LAST®
TECHNOLOGY

PHARMA DIVISION

cGMP Process equipment

TRAY DRYER TD

cGMP Dryers For The Pharmaceutical Industry

MAIN APPLICATIONS

LAST Technology designs, manufactures, tests and deliveries high grade static drying oven (named “TD”) dedicated to a wide range of products within the pharmaceutical, chemical, biotechnology, cosmetics and food industries.

Products such as powders, fine granulates, crystalline materials, medicinal plant extracts, food additives and filters are thermosensitive and do not sustain high processing temperatures.

TD process is a gently static hot air drying of products containing water or solvents without modifying their characteristics.

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KEY CONCEPTS OF AIR DRYING

Product drying occurs through its exposure to filtered hot air during a preset time.

The machine size and time of exposure depends on the quantity and density of the product to be dried.

A humidity probe can be applied in the chamber to control the residual humidity during the process while clamp connections are present on the chamber walls for validation procedures.

Air heating medias are: electricity, hot water or steam.

At the end of the process the chamber is cooled down by an heat exchanger functioning with cold water.

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DESIGN AND CONSTRUCTION FEATURES

- Orbital piping welding
- Square or rectangular cross section chambers made of 316L SS
- Piping and aeraulic system completely made in 316L SS with in-line sanitary fittings (tri-clamp ferrules and hygienic flanges)
- Product contact surfaces mechanically polished below to 0.35 um
- Chamber and trays with rounded edges and smooth corners
- Areas separation by means of bio-seal frame made of 304 or 316L SS
- Components and instruments made of 316L or 316Ti SS and FDA approved
- Chamber and doors sealing guaranteed by a double-lips gaskets

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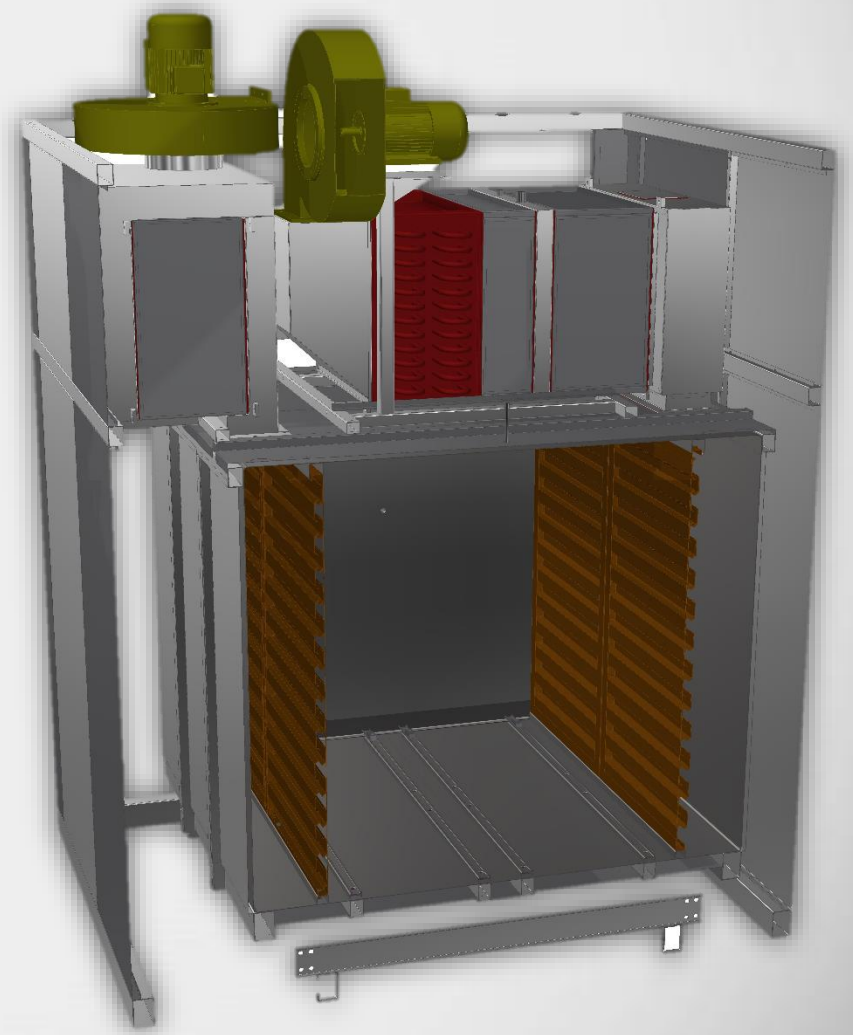
- Chamber, doors, piping, components and instruments are properly insulated with a high grade thermal insulation material
- Ramped heating by means of electrical elements made of Alloy Incoloy 850 or by steam heater in case of ATEX version
- Ramped cooling by means of heat exchangers made of 316L SS running with cooling water
- Process temperature deviation below ± 2 °C
- Air intake and extraction flows controlled by an A/C driver
- Air deflectors to guarantee an homogeneous air distribution
- Built-in air handling units (air intake and air exhaust with HEPA 14 filters)
- Built-in air recycling wall with HEPA 14 filters
- Built-in or stand alone electrical cabinet



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MAIN OPERATING PARAMETERS

- The drying temperature is adjustable between **40 and 120°C** with a temperature deviation of ±2°C inside the chamber
- Residual moisture: 0,03%
- Product cooling up to room temperature below 25°C
- The loading capacity of each size/equipment/chamber is calculated in accordance to a product absolute weight of 0.5-0,6 gr/cm3 and a thickness inside the trays of 35mm

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ATEX CONSTRUCTION

For applications using products containing a high percentage of alcohol or solvent generating vapors, classified as inflammable and potentially explosive, LAST TECHNOLOGY recommend the ex-proof construction that incorporates design features and special system of protection in accordance to the ATEX Directive (CE Ex II 2/3G).

LAST TECHNOLOGY Tray Dryers are designed, manufactured and tested in accordance to the most updated ISO standards, FDA guidelines, GAMP 5 procedures and cGMP requirements.

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BENEFITS

- Ergonomic handling
- Simple cleaning
- User friendly design
- No cross-contamination
- No product loss
- State of the art components produced by the world's most well-known brands to ensure maximum performance and local availability of spare parts
- TD is a static oven that contains air blower that actively forces H14 filtered hot air throughout all areas of the chamber. The horizontal air flow created by the blower and the deflectors ensures uniform temperature distribution and heat penetration

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SUPERVISORY, TRACEABILITY AND CONTROL SYSTEMS

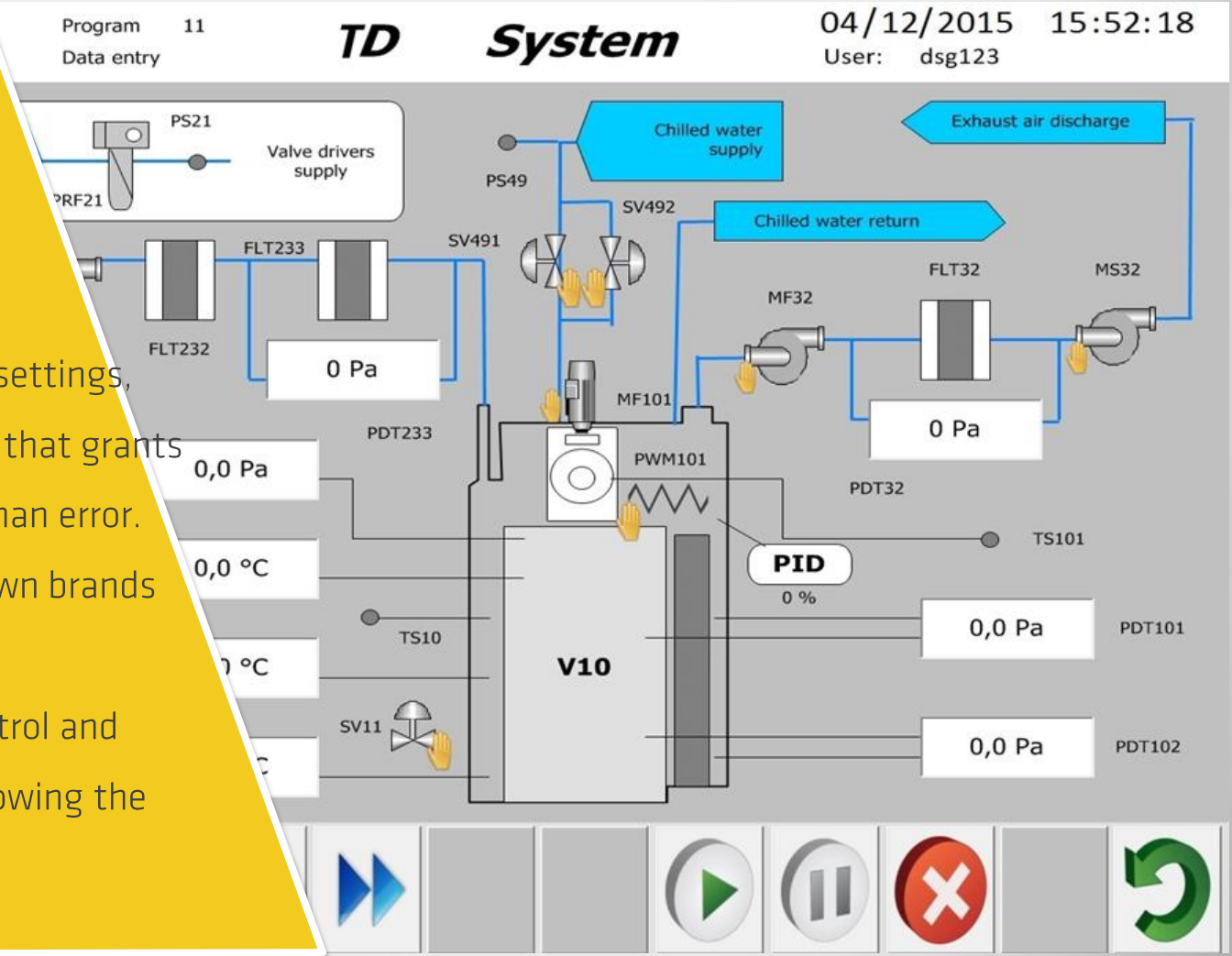
All process equipment engineered by LAST Technology are automated through a Programmable Logic Controllers (PLC).

A color touch screen Panel PC (IPC) performs as Human Machine Interface (HMI).

A P&ID control interface manage all process parameters, recipes, settings, sequence of operations and their storage with an intuitive design that grants an easily accessing to the information, minimizing the risk of human error.

Hardware and software are provided only from the most well known brands such as Siemens, Allen Bradley, ASEM, Wonderware, Rockwell.

In compliance to the 21 CFR Part 11 LAST install a Supervisory Control and Data Acquisition (SCADA) system, developed and engineered following the Good Automated Manufacturing Practices (GAMP 5).



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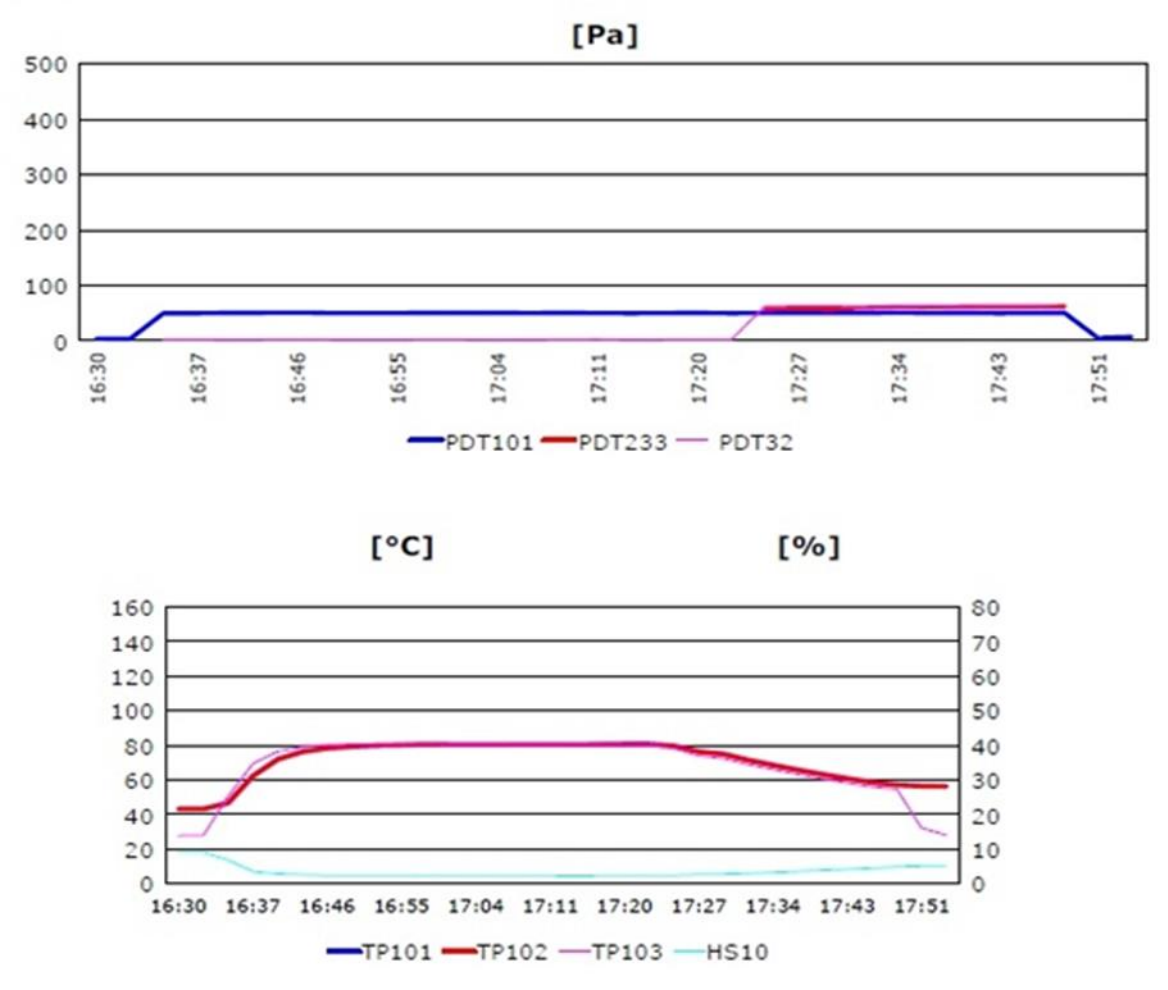

All process parameters and recipes can be customized according to specific requirements.

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THE STANDARD RANGE

Type	Chamber Dimensions (mm - inches)			Capacity (litres / cu. ft.)	Overall dimensions (mm - inches)		
	Width	Height	Lenght		Width	Height	Lenght
TD 300	650 / 25.5	730 / 32.5	715 / 28	300 / 10.5	1710 / 67	2000 / 79	1135 / 44.5
TD 600	650 / 25.5	730 / 32.5	1345 / 53	600 / 21	1710 / 67	2000 / 79	1765 / 70
TD 1000	1050 / 41	730 / 32.5	1345 / 53	1000 / 35	2110 / 83	2000 / 79	1765 / 70
TD 1500	1050 / 41	1075 / 42	1345 / 53	1500 / 53	2230 / 88	2405 / 94.5	1765 / 70
TD 2000	1050 / 41	1375 / 54	1345 / 53	2000 / 70.5	2230 / 88	2705 / 106.5	1765 / 70
TD 2500	1050 / 41	1375 / 54	1675 / 66	2500 / 88	2310 / 91	2495 / 98	2095 / 82.5
TD 3000	1050 / 41	1375 / 54	1975 / 78	3000 / 106	2310 / 91	2495 / 98	2395 / 94
TD 3500	1050 / 41	1720 / 68	1975 / 78	3500 / 123.5	2310 / 91	2840 / 112	2395 / 94
TD 4000	1200 / 47	1720 / 68	1975 / 78	4000 / 141	2460 / 97	2840 / 112	2395 / 94

Chambers and overall dimensions can be customized according to room layout and loading configuration

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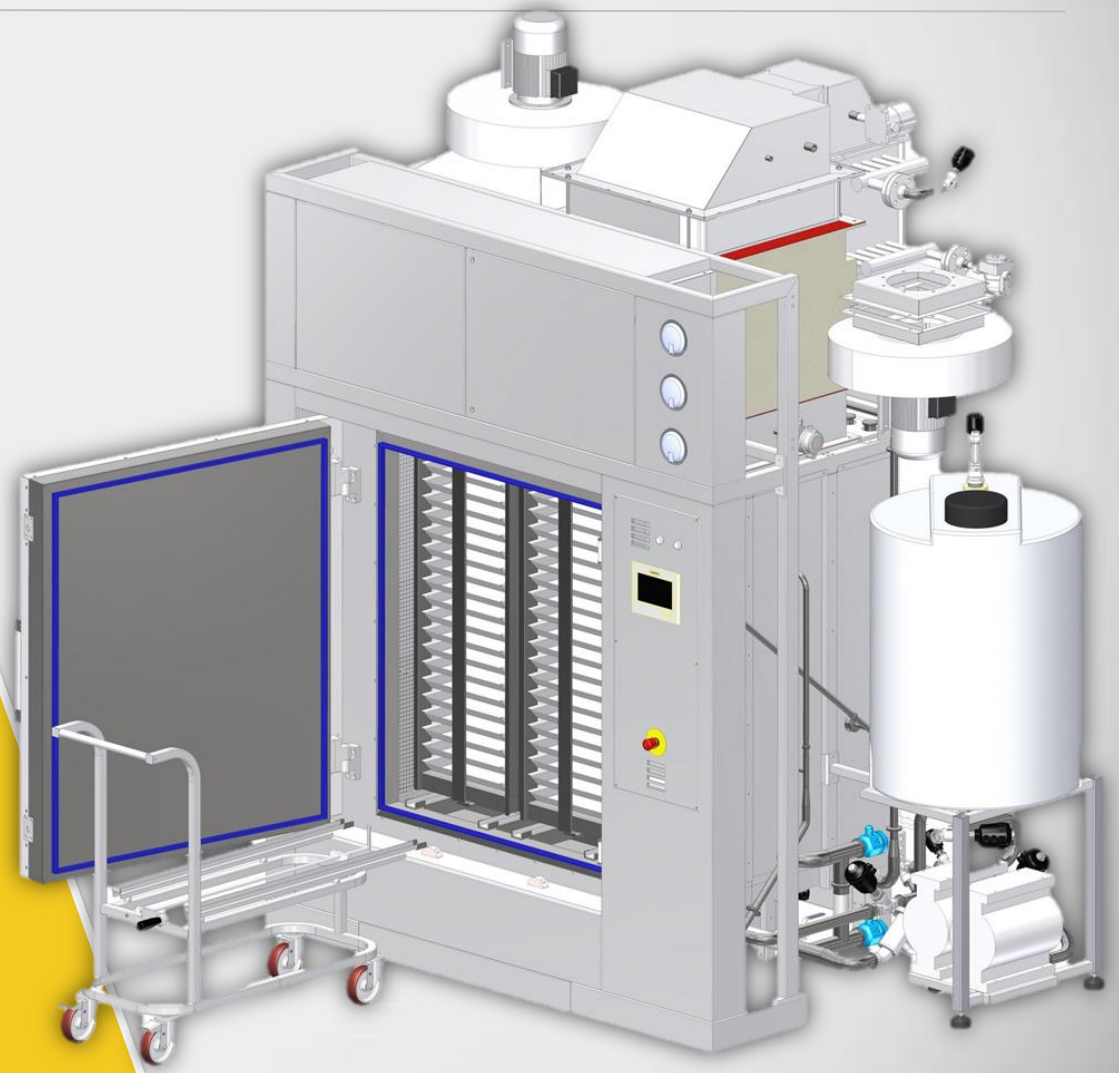
CUSTOM OPTIONS AND ACCESSORIES

- Customizable chamber and overall dimensions
- Combo construction: hot air drying + built-in chamber internal CIP
- Dedicated recipes for specific products
- ATEX construction
- Gas monitor
- Manual hinged or automatic sliding type doors
- Floor standing configuration
- Pit mounted design for direct floor level load
- Automatic loading and unloading system
- Bio-seal flange for ducting to a VHP isolators in case of API
- Wide range of high quality OEM components
- Extensive project documentation for FDA approval



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