



用于制药产品密封件的清洗、硅化、灭菌、干燥设备  
Washing, siliconizing, sterilizing and drying machine for pharmaceutical industry

型号: LST系列 LST series

外形尺寸(mm) Outer Dimension			篮框数 Basket NO.	有效容量 Useful Volume	料斗总容量 Total Volume	注射用水耗量 WFI Water Consumption	洁净蒸汽耗量 Saturated Steam Consumption	软化冷却水耗量 Cold Softened water Consumption	工业蒸汽耗量 Industrial Steam Consumption	压缩空气耗量 Instrument Compressed air Consumption	电源 Power		重量 Weight	
宽度 Width	深度 Depth	高度 Height	Set	Lt	Lt	Kg/cycle	Kg/cycle	Kg/cycle	Kg/cycle	N Lt	控制电源 Control Power AC220V/50HZ/KW	动力电源 Main Power 3-AC380V/50HZ/KW	Kg	
LST80	2800	1330	2600	8	80	240	1000	30	250	40	180	1	31	2370
LST120	3000	1550	2600	12	120	360	1200	60	300	70	180	1	35	3000
LST180	3200	1700	2800	18	180	540	1500	120	350	100	180	1	38	4000
LST240	3400	1930	3000	20	240	720	2000	200	400	120	180	1	43	4800

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LT80	2600	1330	2600	8	80	240	1000	40	180	1	31	2370
LT120	2600	1550	2600	12	120	360	1200	70	180	1	35	3000
LT180	2800	1700	2800	18	180	540	1500	100	180	1	38	3700
LT240	3000	1930	3000	20	240	720	2000	120	180	1	43	4300



Rubber Stopper Washer

胶塞清洗设备



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# 胶塞处理设备 Application 应用范围

设备适用于全面处理制药产品密封的部件，如：橡胶和塑料胶塞、滴管、金属环等类似部件而专门设计的。

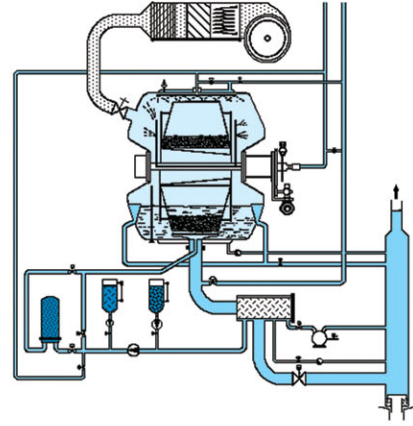
Equipment is designed for fully treatment of sealing devices for pharmaceutical products, like rubber and plastic stoppers, droppers, metal rings and similar components.

## 最突出的优点 Excellent High Lights:

独特的分篮设计结构:胶塞通过物理作用，分配到一定容量的各个单独的篮筐。

Unique Separated I Basket Design: Products are distributed into each separated basket by physical effect.

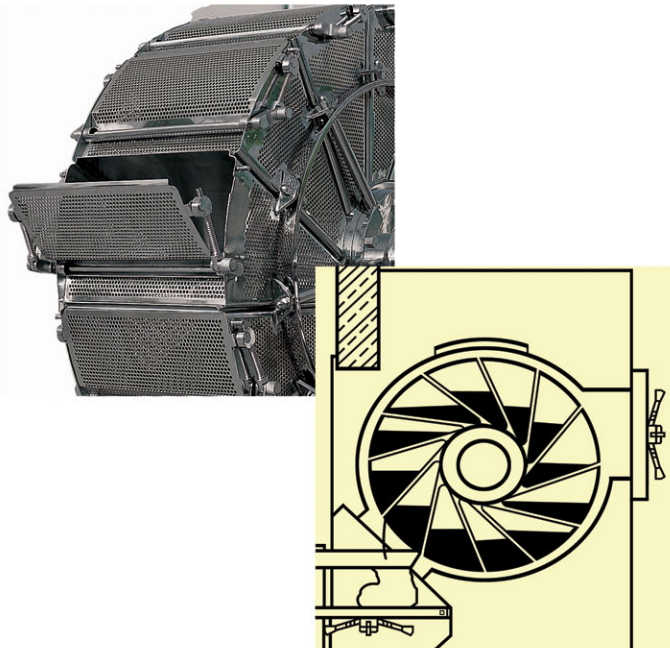
- 最大限度地减少摩擦，表现在：
  - \* 避免胶塞在各个处理过程中形成过大的堆积。
  - \* 减少胶塞所受的机械冲击。
- 最大限度地节水，降低生产成本。
- 胶塞硅化更均匀：带有专门的硅油计量泵加注系统。
- 胶塞灭菌更彻底：对所有胶塞的表面都可以进行灭菌。
- 干燥更充分：采用热风干燥，避免了真空干燥再次污染的可能性。
- 实现分篮卸料，避免交叉污染。
- 分篮卸料时，被处理胶塞有洁净层流气体保护
- 可分装不同种类的胶塞，方便多品种、小配方生产
- 所有水处理部分及胶塞接触的金属部件都是316L不锈钢材质，完全符合FDA的要求。
- Better drying: adopt hot air drying method; avoid re-contamination possibility by vacuum drying method.
- Separated basket discharging, avoid cross-contamination.
- Treated products are protected with LF air while discharging products.
- Different type products can be filled at separated basket; machine is good for various products, and small batch production.
- All the water treating parts and material contact parts are made of SS 316L, completely conform to FDA standards.



- Maximum reduction of friction:
  - \* Avoid over volume stack of products at each process.
  - \* Decrease mechanical strike of products.
- Maximum water saving, to reduce production cost.
- More even siliconizing: with special silicone oil measuring pump and filling system.
- Better sterilization: surfaces of all the rubber stopper products can be sterilized.

## 主要特点 Main Features

待处理产品分装于各自独立的篮筐里，以取得更好的最终处理效果。清洗通过整体篮筐(由独立的篮筐统一固定在空心主轴装上)的旋转来完成，流化床的作用通过循环泵和喷嘴来得以保证可除去悬浮颗粒。



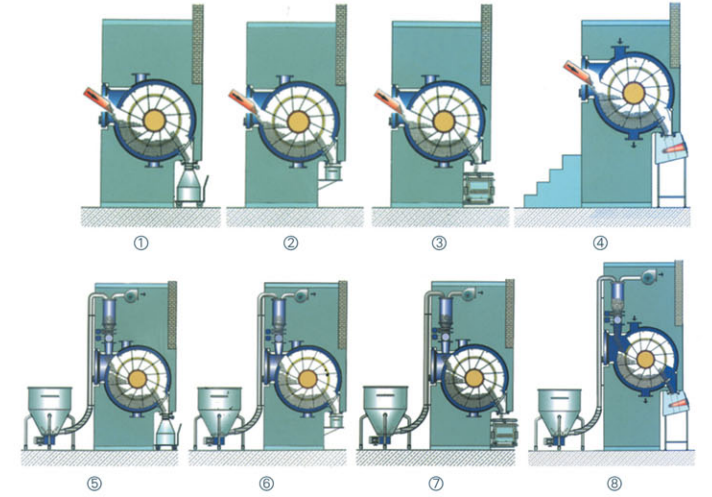
- 在121°C下消毒灭菌
- 干燥由经过HEPA过滤的130°C热空气完成(温度触摸屏上可设定)
- 采用20°C经过HEPA过滤的消毒空气进行冷却
- 装料门、卸料门具有可靠的安全连锁装置
- 可自动开关篮筐门
- 工艺门的制造符合灭菌环境的要求
- 可自动装料
- 可将卸料门与隔离器连接
- 多种选择的自动卸料方式
- 设备装有用于验证实验的连接系统

Products filled at each separated basket, so to achieve better treatment effect. Washing is realized by whole basket drum rotating (each individual basket is fixed on the hollow main shaft), the fluid bed effect is realized by circulation pump and spray nozzle so to eliminate the suspending particles.

- Sterilizing under temperature of 121°C
- Drying with 130°C hot air passed HEPA filters. (temperature can be set at HMI)
- Cooling by 20°C sterilized air passed HEPA filters.
- Loading and unloading door has reliable safety inter-lock devise.
- Basket door open and close automatically
- Process door conform to sterilizing requirements.
- Automatic loading.
- Unloading door connect with isolator.
- Multiple ways for automatic unloading
- Equipment has connections for validation tests

## 结构特点 Structure Characters

- 设备由腔体、若干蓝筐、空心主轴、装料门、卸料门、自动开关篮筐装置、循环泵系统、清洗剂计量添注系统、硅油计量添注系统、热风干燥系统、管道系统、电控系统等组成。
- 腔体、蓝筐、空心主轴、装料门、卸料门、自动开关篮筐装置、管道等跟产品接触部位均采用AISI316L不锈钢制造。
- 腔体内腔全部为圆角结构
- 腔体采用TIG焊接形式
- 腔体内所有部件、管道内表面抛光处理，粗糙度不大于0.5u
- 腔体外表面采用陶瓷绝缘，外部表面为不锈钢板结构；这种特殊结构排除了热量传播的可能性
- 卸料门带有与消毒区相连接的系统。
- 设备外表面最高温度为40°C
- 可自动装料
- 多种选择的自动卸料方式



- Machine is consisted of chamber, baskets, hollow main shaft, loading and unloading door, baskets auto open and close devise, circulation pump system, detergent measuring and filling system, silicone oil measuring and filling system, hot air drying system, pipes system, and electrical controlling system.
- The parts contacting with material such as chamber, basket, hollow main shaft, loading/unloading door, baskets auto open and close devise, pipes, etc are made of SS AISI316L.
- The inner chamber is round angle structure.
- Inner chamber is adopted with TIG welding.
- All the parts, inner surface of pipes inside chamber are polished, with roughness less than 0.5u.
- The outer surface of chamber is adopted ceramic for insulation. The outside surface is SS plate structure, the special design avoid the possibility of heat transfer.
- Unloading door has connections with sterile area
- Maximum temperature of equipment outer surface is 40°C
- Automatic loading
- Multiple ways for automatic unloading

## 控制系统 Controlling System

“LT”和“LST”系列均安装有完整的控制系统，包括触摸屏、可编程控制器、记录仪及打印机。控制系统用于控制设备及主要工艺参数，如F0值，压力及水位控制等，具有简单的人机操作界面，可自定义循环工序并可进行手工操作。

程序设计可满足GAMP5规范要求，可符合FDA 21 CFR part 11电子签名和电子记录要求。

此外，该系统提供一套完整的工序文件可协助操作者实现正确操作。

Series “LT” and “LST” equipped with complete controlling system, including touchable screen, PLC, recorder and printer. The controlling system is for controls of equipment and processing parameters, such as F0 value, pressure and water level, etc, it has simple HMI, and can define circulation process sequences, and can be operated by hand.

Program design conform to GAMP5, and FDA 21 CFR part 11 requirements.

In addition, one set of complete processing document is provided for assisting operator realizes proper operations.



## 工艺过程 Process Phases

- 清洗与漂洗  
含：喷淋；溢流；排放；流化浴；CIP自动清洗五个阶段
- 硅化
- 灭菌
- 干燥、冷却  
清洗、漂洗次数及各工艺阶段的时间，可根据产品的最适当处理周期进行调节。整个工艺设计提供了最大限度的工艺灵活性。

- Washing and rinsing  
Including: 5 phases of spray, overflow, drain, fluid bath and CIP auto washing
- Siliconizing
- Sterilizing
- Drying, cooling  
Time of washing, rinsing and each process can be adjusted according to the appropriate treating cycle of the products. The entire process is designed with maximum flexibility.