperoxia Incubators
- Hypoxic Chamber
- Incubators and Microbiology Incubators
- Insect Growth Chamber
- Laboratory Bioreactor / Cell Culture Bioreactor (Fermentor)
- Laboratory Test Chambers / Stability Chambers
- Modular Incubation Chamber (Incubator Chamber)
- Plant Incubator / Environmental Growth Chambers
- Radioactivity Containment Incubator
- Refrigerated Incubator
- Refrigerated Incubator Shakers
- Rodent Incubators
- Roller Bottle Incubator / Roller Bottle Apparatus

- Shaking Incubator / Incubator Shakers
- Single Use Bioreactor
- Vortex Mixer (Incubator)
- Water Jacketed Incubator
- Laboratory Pumps
- Continuous Flow Pump
- Hazardous Location Pump
- High Pressure Syringe Pumps
- Laboratory Liquid Aspiration System
- Laboratory Peristaltic Pump
- Laboratory Vacuum Pumps
- Liquid Pumps
- Metering Pumps
- Syringe Infusion Pump / Laboratory Infusion Pump
- Syringe Pump / Programmable Syringe Pump
- Laboratory Spray Dryer
- Laboratory Sterilization Equipment
- Agar sterilizer / Media Sterilizer
- Autoclave Sterilizer / Laboratory Autoclaves
- Cleaning-In-Place (CIP) System / Sterilization-In-Place (SIP) Systems
- Dry Heat Sterilizer / Dry Heat Oven
- Laboratory Steam Sterilizer
- UV Chamber
- Liquid Chromatography Mass Spectrometer (LC MS Instrument)
- Liquid Handling Equipment
- Automated Petri Dish Filler / Agar Plate Pourer
- Automated Pharmaceutical Formulation Systems
- Automated Solid Phase Extraction System (SPE System)
- Automated TLC Spotting System (TLC Spotter)
- Automated Vial Filling Machine
- Laboratory Burette / Bottle-top Burettes
- Laboratory Dispensers / Lab Dispenser
- Laboratory Liquid Aspiration System
- Liquid Handling Robotics (Automated Systems)
- Dispenser / Multichannel Pipetting System (Automated Pipetting)
- Stacker / Handler
- Washer / ELISA Plate Washer
- Pipettes / Micropipettes
- Mass Spectrometers
- Clinical Mass Spectrometry / Clinical Diagnostics Mass Spectrometer

- Electro-spray Ionization Quadrupole Mass Spectrometer
- Inductively Coupled Plasma Mass Spectrometer (ICP MS)
- Maldi TOF Mass Spectrometer (MALDI TOF MS)
- Mass Spectrometers (by Ion Source)
- Mass Spectrometers (by Mass Analyzer)
- Mass Spectrometers (by Systems)
- Proton Transfer Reaction Mass Spectrometer (PTR-MS)
- Thermal Evolved Gas Analyzer / Mass Spectrometer (EGA-MS)
- Mechanical Micro-dissection System / Piezo Power Micro-dissection Systems (PPMD)
- Microarray Technology / Microarray Imaging
- Hybridization Station / Microarray Hybridization
- Microarray Reader / Microarray Scanner
- Micro-encapsulator
- Instrumentation
- Automated Labeler
- Automated Seal Piercer
- Automated Sealer
- Dried Blood Spot (DBS) Processor
- ELISA System / ELISA Workstation
- Fluorescent Plate Reader
- Integrated Multi-Assay Workstation
- Manual Sealer
- Capper
- Centrifuge
- Dispenser / Multichannel Pipetting System (Automated Pipetting)
- Incubator Shaker
- Reader / Micro-titer Plate Reader
- Micro-plate Reader Gas Control Module
- Micro-plate Sealing Film
- Micro-plate Stacker / Micro-plate Handler
- Micro-plate Thawing Station
- Micro-plate Transport System / Automated Micro-plate Mover
- Micro-plate Washer / ELISA Plate Washer
- Micro-plates / Microtiter Plate
- Multimode Micro-plate Reader
- Nephelometer / Micro-plate Nephelometry Reader
- Plate Luminometer / Luminescence Reader
- Tube Luminometer
- Non-Invasive Carbon Dioxide Sensors

- Non-Invasive pH Sensors
- Nucleic Acid Sample Preparation
- DNA Shearing Sonicator
- Next Gen Sequencing Library Construction / Fragment Library System
- Nucleic Acid Purification Instruments
- Organic Synthesizer / Chemical Synthesizer
- Oxygen Measurement / Oxygen Analysis
- Dissolved Oxygen Analyzer / Dissolved Oxygen Monitor
- Non-Invasive Oxygen Sensors
- Oxygen Transmitter
- Portable Dissolved Oxygen Meter
- Shake Flask Monitoring System / Multidisc Monitoring Systems
- Particle Analysis / Particle Characterization
- Automatic Titrator / Auto titration (Autotitrator)
- Chemisorption Analyzer
- Magnetic Analyzer (Metallic Iron Analyzer)
- Particle Analysis / Characterization Accessories
- Particle Counting (Particle Counter)
- Particle Imaging Systems (Particle Shape Analysis)
- Particle Size Measurement / Particle Sizing Systems
- Physisorption Analysis
- Porosimeter
- Surface Energy Analyzer (Inverse Gas Chromatograph)
- Zeta Potential Analyzer
- PCR Technology / PCR Systems
- DNA Thermal Cycler / PCR Instrument
- Gradient PCR Machine
- PCR Workstation / PCR Cabinet
- Real Time PCR Machine (qPCR Machine)
- pH Transmitter
- Physiology and Neurology Equipment
- Brain Slice Chamber
- Electrophysiology Equipment
- Portable Laboratory Equipment / Field Testing Equipment
- Hand Held TDS Meter / Portable TDS Meters
- Leaf Area Meter / Portable Leaf Area Meters
- Portable Balances
- Portable Conductivity Meter (EC Meters)
- Portable Density Meter / Handheld Density Meter
- Portable Dissolved Oxygen Meter



- Portable Fume Extractor / Laboratory Fume Extractors
- Portable Fume Hood
- Portable GC MS
- Portable pH Meter / Hand Held pH Meter
- Portable Photosynthesis System
- Portable Raman Spectrometer
- Portable Refractometer / Handheld Refractometers
- Portable Spectrometer / Handheld Spectrometer
- Portable TOC Analyzer
- Portable Turbidity Meter (Portable Turbidimeter)
- Portable Viscometer
- Portable XRF Analyzer / Handheld XRF Analyzer
- Soil Respiration / Soil CO<sub>2</sub> Flux Systems
- Powder Analysis (Powder Analyzer)
- Powder Flow Tester / Powder Flow Analyzer
- Powder Handling Equipment / Powder Dispensing Equipment
- Automated Pharmaceutical Formulation Systems
- Automated Powder Handling Systems
- Laboratory Powder Dispenser / Benchtop Powder Dispensers
- Powder Dispensing System / Semi-Automated Powder Dispensing Systems
- Powder Flow Tester / Powder Flow Analyzer
- Powder Pipette
- Process Analyzer / Process Analysis
- At-Line NIR Analyzer
- Chromatography Process Analyzers
- In Situ Raman Spectrometer
- NIR Analysis Software
- Online NIR Analyzers / Inline NIR Analyzer
- Proton Transfer Reaction Mass Spectrometer (PTR-MS)
- Refractometer / Brix Refractometers
- Abbe Refractometer
- Automatic Refractometer
- Clinical Refractometer
- Digital Refractometers
- Portable Refractometer / Handheld Refractometers
- TPN Refractometer / Total Parenteral Nutrition Refractometers
- Rheometers / Viscometers
- Capillary Rheometer
- Cone and Plate Rheometer (Cone Plate Rheometers)

- Cone and Plate Viscometer (Cone Plate Viscometers)
- Controlled Stress Rheometer
- Dynamic Shear Rheometer
- Falling Ball Viscometer / Falling Sphere Viscometers
- Krebs Viscometer
- Portable Viscometer
- Rotational Rheometer
- Rotational Viscometer / Rotary Viscometers
- Viscometer / Digital Viscometer
- Viscometer / Rheometer Accessories
- Shake Flask Monitoring System / Multidish Monitoring Systems
- Solid Phase Extraction Equipment (SPE Equipment)
- Automated Solid Phase Extraction System (SPE System)
- Extraction System Controller
- Solvent Recovery System / Bench Top Solvent Recovery Systems
- SPE Cartridge / Solid Phase Extraction Cartridges
- SPE HPLC Systems
- SPE Manifold
- SPME (Solid Phase Micro-extraction) Syringe
- Vacuum Evaporator / Vortex Evaporator
- Transfection Technology
- Micro-porator / Microporation
- Ultrasonic Homogenizer / Laboratory Homogenizers (Sonicator)
- Veterinary Test Kits / Veterinary Diagnostic Kits

## **Present Scenario of Instruments used in Pharmaceutical industry**

Indian pharmaceutical-machine makers and their Western counterparts increasingly are exploring collaborations and partnerships with each other to innovate or share new technology. Together, they are targeting more price conscious products in developing countries. The number of joint ventures between foreign and Indian machinery manufacturers is a testimony of the Indian machinery industry that can produce international quality at affordable prices by understanding the stringent need of pharmaceutical industry. It is significant to note that compared to the US and Europe, India and China are making machinery which is 10-20 times less expensive. However, German made machines are unbeatable in quality, though the

prices are undoubtedly more than India and it is difficult for Indian manufacturers to produce such quality machines presently.

In future, we can estimate the pharmaceutical companies waging an all-out war to gain a competitive leverage by slashing their production costs to increase their bottom line with little or no time to efficiently plan and design their manufacturing processes. This would set the machinery industry to make in-roads in the various markets of the world leading a manufacturing revolution just like the IT industry.