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PP 大输液塑瓶/袋生产线解决方案
PP LARGE VOLUME PARENTERAL PRODUCTION LINE



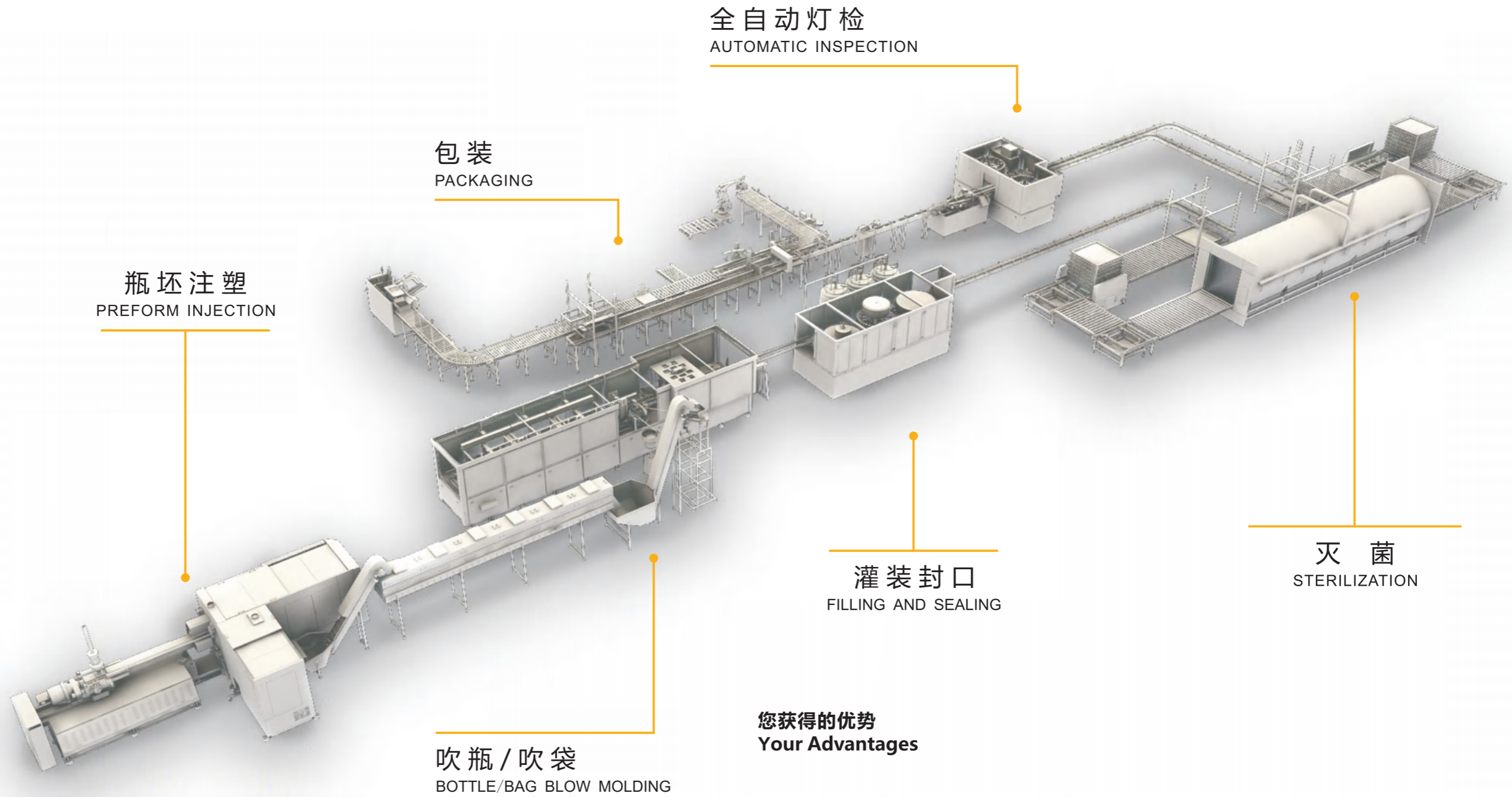
企业介绍 COMPANY INTRODUCTION



德玛克（长兴）自动化系统有限公司为德玛克控股集团全资子公司，生产制造包含高速注塑机及模具，高速吹瓶机，高速智能灯检机，后道包装自动化系统在内的各类产品。其主要从事工业自动化生产设备的咨询、规划、设计、制作、安装、服务等工作，以工厂无人化作为技术目标，结合高性能的机器人技术和专业的传感控制技术以及云数据为手段，完成从原材料入库到成品出库生产过程的无人化工厂解决方案。作为自动化系统应用制造商，德玛克自动化系统整合ABB、FANUC、KUKA等当今世界先进机器人公司的产品对医药包装、汽车零部件、食品饮料、塑料包装等诸多领域提供完善的自动化应用设计和制造。在掌握各行业的前言自动化技术的基础上，对客户行业工艺特性和行业技术进行研究，努力使自身成为行业应用专家，从而提炼和开发出一系列针对行业的专业化解决方案。

Demark(Changxing) Automation System Co., Ltd., one of wholly-owned subsidiaries of Demark Holding Group, manufactures high-speed injection molding machines, molds, high-speed linear & rotary blowing machines, high-speed automatic inspection machines, automated end-of-line packaging system, etc. It is mainly engaged in the business of consulting, planning, designing, production, installation and service of industrial automated manufacturing equipment. It is well ready to provide customers with an unmanned-factory solution covering all the processes form raw-material warehousing to delivery of finished products, thanks to its ultimate technical goal to help set up a fully automated factory, and its good integration of technologies for high-performance robots, for advanced sensors and controls, as well as for cloud data.

As a manufacturer for application of an automation system, Demark(Changxing) Automation System Co., Ltd., incorporates state-of-the-art products from existing world-famous robotics companies, such as ABB, FANUC and KUKA into its automation system, to provide perfect automation-application-related design and manufacture of equipment utilized for such industries as pharmaceutical packaging, automobile parts, food and beverage, plastic packaging. On its road to become one of the top automation-application experts, it has already refined and developed a series of perfect and professional solutions applied to such field, based on its good command of cutting-edge automation technologies used for various industries, and also on its deep research into the characteristics and details of processes and technologies applied by specific customers and the industry itself.



从原料到成品仓储的一站式建厂体验 One Stop Solution For Building Factories From Material To Finished Products

德玛克专为您，带来专业的PP大输液塑瓶/袋生产整线解决方案。得益于德玛克在PP瓶坯注塑，PP吹瓶以及全自动灯检机，包装自动化线体等产品上取得的成就，加上行业内优秀的整合能力，为客户提供高品质的塑瓶自动化生产线。

Demark provides you with the more professional whole line solution for PP infusion bottles and bags production line. Thanks to the achievements in PP preform injection, PP bottle blowing, automatic inspection machine, automatic packaging line, and excellent industrial integrating capability, Demark is capable of offering you top quality automatic plastic packaging production line.

全自动灯检 AUTOMATIC INSPECTION

您获得的优势 Your Advantages

01 整线服务能力
Solution Service Ability

作为业内领先的塑包行业整线供应商，德玛克深谙整线工程之道，从方案设计，设备选型，工程实施，售后服务形成完善的服务链条，帮助客户更快速进入市场竞争，拔得头筹。

As one of the world front runners in the industry of plastic packaging, Demark is well versed in whole line solution, operation covers the complete service from the concept planning, equipment selection, project implementation to after sale service, help customers hit the market competition and get achievement as soon as possible.

02 优秀的行业经验
Rich Industry Knowledge

德玛克拥有100多名资深的医药机械行业从业者，为客户的生产线保驾护航，多年积累的行业经验是我们解决方案的核心价值所在。

Demark has more than 100 engineers who are expert in pharmaceutical machinery, help customer control every detail of the production line, years of industry experience is core value of our solution.

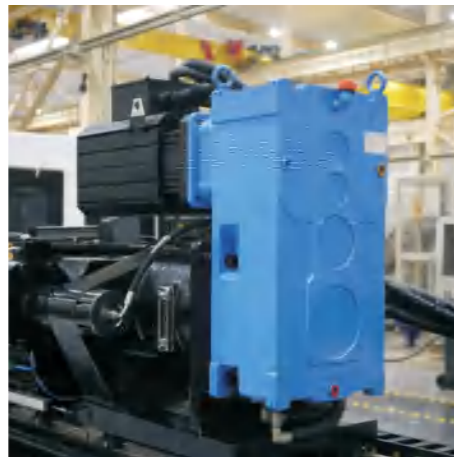
03 智慧化的生产升级
Smart Production Upgrade

同时，我们积极升级传统塑包行业的生产方式，乐于将我们所拥有的成熟自动化经验用于提升医药塑包生产线的自动化程度。

At the same time, Demark is actively upgrading the traditional solution of plastic packaging production, get our fully developed experience in automation industry integrated into the production to increase automation level in pharmaceutical packaging industry.

德玛克创新为您，带来高达48腔、72腔、96腔、128腔的高速瓶坯注塑系统，一台的效率是普通瓶坯注塑机的两倍多。领先于业内其他同行的保压阀设计，使得溶胶和保压可以同时进行，有效缩短了周期时间。同时搭配德玛克高品质瓶坯注塑模具，模外冷却机械手，基于德国倍福集中控制系统，使得您在有限的投资内收获更多的回报。

Demark brings you the ECO PP series high efficient preform injection system with many years' innovation. The system is up to 48, 72, 96, 128 cavities and double production capacity comparing with normal injection machine. With the advanced pressure hold technology, the system makes the plasticization and pressure hold at the same time therefore has a better cycle time for production. With Demark precision preform injection molds, post cooling take out robot and Gemany BECKHOFF centralized control system, the ECO PP series brings you more returns with limited investment.



独立伺服电机溶胶
ELECTRIC SCREW DRIVE

- 进口伺服电机溶胶，带来了节能和效率的双重提升。
- Independent electric screw drive brings you both plasticization and energy efficiency.



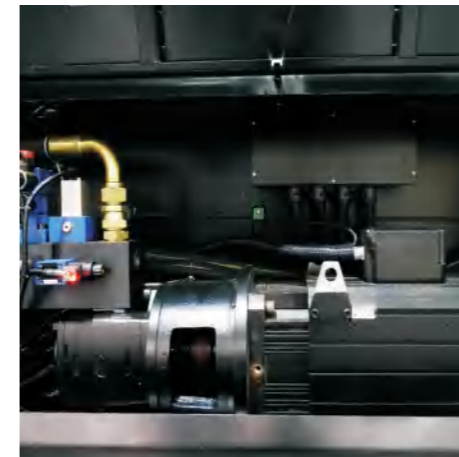
倍福控制系统
BECKHOFF CONTROL SYSTEM

- 专门为瓶坯生产全新设计的基于德国倍福的集中操作系统。
- Brand new BACKHOFF centralized control system special designed for preform production.



后冷却机械手
POST COOLING TAKE OUT ROBOT

- 三工位模后冷却机械手使瓶坯充分冷却的同时，更缩短了产品生产周期。
- Three station post cooling robot makes the preform perfectly cooled with better cycle time.



伺服液压系统
SERVO MOTOR DRIVE HYDRAULIC SYSTEM

- 液压系统全由伺服电机提供动力，大幅度节省能耗的同时保证了充足的动力。
- The hydraulic system is driven by a servo motor which ensure the lower energy consumption and sufficient hydraulic power supply.



比例阀控制
PROPORTIONAL VALVE CONTROL

- 先进的比例阀控制，使得开合模更加快速精准。
- Advanced proportional valve control technology makes the fast and precise clamping possible.



保压阀技术
PRESSURE HOLD VALVE

- 领先于业内其他同行的保压阀设计，使得溶胶和保压可以同时进行，有效缩短了周期时间。
- With the advanced pressure hold technology, the system makes the plasticization and pressure hold at the same time therefore has a better cycle time for production.

德玛克致力于打造世界级的恒温恒湿模具加工车间，保证材料在稳定的环境中满足严苛的精度标准。

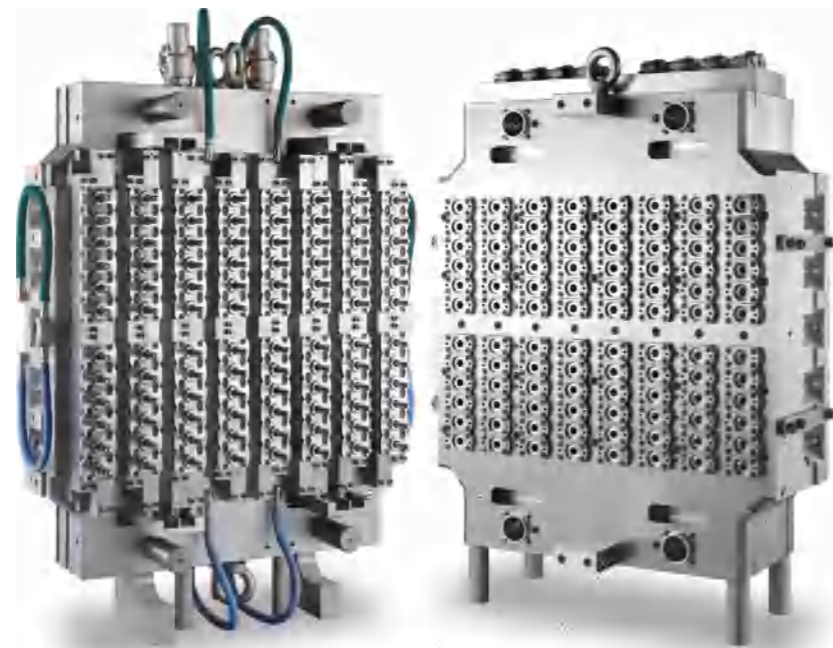
20多年模具制造经验使我们在一直走在行业前沿，完善的服务使我们始终赢得市场。

推出行业首创胚环一体式模具 (48腔, 72腔, 96腔, 128腔) 和高速ECO系列注塑机, 注塑效率相对传统配置可提高40%-45%, 机器占地面积可减少35%-55%, 人工成本可减少50%-60%。

World class stable temperature mold processing workshop. Ensure the strict precision standards in a perfect manufacturing condition.

More than 20 years mold manufacturing experience make us in the lead and perfect service make us always win the market.

Launch the industry's first preform-hanger-combo mold (48-cavity, 72-cavity, 96-cavity, and 128-cavity) and high-speed ECO-series injection molding machines; compared with traditional configuration, the injection molding efficiency can be increased by 40%-45%, the machine footprint decreased by 35%-55%, the labor costs reduced by 50%-60%.



高品质德玛克瓶坯注塑模具
 DENMARK HIGH QUALITY PREFORM MOLD

ECO PP MAIN TECHNICAL FEATURES

ECO PP 主要技术参数

MODEL			UNIT	ECO300/PP	ECO400/PP	ECO500/PP
注射单元 INJECTION UNIT	螺杆长径比	Screw L/D Ratio	L/D	25	25	25
	螺杆直径	Screw Diameter	mm	100	110	120
	射胶压力	Injection Pressure	kgf/cm ²	1194	1050	1050
	理论射出容积 (最大)	Shot Volume (Max)	cm ³	3619	4467	6107
	射出量(PP)	Shot Weight (PP)	g	2658	3216	4397
	射出量(PP)	Shot Weight (PP)	oz	93	113	154
	熔胶率(PP)	Plasticization Rate	g/s	108	157	218
	射胶速率(PP)	Shot Speed	g/s	1144	1641	2090
	螺杆行程	Screw Stroke	mm	470	470	540
	射台行程	Injection Stroke	mm	460	460	460
合模单元 CLAMPING UNIT	射嘴接触力	Nozzle Contact Force	KN	130	130	130
	锁模力	Clamping Force	T	300	400	500
	移模行程	Clamping Stroke	mm	585	670	600
	最大/小模厚	Max/min Thickness of Mould	mm	300-720	300-820	500-1300
	导杆间距 (宽×高)	Space Between Tie Bars (W×H)	mm	660×760	845×845	920×920
	顶出行程	Ejector Stroke	mm	180	180	200
	顶出力	Ejector Force	T	20	28	41
顶出杆根数	No. of Ejector Pins	PCS	9	13	10	
最高系统压力 Max. System Pressure	最高系统压力	Max. System Pressure	kg/cm ²	175	175	175
注塑模具 PREFORM MOULD	腔数(Max)	Cavity (Max)	PCS	48	72	96
电气单元 POWER UNIT	马达功率	Pump Motor Power	KW	44+44+75	55+55+100	67+67+120
	机械手功率	Robot Power	KW	36	42.5	45
	溶胶电热容量	Heater Input Capacity	KW	65	78	93
	模具加热容量	Mould Heater Capacity	KW	55	68	90
外配要求 REQUIREMENT MATCHS OUTSIDE	主机外形尺寸(长×宽×高)	Machine Size (L×W×H)	cm	930×180×250	1050×205×260	1180×250×270
	油箱容量	Tank Volume	L	1200	1200	1200
	整机重量	Machine Weight	T	26	32	39

瓶坯克重	ECO300/PP	ECO400/PP	ECO500/PP
Preform Weight	腔数/Cavity	腔数/Cavity	腔数/Cavity
(7-9)g	48	72	96, 128
(9-12)g	48	72	96, 128
(14-16)g	48	72	96, 128

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- 采用直线单伺服驱动，双铰链结构，取代原格林柱合模结构，结构简单，体积缩小，重量减轻，达到运行平稳、减小冲击、速度快的效果。
 - 采用新型钢珠型扭矩限制器，能更有效保护吹瓶机相关机构，并且能自动找正位置，减少吹瓶机维护保养的技术含量，维护人员能更轻松方便、快捷处理故障。
 - 伺服电机均采用日本OMRON进口电机，采用网络控制，稳定可靠。
 - 在不增加吹瓶机体积的情况下，加热系统采用立体式多层加热灯管加热方式，并降低了单件能耗。
 - 所用机械手指采用自动开合结构，避免产生塑料屑。
 - 采用吹瓶焊环一体化集成技术（可选用），结构简单可靠。
 - 采用高功能静电消除器，强力去除微粒与上胚焊环同步进行。
- Linear single servo motors and double hinges replace the original tie bar clamping which brings simpler structure, smaller size and less weight and make the machine run smoother, reduce shock and improve speed.
 - New design of steel ball torque limiter efficiently protect the related parts of blowing machine and automatically find the position of itself which reduces the difficulty of maintenance so that maintainer could solve fault easier.
 - All servo motors are imported from OMRON Japan, which are controlled by net that keeps them stable and reliable.
 - Without enlarging the blowing machine size, the heating system consists of vertical multi-layer heating tubes and reduce unit energy consumption.
 - All the mechanical grippers have an automatic open-close structure to avoid the generation of plastic particles.
 - Adopting integrated technology of blowing-welding as one (optional), the structure is more simple and reliable.
 - Getting rid of particles powerfully at the same time loading preforms and welding rings by using a high-performance static eliminator.



MAIN TECHNICAL FEATURES

主要技术

MODEL		UNIT	SFL6/PP	SFL10/PP	SFL12/PP	SFL16/PP	
吹瓶部分 Molding	合模力	Clamping Force	kg	40000	40000	50000	65000
	模具行程	Mold Plate Stroke	mm	65x2	70x2	70x2	70x2
	拉杆行程	Stretching Stroke	mm	300	220	220	220
	底模行程	Bottom Die Trip	mm	25	150	150	150
	瓶子间距	Cavity Spacing	mm	95.25	76.2	76.2	76.2
	模腔数	Mold Cavity	cavities	6	10	12	16
	加热行程	Heating Spacing	mm	50.8	50.8	50.8	50.8
	出瓶高度(瓶底)	Bottle Discharge Height(from bottom)	m	1.3 or so	1.3 or so	1.3 or so	1.3 or so
瓶胚尺寸 Preform	瓶坯高度	Preform Height	mm	≤145	≤ 96	≤ 96	≤ 96
	瓶坯内径	Preform Diameter	mm	18-22	18-22	18-22	18-22
	支承环直径	Support Ring Diameter	mm	28-32	28-32	28-32	28-32
瓶型尺寸 Bottle	瓶直径范围	Bottle Diameter	mm	50-85	50-76	50-76	50-76
	牙部高度尺寸	Neck Height	mm	10-25	10-25	10-25	10-25
	最大瓶身高度	Max Bottle Height	mm	250	200	200	200
	容量范围	Bottle Volume	L	0.1L-1L	0.1L-0.5L	0.1L-0.5L	0.1L-0.5L
加温部分 Heating	加热箱数量	Qty of Heating Ovens	units	12	16	20	24
	加温单元	Qty of Heating Tubes	pcs	108	112	140	168
	加温灯层数	Layers of Heating Tubes	layers	9	7	7	7
	灯管功率	Power of Each Heating Tube	kW	2	2	2	2
	最大功率	Max. Heating Power	kW	216	224	280	336
电气参数 Electricals	电压	Voltage	V	380V TN-C	380V TN-C	380V TN-C	380V TN-C
	频率	Frequency	Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	总装机功率	Total Load Power	kW	246	270	330	396
	耗电量	Power Consumption	kW·h	150	190	230	270
气源 Air System	低压压缩空气压力	Operating Pressure	bar	8-10	8-10	8-10	8-10
	低压压缩空气耗气量	Low Pressure Consumption	m³/min	3	4	5	6
	高压压缩空气压力	Blowing Pressure	bar	20-30	20-25	20-25	20-25
	高压压缩空气耗气量	High Pressure Consumption	m³/min	8	6.5	8	10
冷却水 Cooling Water	压力	Pressure	bar	4-6	4-6	4-6	4-6
	水温	Temperature Range	°C	20-30	20-30	20-30	20-30
	流量	Flow Rate	m³/h	7.5	11	14	16.3
冷冻水 Chilling Water	水温	Temperature Range	°C	5-15	5-15	5-15	5-15
	流量	Flow Rate	m³/h	6.5	8.5	10	12.5
设备重量 Weight	主机/理坯机	Weight of the Main /the Unscrambler	tonne	12T/ 0.85T	18T/ 0.7T	20T/ 0.85T	23T/ 0.85T
设备尺寸 Machine Size	主机(LxWxH)	Boundary Dimension of the Main	mm	9500x2200x2750	8000x2364x2300	10000x2364x2300	12000x2364x2300
	理坯机(LxWxH)	Boundary Dimension of the Unscrambler	mm	4000x3000x3700	4500x2400x4620	5000x2400x4620	5424x2400x4620
产量	Output	B.P.H		4500-9000	12500-16000	14500-18000	19000-24000
瓶坯材料	Preform Material			BOPP			

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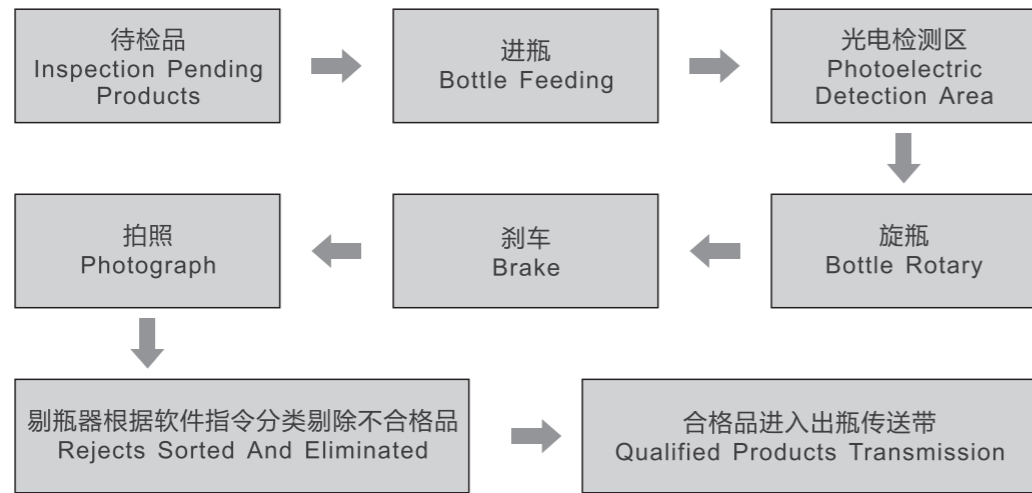
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大输液全自动智能灯检机，是针对医药生产线上透明玻璃瓶、塑瓶、可立袋等产品质量检测的全自动检测设备。大输液异物通常为玻璃屑、黑点、毛发、色块、塑料屑、纤维等异物。被检测产品在高速旋转时被制动静止，工业相机连续拍照获取多幅图像，经过计算机视觉软件系统分析比较，判断被检测产品是否合格并自动区分合格品与不合格。被检测容器进入出瓶传送带后再进入不合格传送带剔除区，经过剔瓶装置时把不合格品剔除，合格产品通过踢瓶装置后进入合格出瓶传送带。

The inspection machine is for the quality inspection of transparent glass bottles, plastic bottles, and stand bags in pharmaceutical production lines. The infusion foreign objects are usually glass chips, black spots, hair, color blocks, plastic shavings, and fibers. When the product stopped at a high speed is being inspected, the industrial camera takes pictures continuously to acquire multiple images. After analyzing and comparing with the computer vision software system, it is judged whether the inspected products are qualified, then the qualified products and the unqualified products are automatically distinguished. The inspected container on the out-conveying belt enters the defective pick-up area. After passing the bottle-sweeping apparatus, the non-conforming product is rejected and the qualified product enters the outfeed conveyor.

流程示意图

TECHNOLOGICAL PROCESS



技术特点

- 采用全伺服驱动；
- 设备为单盘；
- 可生产不同规格大小的产品。(50ml、100ml、250ml、500ml、1000ml)；
- 单进瓶、或二合一进瓶方式；
- 单出瓶方式；
- 由伺服电机驱动待检瓶高速旋瓶，利于液体内的杂质运动，以便抓拍；
- 整机结构紧凑、设计简单、维护方便、通用性强；
- 检测机构置于台面以上，完全符合GMP要求；
- 检测精度可调节，满足药厂生产要求；
- 检测数据可调取、可查阅、可储存、打印，确保工艺参数可追溯，符合GMP要求；
- 主要元器件采用进口知名品牌，如相机、光源、伺服电机、变频器、接近开关、控制器、传动轴承、滑动轴承等。

THCHNICAL FEATURES

- Adopting full servo drive;
- The machine has one inspection carousel;
- Can inspect different formats of products (50ml, 100ml, 250ml, 500ml, 1000ml);
- Single-conveyor bottle infeed, or double-conveyor-to-single conveyor bottle infeed;
- Single-conveyor bottle outfeed;
- The high speed rotation of bottles are driven by servo motor which contributes to capture the movement of impurities in the liquid;
- The whole machine is of compact structure, simple design, easy maintenance and strong versatility;
- The inspection part is set on board which completely meets GMP Requirements;
- The adjustment of inspecting accuracy meets the production requirements of pharmaceutical factory;
- The inspection data is able to been transferred, read, stored and printed which ensures the technological parameter traceable and meets GMP requirements;
- Adopting famous international brands main components, such as camera, light source, servo motor, frequency converter, proximity switch, controller, drive bearing and sliding bearing.

PRAMETERS OF THE SERIES

机器系列参数

系列名称 NAME OF THE SERIES	单盘-36头灯检 Single-Carousel-36-Head Inspector	单盘-48头灯检 Single-Carousel-48-Head Inspector	单盘-48头灯检 Single-Carousel-48-Head Inspector	仿人工灯检 Artificial Inspector
主要型号 TYPICAL MODEL	SF-250	SF-300	SF-400	FR-400
机器速度(250ml) MACHINE SPEED(250ml)	15000BPH	18000BPH	24000BPH	24000BPH
机器功率 MACHINE POWER	14KW	13KW	15KW	6KW
机器外形尺寸 MACHINE BOUNDARY DIMENSION	2.5x2.1x2.1m	3x2.7x2.1m	3.1x3.0x2.1m	7x1.5x2.1m
机器重量 MACHINE WEIGHT	3T	4.5T	5T	4T
检测产品 INSPECTION PRODUCTS	塑瓶、可立袋、玻璃瓶及其他透明瓶装容器检测 Plastic bottle, Stand-up/Soft Bag, glass bottle and other transparent bottle			
适应规格 INSPECTION SPECIFICATION	50-1000ml大输液塑料瓶或玻璃瓶及软装包装 50-1000ml IV plastic bottle or glass bottle or soft bag			
检测项目 INSPECTION ITEMS	可见异物玻璃屑、金属屑、塑料屑、毛发、纤维、色块、装量等 Visible particles like glass splinters/ metal shavings/ plastic debris/ hair/ fibers/ color block/ volume and so on			
检测精度 INSPECTION ACCURACY	≥40μm			
电压 VOLTAGE	3P 380V 50Hz			
压缩空气 COMPRESSED AIR	0.7Mpa			
工作台高度 OPERATION HEIGHT	900mm			

德玛克保留对产品进行修改的权利，规格如有变动，恕不另行通知。
Demark reserve the rights to make any product improvement or specification change without prior notice.

该全自动大输液后道包装系统是新一代的自动化包装线，可将大输液瓶/袋输送、贴标、开箱、理瓶、装箱、贴标、封箱、打码、输出、入立库（入立库可选）等作业全部实现自动化，从而大幅度减少工人数量，并极大地提高工作效率。

Our fully automatic large-volume-parenteral end-of-line packaging system is a new generation automated packaging line, which can achieve full automation of such processes, as in-line transportation, labeling, carton opening, bottle unscrambling, carton loading, labeling, carton sealing, bar code printing, out feeding, and automatic storing(optional), thus, substantially reducing the number of workers and greatly improving working efficiency.

适用范围

- 本线适用大输液50-1000ml玻璃瓶，塑瓶和可立袋/软袋等的纸箱包装。
- 另可按客户需求进行多种配置。

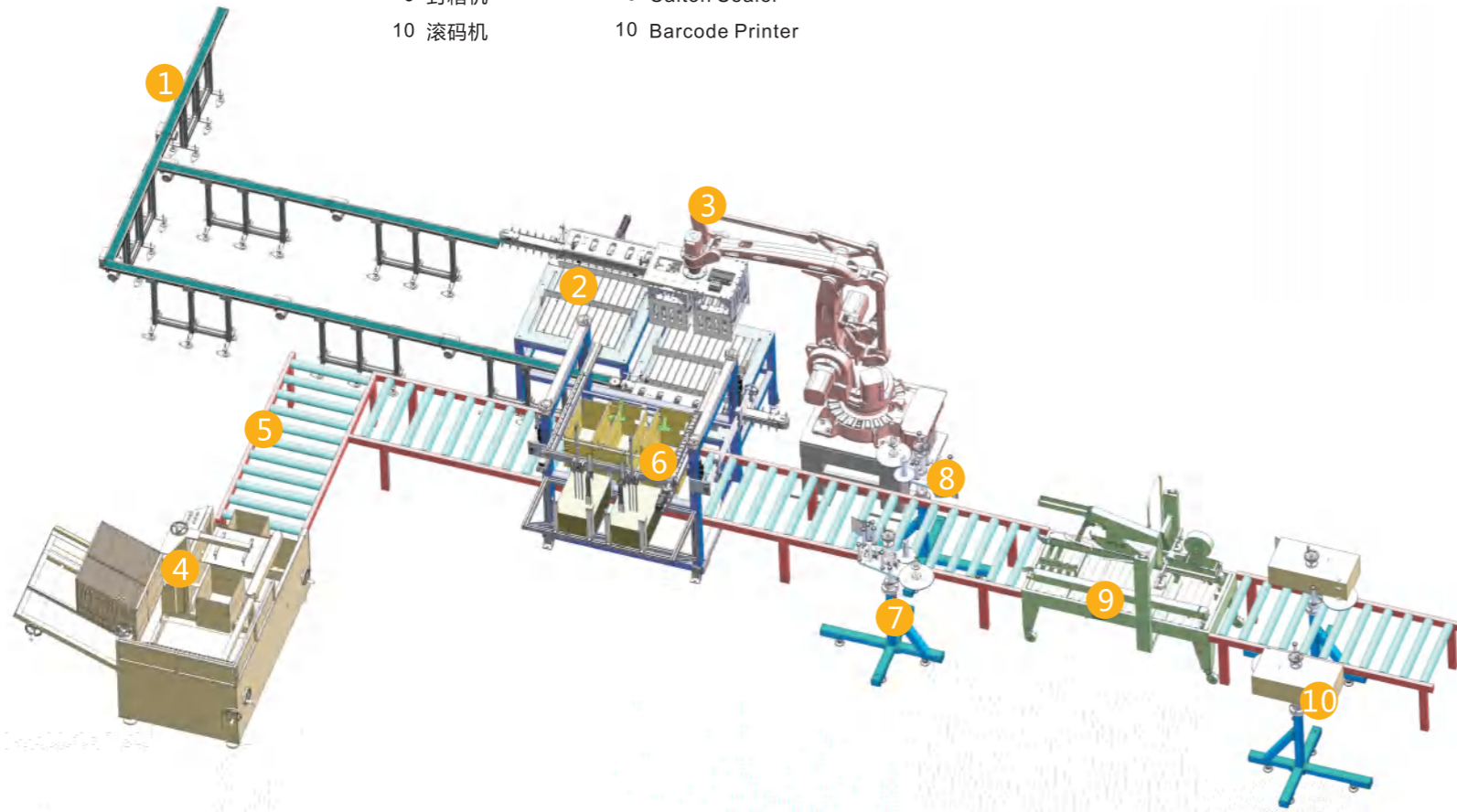
SCOPE

- This line is suitable for carton packaging of large-volume-parenteral 50-1000ml glass bottles, plastic bottles and stand-up bags/soft bags.
- A variety of configurations can be provided according to customers' specific needs.

工作流程示意图

WORK FLOWCHART

- | | |
|-----------|--|
| 1 输液瓶链板线 | 1 Bottle Chain Scraper Conveyor |
| 2 理瓶机 | 2 Bottle Unscrambler |
| 3 装箱抓手 | 3 Bottle Gripper |
| 4 开箱机 | 4 Carton Opener |
| 5 纸箱滚筒输送线 | 5 Carton Roller Conveyor |
| 6 纸箱定位扒箱机 | 6 Carton Positioning Unclosing Machine |
| 7 侧贴标机 | 7 Lateral Labeler |
| 8 正面贴标机 | 8 Frontal Labeler |
| 9 封箱机 | 9 Carton Sealer |
| 10 滚码机 | 10 Barcode Printer |



LIST OF MAIN EQUIPMENT & COMPONENTS
主要设备&部件清单

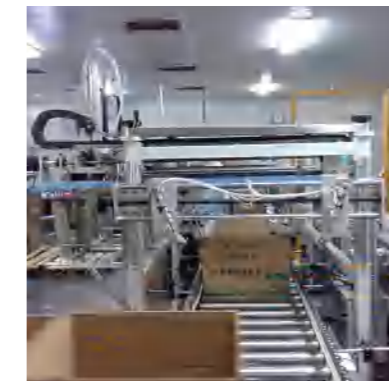
序号 NO.	主要设备&部件 MAIN EQUIPMENT & COMPONENTS	规格 SPECS	数量 QUANTITY	生产厂家&供应商 MANUFACTURER & SUPPLIER	备注 REMARKS
1	多关节机器人 Multi-joint Robot		1	FANUC (ABB or KUKA)	含控制箱 Control Box Included
2	桁架式纸板放置机构 Truss-type Carton-board-placing System		1	DEMARK	
3	抓手（单爪） Bottle Gripper (single)	气动夹爪 Pneumatic	1	DEMARK	
4	开箱机 Carton Opener		1	DEMARK	
5	封箱机 Carton Sealer		1	DEMARK	
6	可立袋输送线 Bottle Conveyor		1	DEMARK	铝合金框架，塑料板链 Aluminum alloy frame, plastic chain scrapers
7	纸箱输送线 Carton Conveyor		1	DEMARK	碳钢框架，不锈钢滚筒 carbon steel frame, stainless steel roller
8	可立袋装箱前整理机构 Bottle Unscrambler		2	DEMARK	
9	拨箱机构 Carton Unclosing System		1	DEMARK	
10	安全围栏 Safety Fence		1	DEMARK	
11	总控系统 Main Control System		1	DEMARK	



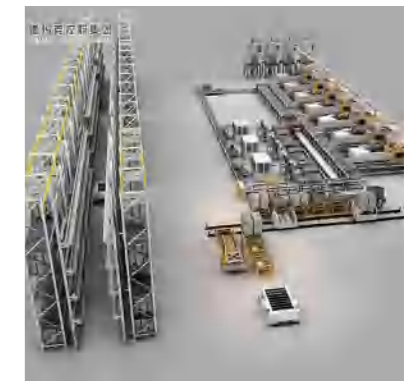
理瓶 & 抓手
BOTTLE UNSCRAMBLER & BOTTLE GRIPPER



装箱机器人
LOADING ROBOT



纸箱定位拨箱机构
CARTON POSITIONING UNCLOSING SYSTEM



立库
AUTOMATIC STORAGE SYSTEM