

全自动喷丝板检测系统

Automatic Spinneret Inspection System

产品简介 Product Description



喷丝板的全寿命跟踪 纺丝过程的精细化管理

The whole life tracking of spinneret, the delicacy management of spinning process

本系统采用先进的机器视觉技术，全自动检测喷丝板上的每个喷丝微孔，并对其关键参数进行精确的量化和评价，实现对喷丝板的进货质量检验、清洗效果检验、磨损磨损检验，提高喷丝板的检测效率、效果和上机率，提升优等品率，减少用工量，降低了劳动强度。

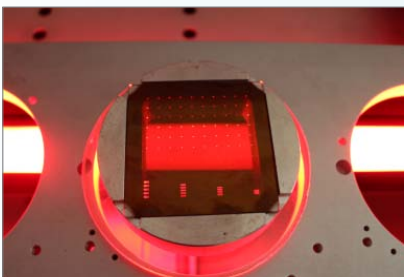
本系统通过对喷丝板的圆形、矩形、三叶和十字等各种形状的微孔进行直径、周长、面积、圆度、磨损、分布角度、狭缝宽度、瓣长瓣宽、外接内切圆直径和边缘光洁度等参数的测量，实现对微孔的综合评价，有效减少人工误判，大幅提升喷丝板的检测效率和上机合格率，提高了生产自动化程度。

本系统运用专用软件的数据和图表功能，可以分析检测数据，同时将检测结果存入数据库，以便查询、打印，并可以跟踪、追溯到系统检测的每一块喷丝板，实现对纺丝生产过程的精细化管理。

The system can be used for scanning each capillary of spinneret automatically by adopting advanced video image analysis so as to conduct accurate quantification and evaluation for its key parameters. The system is designed with the ability to inspect the incoming quality, the cleaning effect and the abrasion level of spinneret, all of which has an important significance to improve the inspection efficiency and the passing rate of first-class spinneret, thus to reduce the labor costs and the labor intensity.

Through the measurement of diameter, perimeter, area, profile, wear, distribution angle, slit width, lobe length and lobe width, circumscribed & inner circle diameter and edge roughness of spinneret capillaries in varies patterns such as circular, rectangle, trefoil, cross shape and so on. The system can be applied for comprehensive evaluation of capillary cleanliness to reduce the artificial error probability, obviously enhance the spinneret inspection efficiency, raise the spinneret passing rate and finally promote production automation.

With application of data and diagram built in the special software, the system can be used for analyzing data and meanwhile saving the test results into database for checking, printing, and furthermore, tracing back to each spinneret inspected previously in order to realize the delicacy management of spinning production process.



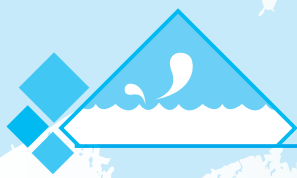
光学校正片
Optical correction slice



校准证书
Calibration Certificate



专利技术证书
Certificates of patent technology



全自动喷丝板检测系统

Automatic Spinneret Inspection System

产品性能 Product Characteristics

1) 本系统可对新进的喷丝板进货检验，降低采购风险，并可以根据正负公差进行筛分，提高产品的优等品率。

This system can reduce procurement risk through inspection of incoming quality of spinneret, and it is able to screen spinneret according to its tolerance of plus or minus so as to improve the rate of superior products.

2) 本系统对清洗完毕的喷丝孔进行精确检测和分析判断，确保每个喷丝孔上机前的洁净，降低飘丝和断丝的可能。

This system has the ability of conducting a precise inspection and analysis of spinneret to ensure the cleanliness of each spinneret capillary prior to use, thereby preventing the chemical fiber from floating and broken during the production process.

3) 本系统可以对长期使用的喷丝板光洁度和喷丝孔磨损进行测量、跟踪和管理，为修板和报废提供数据依据。

This system can provide measurements, tracking and management for spinneret roughness and capillary abrasion degree of long-term used spinnerets, which gives reliable test data basis for spinneret repairing and scrapping.



进货检验
Incoming inspection



清洗后检验
Inspection after cleaning



报废管理
Scrapping management

检测流程 Inspection Process



产品选型 Product Selection

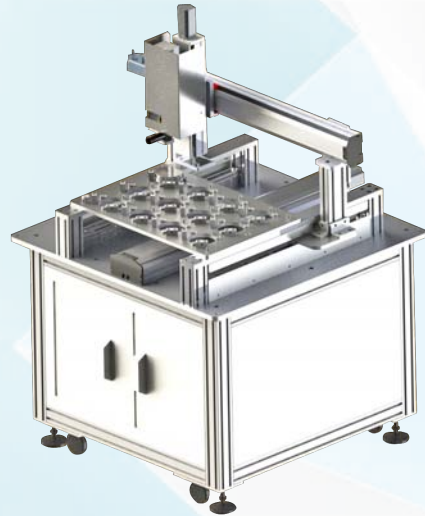
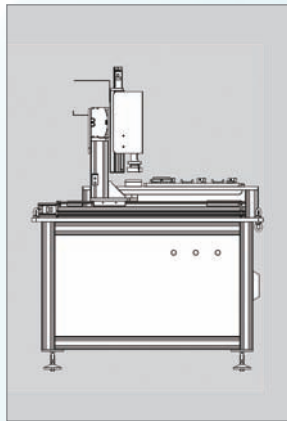
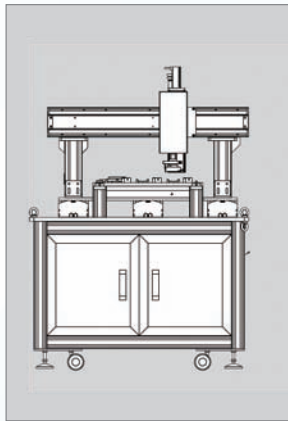
命名规则 Naming rules



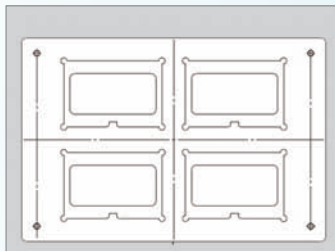
1) 长丝喷丝板 Filament spinneret

本系统针对化纤行业长丝喷丝板的外形尺寸和特点，在有限的检测范围内最大化单批次检板数量，可检测6-120块长丝喷丝板（视喷丝板外径而定）。另外配有广角镜头，喷丝板在路径扫描和检测的时候无需固定位置即可达到检测目的。

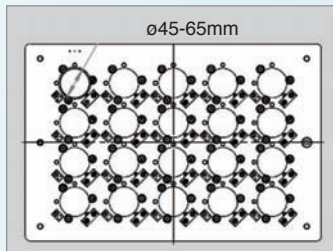
This system aims at the dimensions and characteristics of chemical fiber industry standard filament spinneret, to maximize spinneret quantity in limited detection area, single batch can detect from 6 to 120 pieces of spinneret (according to the spinneret OD). This system is equipped with wide-angle lens so as to make sure the route scanning and inspection function without positioning.



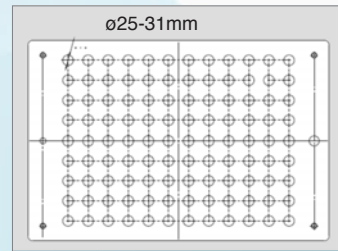
ASIS-64F型（适用于长丝喷丝板 for filament spinneret）



矩形长丝喷丝板支架
Rectangular spinneret holder



20工位喷丝板支架
20-station spinneret holder



108工位长丝喷丝板支架
108-station spinneret holder



全自动喷丝板检测系统

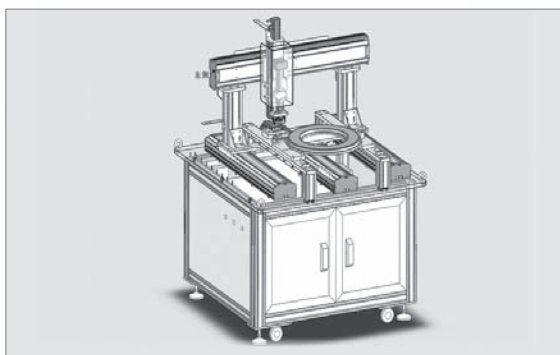
Automatic Spinneret Inspection System

产品选型 Product Selection

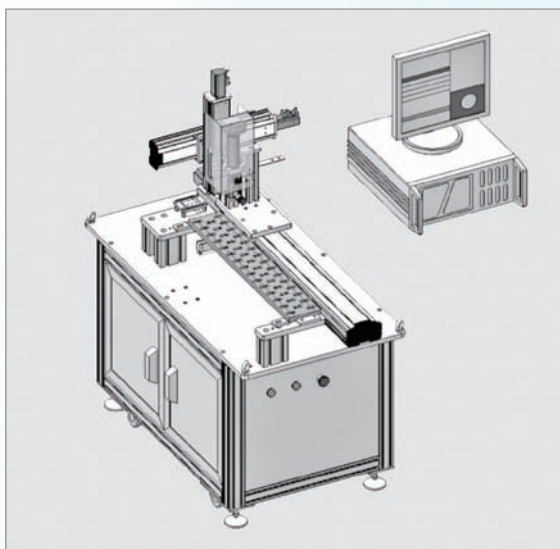
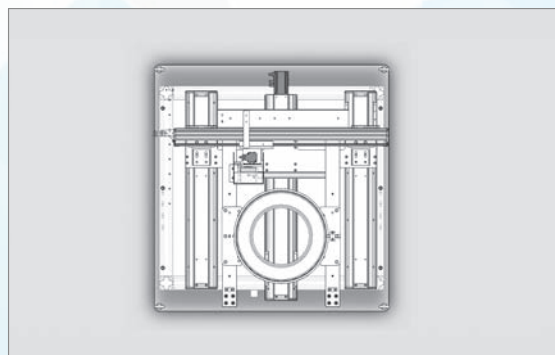
2) 短丝喷丝板 Staple fiber spinneret

根据短丝系列喷丝板的特有的外形尺寸和微孔分布，本系统带有高效简洁的短丝喷丝板特有搜索路径，仅需搜索喷丝板上部分的微孔即可并计算出喷丝板上微孔的实际分布，有效地减少了微孔的路径搜索时间，保证喷丝板上的每一个微孔都能够精确地找到并检测。

According to staple fiber spinneret's specific dimensions and capillary distribution, the system has neat and unique search path, only need to search a spinneret plate on the part of the microporous, and then calculate the actual distribution of spinneret hole, effectively reduce the path search microporous cable time, guarantee each spinneret capillary is able to be accurately located and detected.



ASIS-65S型 (适用于短丝喷丝板 for staple fiber spinneret)



ASIS-62SP型
(适用于氨纶喷丝组件 for spandex spinning components)

3) 非标定制 Non-standard customization

本系统可根据一些差别化纤维喷丝板组件的特性定制特殊的检测功能，可实现对海岛型纤维分配板上、下每簇微孔的同心度和洁净度检测和DIO喷丝板和双组分复合纺斜孔喷丝板的检测等。另外针对无纺布、工业丝喷丝板和特殊工艺的喷丝组件均可记性非标定制，并根据客户需要制定适合的检测软件。

The system can also be based on the characteristics of some differential fiber spinnerets to customize special inspecting functions for concentricity and cleanliness of each cluster apillaries of the sea island fiber distribution boards as well as irregular capillaries of DIO and inclined capillaries of biocomponent spinneret etc. Besides, this system can also be customized for non-woven fabrics, industrial yarn spinnerets and the spinning elements with special technology, and formulate appropriate detection software according to the customer requirement.

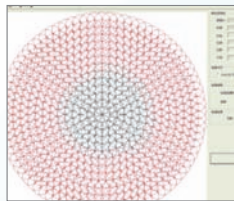
软件特点 Software Features

该软件包含进货检验、用户管理、系统配置、路径生成、系统调试、微孔检测和数据库管理等7个模块，能够实现喷丝板进货质量检验、清洗效果检验和喷丝板使用过程和寿命管理。

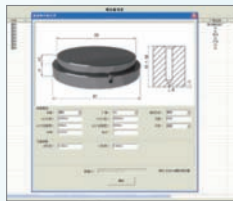
The system software includes the following seven modules, which has the ability to perform incoming quality inspection and testing of cleaning effect as well as life management of spinneret in normal use.



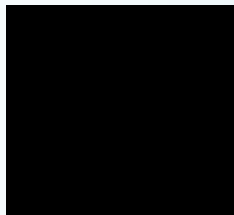
- 1) 具有微孔检测功能
Automatic capillary measurements
- 2) 具有数据库应用功能
Function of database application
- 3) 具有脏孔自动定位
Automatic capillary location, laser marking, blowing and scanning
- 4) 具有图象自动居中矫正功能
Automatic image focusing recalibration
- 5) 具有板面倾斜自动矫正功能
Automatic adjustment and correction of tilted spinneret
- 6) 具有高速度检测路径生成系统
Path generation system of high-speed inspection



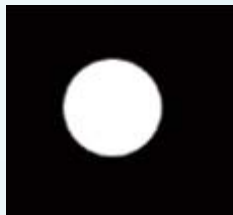
搜孔路径图
Capillary Searching
Path Diagram



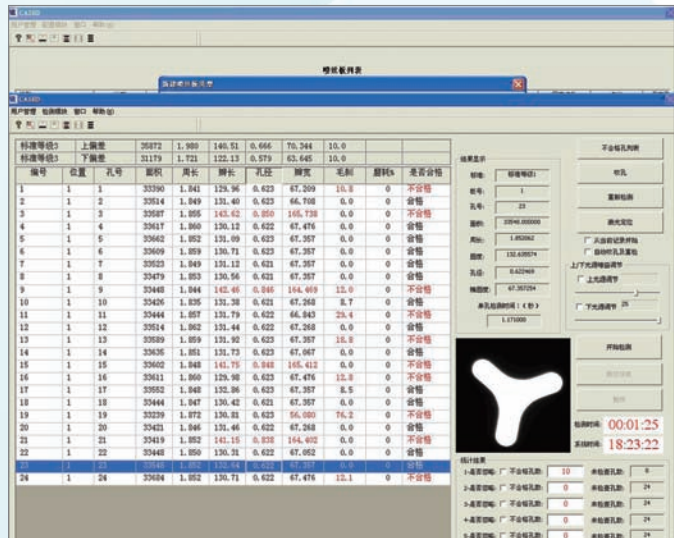
喷丝板参数显示窗
Display window of
spinneret parameter



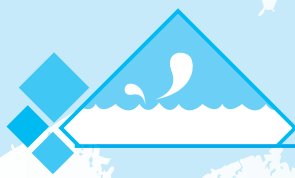
扁平孔
Strip Shape



圆形孔
Circular Shape



三叶孔检测主界面
Main interface of trefoil capillary inspection



全自动喷丝板检测系统

Automatic Spinneret Inspection System

硬件配置 Hardware Configuration

| 序号 No | 名称 Item | 描述 Description |
|----------|---|--|
| 1 | CCD相机 CCD Camera | 德国进口200万像素工业相机 2 megapixel digital camera made in Germany |
| 2 | 镜头 Camera lens | 德国进口7倍变焦高清晰度远心工业镜头 7 times zoom high-definition telecentric lens made in Germany |
| 3 | 光源 Light source | 机器视觉高亮度LED光源 Machine vision high brightness LED light source |
| 4 | 工控机 IPC | 加固工业计算机 Reinforced computer |
| 5 | 运动控制 Motion control | 四轴高精度伺服控制，运动精度 $\pm 0.01\text{mm}$ Four axis servo control, motion accuracy of $\pm 0.01\text{mm}$ |
| 6 | 支架及夹具 Support and clamp | 根据客户需求定制高精度的支架及夹具 Support and clamp of high precision can be customized |
| 7 | 定位激光点 Location of the laser spot | 单点透镜激光模块 Single lens laser module |
| 8 | 适用化纤类型 Type of chemical fiber | PET、PA、PAN、PP、PU等纤维喷丝板 PET、PA、PAN、PP、PU and so on |
| 9 | 适用喷丝板规格 Specifications of Spinneret | 长丝 $\leq\phi 120$ ，短纤 $\leq\phi 410$ ，无纺布 $\leq 7100\text{mm}$ Filament spinneret $\leq\phi 120$ ，Staple fiber spinneret $\leq\phi 410$ Non-woven spinneret $\leq 7100\text{mm}$ |
| 10 | 检测数量 Inspection Amount | 1-120块/批，视喷丝板外形尺寸而定 1-120 pieces each time according to the spec. of spinneret |
| 11 | 检测孔径范围 Aperture range | 0.01-1mm，可以是圆孔或者异形孔 0.01-1mm. It can be circular or irregular |
| 12 | 单孔检测时间 Inspection time for each hole | 0.1-0.9s，视喷丝板空间距而定 0.1-0.9s according to spatial distance of spinneret |

- 可以选配喷丝板编码扫描系统
Code scanning system for spinneret is optional