

# Prototyping Equipment

## Fitzmill



This comminuting machine allows one to resize the particles of solid dose products such as tablets and powders. Particle size directly affects many characteristics of a finished product. These characteristics include color, flowability, blend uniformity, density, reconstitution rates, chemical reactions, and taste.

## Commercial Convection Oven



The Convection Oven allows one to dehydrate or bake in-process materials with controlled uniform heat through out the oven.

## Label Printer



An electrophotographic printer that generates high quality labels in various sizes with outstanding color.

## V-Blender



V-Blender is a self-contained V-shaped tumble blender intended for blending of powders. As the V-shaped shell rotates, the tumbling action brings about homogeneous mixing of the ingredients. An intensifier bar helps achieve homogeneous mixing of small dose ingredients.

## Supply Room



Raw materials are stored here.

## Table Top Tablet Press



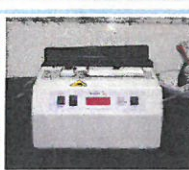
This tablet press is GMP (Good Manufacturing Practices) accepted and is a fully automated machine designed to press tablets from a variety of materials. The tablets can be round (maximum diameter of 1") or irregular shaped (maximum diameter 1.125").

## Friabilator



A device used to test the durability of tablets. Friabilators are accepted throughout the industry as a standard to determine the resistance of tablets to distress encountered in manufacturing, packing and shipping operations. The friabilator has a drum which is constructed for testing the rolling and impact durability of tablets. Indications of wear and tear or fractures of the tablet(s) implies that such tablets cannot endure the rigors of manufacturing and/or shipping.

## Tablet Hardness Tester



The hardness tester tests to guarantee that tablets are not too soft (can disintegrate during transport) and not too hard (which could damage teeth). This hardness tester measures the hardness, the compressive strength of the tablet, to ensure that the tablets' hardness is acceptable. The standard method to test hardness is compression testing. This is when the machine measures the force, in kilopond units (kp), it takes to crush the tablet between two jaws.

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## Planetary Mixer



This machine operates in a planetary motion which ensures uniform mixing. It is used to manufacture granulations and powder blends.

## Skin Care Mini Reactor



The skin care mini reactor system is designed for manufacturing creams, lotions and all types of emulsions. The mini reactor is connected to a PC so that it is easily controlled and values for speed, temperature, torque, pH, etc. are measured and recorded automatically. It optimizes and simulates the mixing, dispersion, and homogenization processes to ensure successful development and commercialization of products.

## Emulsifier



An emulsifier is a big mixer for emulsions. An emulsion is mixture of two liquids that would not normally mix or a mixture of two immiscible liquids. By definition, an emulsion contains tiny particles of one liquid suspended in another. Chemically, they are colloids where both phases are liquids. They are typically milky in appearance and the suspended material may be colloidal in nature. Stable emulsions can be formed from two immiscible liquids when an emulsifier is used. Such emulsions do not separate out after a change in conditions like temperature or over time.

## Extrusion Machine



Allows one to reshape in-process materials with force through a die cavity. The final shape is dependent on the shape of the die installed.

## Encapsulator




This bench top encapsulator is ideal for small trials or prototype batches. When the capsules are in place, the mix is encased in the capsules.



# Quality Assurance (QA) Equipment

**HPLC-SEC**




(High Performance Liquid Chromatograph- Size Exclusion Chromatograph) used to determine the size distribution of macromolecular compounds such as polysaccharides and proteins.

**Accelerated Solvent Extraction ASE<sup>®</sup>**




An automated solvent extraction system for solids or semisolids used to prepare samples for chromatographic analysis. It uses liquid solvents, solvent mixtures, and elevated temperatures (40–200 °C) and pressure (1500 psi) to increase extraction efficiencies.

**HPLC-IC**




(High Performance Liquid Chromatograph - Ion Chromatograph) can accurately determine complex biomolecules, such as carbohydrates, antioxidants, and other nutritional compounds.

**Autoclave**



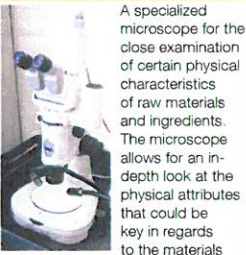
Uses pressurized steam to sterilize equipment and other objects, such as beakers, flasks, spatulas, etc. After sterilization bacteria, viruses, fungi, and spores are inactivated.

**Particle size analyzer**




Utilizes a patented tri-laser technology which provides accurate, reliable and repeatable particle size information. This system measures the size(s) of a powder, granular material, or particles dispersed in fluid.

**Stereoscope Microscope**



A specialized microscope for the close examination of certain physical characteristics of raw materials and ingredients. The microscope allows for an in-depth look at the physical attributes that could be key in regards to the materials function within a formulation. It is also capable of photographing these important characteristics.

**Moisture Analyzer**




An instrument to measure the moisture content of an ingredient or product by means of LOD (loss on drying). By applying heat above 100°C for a period of time unbound water is removed. This is useful for checking consistency and quality of materials.

**Disintegration system**



This machine allows one to analyze the disintegration time of capsules or tablets. It's design and testing methods are USP compliant.

**Dissolution Test Station**




The dissolution test station allows one to observe the process of dissolving a substance into a liquid. Dissolution is best defined as the process where a solid substance enters a solvent to yield a solution.

**-80°C Freezer**




-80°C freezer for biological sample storage.

**Freeze Dryer**



A freeze dryer aids in the process of lyophilization. This is the dehydration process typically used to preserve a perishable material or make the material more convenient for transport. Freeze drying works by freezing the material solid and then providing a vacuum to allow water to sublime directly to gas.

**Bioreactor**



An apparatus (vessel) that allows for fermentation in which living organisms and especially bacteria synthesize useful substances to determine the effects certain ingredients, and/or products, have in a similar environment to the human digestive system. The binary pumps allow different pH levels to help mimic conditions in the GI system.