



中国恒天
CHTC

FONG'S®
立信染整

SUPERWIN

High Temperature
Single Flow Package
Dyeing Machine

高温筒子纱单向外流染色机

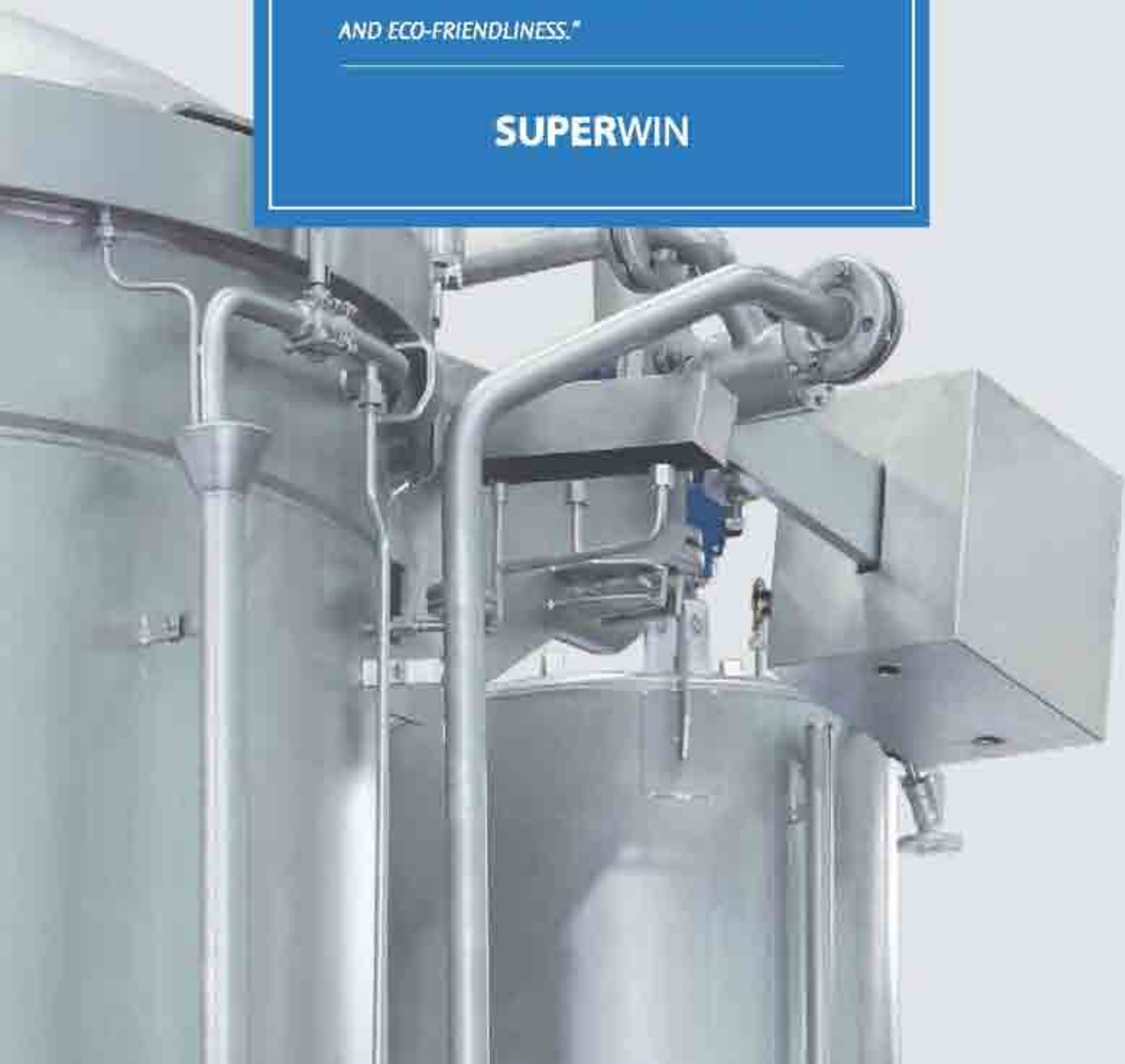




“突破一般单向外流染色机，浴比低近1:3，配合创新浪涛染色技术，加上新型水泵及高效马达，全面提升染色效能，达到省时节能效果。”

"THE REVOLUTIONARY WAVE DYEING TECHNIQUE AND INTELLIGENT CONTROL REDUCE THE LIQUOR RATIO CLOSE TO 1:3. SUPERWIN EMPOWERS YOUR PRODUCTION TO THE LEADING EDGE OF EFFICIENCY AND ECO-FRIENDLINESS."

SUPERWIN



殊榮

DISTINCTION

本产品荣获2013香港工商业奖：

SUPERWIN is Awarded 2013 Hong Kong Awards for Industries :

「机器及机械工具设计大奖」

MACHINERY AND MACHINE TOOLS DESIGN GRAND AWARD



颁奖单位：香港中华厂商联合会
Presented by: The Chinese Manufacturers' Association of Hong Kong

目录 CONTENT

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Part 1

产品介绍

PRODUCT INTRODUCTION

SUPERWIN 高温筒子纱染色机突破一般单向外流染色机，浴比低至1:5，配合创新浪涛染色技术，采用精密电脑智能控制水流于染色期间之变化，加上新型水泵及高效马达，全面提升染色效能，达到省时省能效果。

SUPERWIN High Temperature Package Dyeing Machine is more than an ordinary dyeing machine running single I-O flow. The revolutionary wave dyeing technique and intelligent control reduce the liquor ratio close to 1:3. SUPERWIN empowers your production to the leading edge of efficiency and eco-friendliness.

- | | | |
|----|-------------|--|
| 06 | 单向外流染色技术 | Single Inside-Out Flow Technology |
| 08 | 创新浪涛染色技术 | Innovative Wave Dyeing Technology |
| 10 | IIR综合智能水洗系统 | Integrated Intelligent Rinsing |
| 12 | 环保节能的生产优势 | Eco-Friendly Dyeing Equipment |
| 12 | 适用于多种物料 | Versatile for Various Material Types |
| 13 | 正压榨水 | Pressurized Dehydration |
| 13 | 高温直接排放 | High Temperature Drain |
| 14 | 快思逻辑温控技术 | Fuzzy Logic Temperature Control Technology |

Part 2

操作系统

CONTROL SYSTEM

配置自动化操作系统，控制器操作简易，有效管理各个染色工艺安排，使生产更易掌握。

Equip with fully automatic control system, and user-friendly controller, manage all necessary dyeing profiles effective and hence easy of production control.

- | | | |
|----|-----------|-------------------------|
| 16 | FC30程序控制器 | FC30 Program Controller |
|----|-----------|-------------------------|



Part 3 外型结构 EXTERNAL STRUCTURE

备有多项独特配置，使整体性能更加完善，大大提升了生产效率。
Equipped with exclusive features, the machine has improved in its all-round performance and productivity.

- 18 | 快速卸载纱架 Package Unloading Basket
- 19 | 底部防漏纱竹 Bottom Leak-proof Spindle
- 19 | 无泄漏快速顶锁 Leak-proof Fastener

Part 4 数据分析 DATA ANALYSIS

我们以单向与双向的染色技术作对比，分析得出的数据供用户参考。
We compare two different technologies for users' reference.

- 20 | 试验对比 Performance Comparison
- 21 | 案例参考 Case Study

Part 5 其他 OTHER

关于立信染整在纱线染整的行业上的其他产品介绍，及完善的售后服务。
Related products in Fong's yarn dyeing machineries and aftersales services.

- 22 | 其他产品介绍 Other Machinery
- 24 | 技术服务及保养 Service and Maintenance

单向外流染色技术

SINGLE INSIDE-OUT FLOW TECHNOLOGY

单向外流 盛载染液实况

运行外流(I/O)时，染液由主泵进入纱架及纱竹，再经纱管和筒子纱内层，最后流经整个筒子纱回到带热盘管的主缸，只要缸底维持一定水量，就可以保持主泵压力稳定，从而保证压差和流量稳定，没必要所有筒子纱都被染液覆盖，因此更低的浴比就得以实现。

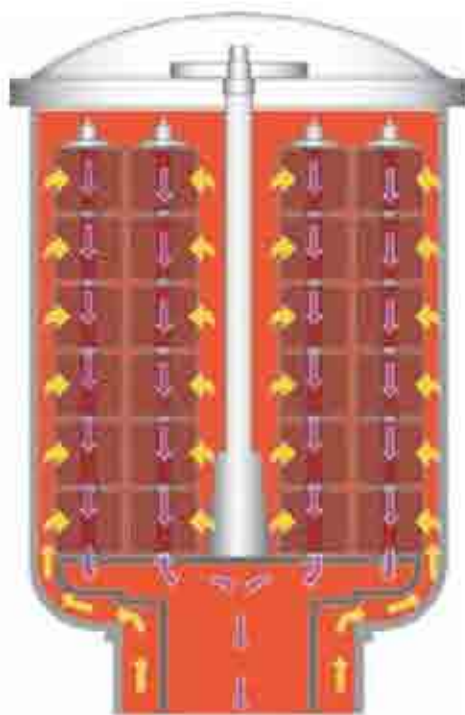
Single Inside-out Flow Packages and Liquor loading scenario

During a Single Inside-out Flow process, dye liquor discharged from the pump enters the carrier and passes through the spindles, then reaches the packages and diffuses outwards. Only a sufficient water level is required at the kler bottom to maintain steady pump pressure and it is not necessary to have all packages fully immersed with liquor, hence lower liquor ratio is achieved.

传统内外双向染液行程 The Route of Liquor flow for Dual-Flow operation (O/I)

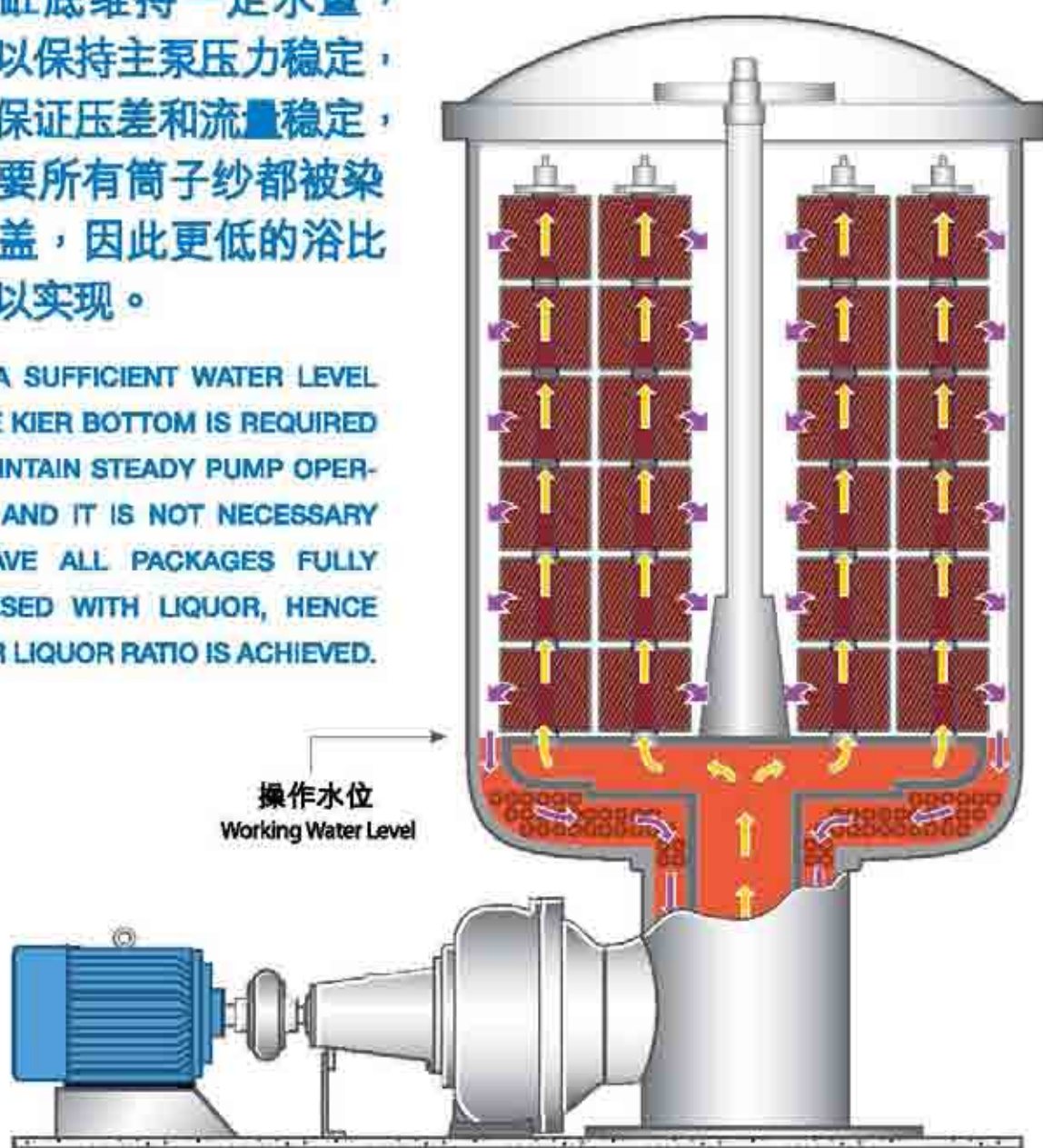
传统内外双向不可避免运行内流 (O/I) 操作时间，因染液是由筒子纱外层流经整个筒子纱，纱管和纱竹，继而经换向器回流至热交换器和主泵，主缸内的水位必须盖过顶锁，否则筒子纱内之负压就会将水面以上的筒子纱从表面吸入空气，造成压差和流量不稳，影响染色品质。

Outside-In flow process is inevitable during a Dual-flow operation, thus dye liquor has to diffuse into the packages through its outside surface, passing through the spindles, reversal device, heat exchanger and eventually return to the pump. It is necessary for all the packages and fasteners to be immersed under water level to prevent air suction through the exposed packages outside surface, otherwise it will cause pressure difference and unsteady flow which may affect the dyeing result.



只要缸底维持一定水量，就可以保持主泵压力稳定，从而保证压差和流量稳定，没必要所有筒子纱都被染液覆盖，因此更低的浴比就得以实现。

ONLY A SUFFICIENT WATER LEVEL AT THE KIER BOTTOM IS REQUIRED TO MAINTAIN STEADY PUMP OPERATION AND IT IS NOT NECESSARY TO HAVE ALL PACKAGES FULLY IMMERSED WITH LIQUOR, HENCE LOWER LIQUOR RATIO IS ACHIEVED.



单向外流(I/O)染液行程

The Route of Liquor flow for Single Inside-out Flow operation (I/O)

创新浪涛染色技术

INNOVATIVE WAVE DYEING TECHNOLOGY

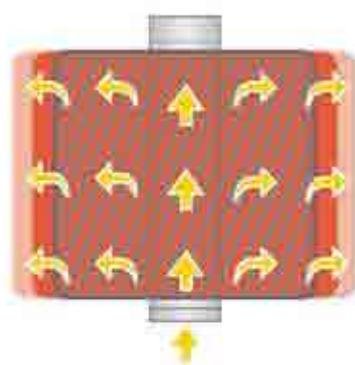
创新浪涛染色技术

传统筒子纱染色机具有换向功能，于染液流向变换的过程中筒子纱受液压骤变的影响，纱线得以舒张或收缩，增加匀染，使纱线能更有效上色。由于单向染色没有换向功能，要做出液压上的变化，需依靠主泵不断调整速度做成。浪涛染色原理是利用主泵透过特定的节奏变换频率做成压差，犹如浪涛一波一波地冲击纱线，使筒子纱于单向染色的情况下仍可依靠压差变动令纱线不断来回运动，做到双向染色的优良效果。定时骤降的频率亦间接减低主泵耗电量，达到省水、省电和省却换向所耗时间。

Innovative Wave Dyeing Technology

Owing to the reversal function on conventional yarn dyeing machines, the packages could be expanded and contracted by pressure changes during reversal of flow, hence increasing the effectiveness and evenness in dyeing. Since the single flow concept has no flow reversal feature, the pump should vary its speed to generate pressure difference.

By executing a specific period of change in pump frequency, smashing the packages like waves such that it could move under differentiating pressure would lead to perfect utilization of the advantage of dual flow concept, in a much lower demand of water and electricity.



纱线舒张时状态
Expanded



纱线收缩时状态
Contracted

犹如浪涛一波一波地冲击纱线，使筒子纱于单向染色的情况下仍可依靠压差变动令纱线不断来回运动，做到双向染色的优良效果。

SPECIFIC PERIOD OF CHANGE IN PUMP FREQUENCY, SMASHING THE PACKAGES LIKE WAVES SUCH THAT IT COULD MOVE UNDER VARIED PRESSURE TO PERFECT UTILIZATION.



IIR 综合智能水洗系统

INTEGRATED INTELLIGENT RINSING

织物漂染「无水不行」，然而传统上水洗过程仅靠肉眼和经验判断，缺乏数据化的客观标准，令漂染发展裹足不前。立信采集了不同颜色的数据，寻找个中的数学关系，建构出一个内嵌式计算模型，用作分析及记录各种颜色在水洗过程中的指数变化，大大提高了染色机水洗的效率和预测能力。

It is hard to achieve waterless dyeing and traditional rinsing relies on human eye. The lack of numerical standard hinders the development in auto dyeing.

Fong's has built an algorithm to compute color changes by sampling, hence improving the efficiency and predictability.

智能控制

为追求高效自动化染色用家而设，令染色过程智能控制，更加先进准确。以独有专利技术开创新颖环保水洗程序，取代以往人手取样或凭操作经验每次定义水洗完成时间，自动运作至合适清洁条件。

重现性高

革命性主动于排放进行辨色及辨别含盐度以侦测水洗完成进度，用水耗时一目了然。水洗效果每次准确，重现性高，为产品质量重新定义更优秀标准。

提高效率

缸内即时变化的染液水质特性，能在线清楚显示及精确分析，清油分流辨识更加准确，厂内排放管理更有条理，有效提高生产效率。节能、高效与质量尽在掌握之中。

Intelligent Control

Designed for customers seeking high degree of automation, to replace manual sampling during rinsing or determining rinsing time by experience.

High Reproducibility

The revolutionary system monitors both the residual colour and conductivity of liquor discharged during rinsing; accurately determine the water consumption for rinsing, the degree of reproducibility is highly improved.

Enhanced Efficiency

Any slight changes are clearly shown in real time for analysis, making the drainage progress more organized.



精密机械装置
High precision
Device

IIR 荣获：IIR has won:

2013 香港工商业奖「科技成就奖」
THE TECHNOLOGICAL ACHIEVEMENT AWARD
OF HONG KONG AWARDS FOR INDUSTRIES 2013

颁奖单位：香港科技园

Presented by: Hong Kong Science & Technology Parks

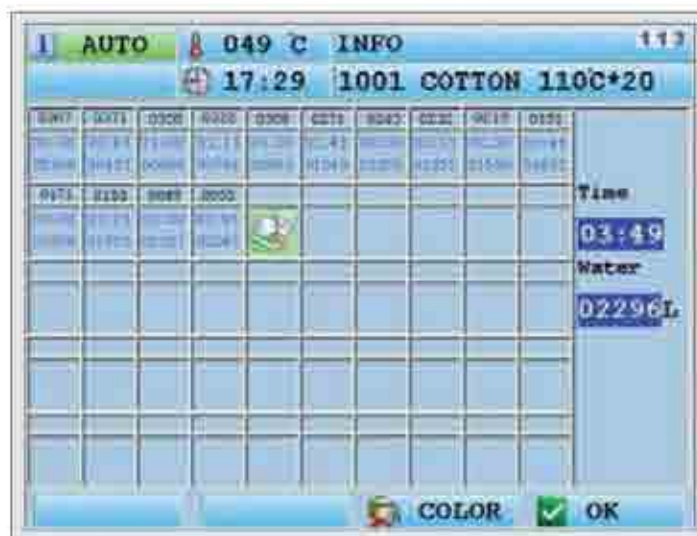
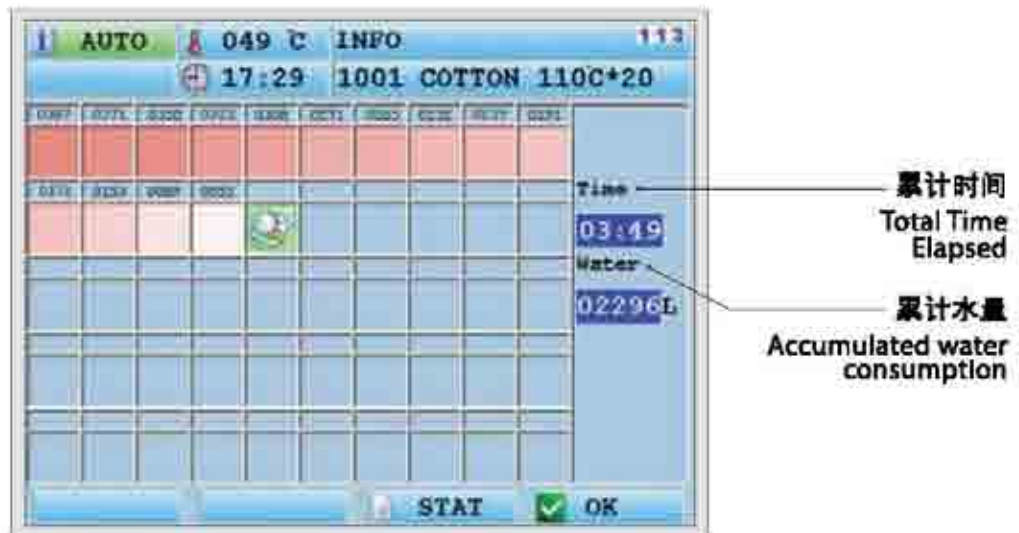


下图为FC30的IIR功能显示画面：

The following screenshots show the IIR function on FC30:

在方格中可显示每1个取样点的当前指数值及颜色，右侧还可显示实时的
 的洗水时间及用水量。

Each grid shows the color of latest sample obtained and its corresponding Index, where the total time elapsed
 and accumulated water consumption are shown on the right.



环保节能的生产优势 ECO-FRIENDLY DYEING EQUIPMENT

以低近至1:3浴比运行，可处理多种不同的染色工艺包括比较浅色的敏感色染料。

在节能减排的大方向下，所有厂家都以降低浴比为首要设计条件，务求以最少的水处理最多的纱线，这样便可替使用者省回不少用水的成本，从而吸引更多的买家。然而追求低浴比只是单纯的数字游戏，并没有考虑对染整成品的影响，导致很多标榜低浴比的染色机处染品质参差，增加质量控制的难度，往往令生产商得不偿失。故此在降低浴比的同时保持处染质量，达致相互平衡方为取得明显的进步。



我们在降低浴比的方向上，选择了单向外流染色技术，因为不用以染液覆盖所有筒子纱，机身内的水位可降至适当的水平操作，大大减少行机水量。因为单向染色的关系，染液透过脉冲方式弥补渗透时的压差，便可解决低浴比匀染不足的问题。

Operates at liquor ratio as close as 1:3 and compatible to various kind of dyeing applications including light and sensitive color.

Under the trend of green production, it is the first priority for most dyeing machinery manufacturer to reduce the liquor ratio, hence to maximize the dyeing capacity under lower amount of water. However seeking lower liquor ratio is merely playing numbers without considering the dyeing quality. Some machines claimed a low ratio yet they perform badly in quality assurance, which costs even more from recovering those batches. All in all it is considered a progress only if the quality is maintained.

Fong's uses the single flow dyeing technique in the direction of lowering liquor ratio. Since it does not require full submerging of yarn packages the water level inside the machine is very much lowered. Owing to single flow dyeing, a pulsating control is applied to compensate the pressure difference during dye penetration, hence solving the unevenness commonly seen using this technique.

适用于多种物料 SUITABLE FOR VARIOUS MATERIAL TYPES



筒子纱
Package



毛球
Muff



绞纱
Hank



经轴纱
Warp Beam



散纤维
Loose fibre



拉链
Zipper



窄带
Tape



魔术贴
Magic Tape

正压搾水

PRESSURIZED DEHYDRATION

正压搾水是用在排水后的一个工序，能有效快速地将纱线间的多余水份挤出。

正压搾水系统是使用空气压缩机向纱缸内进行加压，将经轴纱或筒子纱内所含过量的水份以高压力的空气瞬间排放，以内流方式将筒子纱内多余水份挤出。

The pressurized dehydration is achieved by injecting compressed air into the vessel to squeeze residual water.

The residual water content in packages or beams is removed by a sudden drop of pressure built up by a compressor.

注意 Note

一般来说，经轴纱经正压搾水处理后，含水率均可保证达到90%，而搾水的效率需要视乎纱线本身的密度和打纱的缠绕紧度；但筒子纱因为纱筒与纱筒之间的间隙难以保证密封，正压搾水功能虽然可以显著将馱水挤出，缩短后处理时间，但含水率则难以保证。

Generally, the residual water content in beams after pressurized dehydration can guarantee a 90% pickup rate. The efficiency of the process depends on the winding density and tension of the beams or packages. However, there are uncertainty to prevent leakage between packages. Although pressurized dehydration helps reducing the drying time of packages, there is no guarantee on its water content.

高温直接排放

HIGH TEMPERATURE DRAIN

可缩短染色工艺加工时间约30分钟和节省冷却水能源。在用分散染料染含聚酯纤维(涤纶)的筒子纱时，由于在外染聚酯纤维的过程中会产生二聚体、三聚体等低聚物，而这些低聚物也和聚酯纤维一样吸收染料。这样，在常温情况下排放，这些副产品游离于染液中，排放时便贴附在纱的表面造成色牢度差，同时还贴附缸壁上，严重的需洗缸，不然会影响下一缸染不同颜色时的沾色。

It can reduce the dyeing time at least 30 minutes and save the cooling water. In polyester package dyeing with disperse dye-stuff, since there is some oligomer, such as dipolymer, tripolymer formed in the process of manufacturing which also absorbs dyestuff. Thus, some of them may stick on the yarn surface or machine inner surface during normal drain, the result not only causing poor color fastness, but also color stain defect when loading next batch of different shade without machine cleaning.

注意 Note

需配合厂内排放端设有合乎技术要求之高温储水池。厂内排水管路设计亦影响馱压排水效果。我司乐意给与专业意见。

It requires qualified high temperature drain reservoir at the discharge. The design of drainage pipe network also affects the drainage result. It is our pleasure to provide professional advice.

技术数据 Technical Data

1. 设计温度	Design temp.	140°C
2. 设计压力	Design pressure	4.4bar
3. 升温率	Heating gradient	25°C ~ 100°C 平均 approx. 4.5°C/min 100°C ~ 130°C 平均 approx. 2.5°C/min (以7bar干燥饱和蒸汽压力计, dry saturated steam pressure at 7bar)
4. 降温率	Cooling gradient	130°C ~ 100°C 平均 approx. 3°C/min 100°C ~ 80°C 平均 approx. 2°C/min (以25°C 3bar冷却水压力计, cooling water at 3bar, 25°C)

快思逻辑温控技术

FUZZY LOGIC TEMPERATURE CONTROL TECHNOLOGY



在染色过程中的温度控制对处染后成品的质素有著重要的影响。快思逻辑温控技术实时监测外在环境的物理状况并持续微调温控参数，减少温度误差及保持温度稳定性，能有效减少阴阳色及达至匀染效果，是一项保证匀染的重要技术。此技术亦在2003年荣获「香港工业—科技成就奖」，可见其在业界拥有领先技术。此控制技术甚至能够适应外在物理环境的变化，保证在不同机械状态下仍能提供最好的温控效果，减低维护成本。

实验数据比较

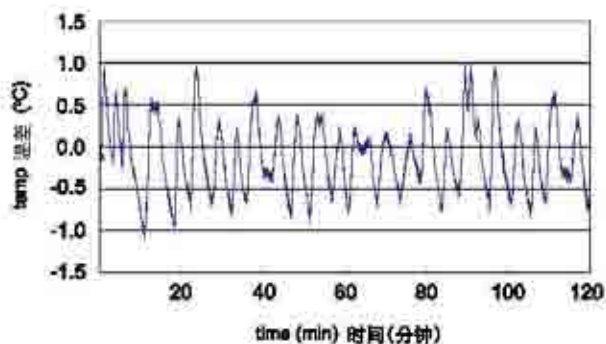
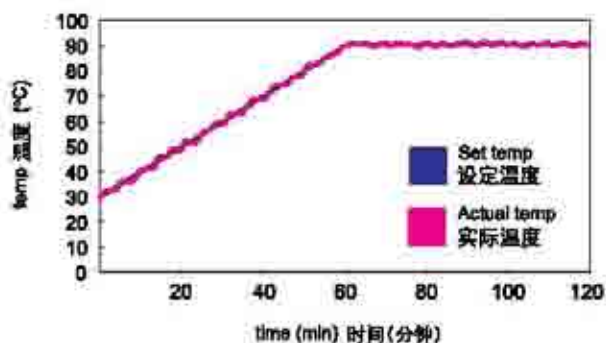
由实验数据可见，与传统PI温控技术比较，快思逻辑温控技术能够有效提高温度控制的准确程度，保持温度稳定性。温度上升率甚至可微调至每分钟0.3℃。从数据可见实际温度及升温曲线与设定的控制升温曲线可说是差不多完全一致。

Temperature control is a critical factor that contributes to the quality of dyeing. Having realized the defects using conventional "PI" control method, FONG'S developed an innovative Fuzzy Logic temperature control method. The Fuzzy Logic technology monitors the ambient physical factors continuously in real time and finetune the control parameters accordingly, to stabilize the temperature and reduce its error. This leading technology has won The Hong Kong Industrial Award in 2003. This control can even adapt to the changes from surrounding to ensure optimum control under different conditions, hence saving the maintenance cost.

Experimental Data

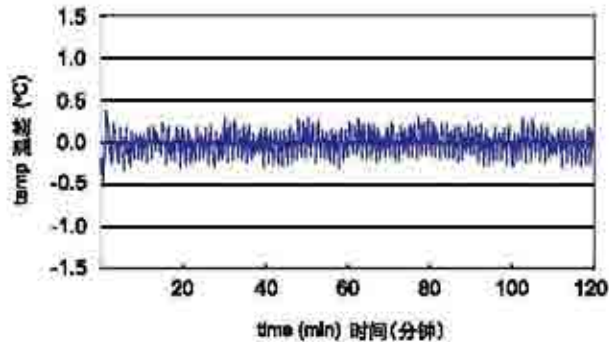
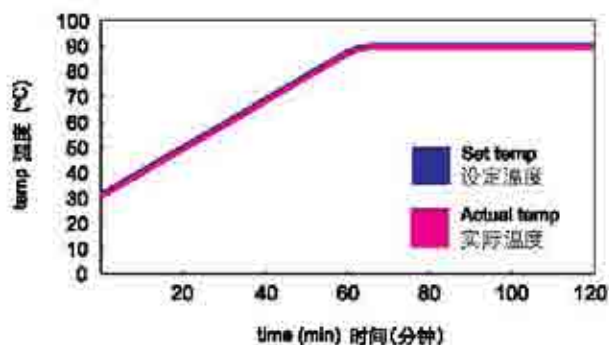
As shown from experimental data, the Fuzzy Logic temperature control technology can effectively improve the accuracy of control, comparing with the conventional PI method and maintain its stability. The actual temperature as well as the heating curve are almost the same to the control curve, as seen from the data.

传统PI控制 Conventional PI Control



结果:温差 $\pm 1.0^{\circ}\text{C}$
Result: Temp $\pm 1.0^{\circ}\text{C}$

快思逻辑控制 Fuzzy Control



结果:温差 $\pm 0.3^{\circ}\text{C}$
Result: Temp $\pm 0.3^{\circ}\text{C}$

"由误差数据可见，与传统PI温控技术比较，快思逻辑温控技术所造出的误差范围相当小，只有正负约 0.3°C 。"

"THE ERROR USING THE FUZZY LOGIC TEMPERATURE CONTROL TECHNOLOGY IS APPARENTLY SMALLER COMPARING TO THE CONVENTIONAL PI CONTROL, RANGING WITHIN $\pm 0.3^{\circ}\text{C}$ AS OBSERVED IN THE ERROR CHART."

FC30 程序控制器

FC30 PROGRAM CONTROLLER

新一代FC30程序控制器，配备6.5寸、640x480像素、TFT彩色液晶显示屏。配合新颖控制功能，提供了最具经济效益的控制方法。FC30并可与我们开发的中央电脑系统VIEWTEX或THEN-TDS联结起来，实配对整个染色车间的全面电脑化管理和控制。

The new generation of FC30 program controller has a 6.5-inch 640x480-pixel, TFT color LCD display together with novel control functions, providing the most cost-effective control. FC30 can also integrate with our VIEWTEX and THEN-TDS central computer system, providing comprehensive control management.



流程图 Schematic Diagram



流程图画面，能更清晰地观察批次的重要运行参数。

The Schematic diagram clearly shows most of the important running parameters of each batch in single display.

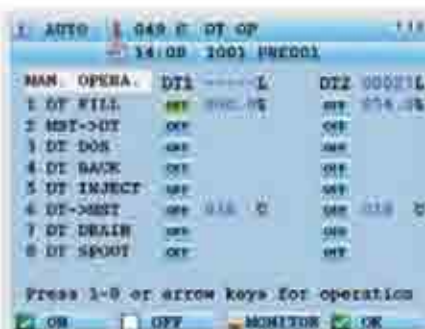
工艺曲线图 Processing Curves



同时记录最多8条参数曲线，并预设4个画面，可供用户自行组合所需的工艺曲线图。

FC30 program controller can store up to 8 different processing curves. User can also pick 4 sets of processing curves with their own combinations.

面板手动操作功能 Manual Control Buttons on UI



在操作面板上,标配了主缸·料桶及MST手动操作按键功能,方便工厂实现集中管理。

Manual Control Button for Main Tank, Dosing Tank and MST on the User Interface of FC30 as standard, better control under Central Management System.

自动领航功能 Navigation Function



自动将运行参数导入，自动生成所需的工艺程序，亦可自行创建不同批号（纱品种）的运行参数，从而建立用户独有的数据库，简化操作流程之余，亦可减少人为错误。

User can save their recipes for an unique database to simplify the operation and prevent human error.

强大水比计算及扣水功能 Powerful Liquor Ratio Calculation and Liquor Deduction Function

Item	Amount	Unit
01 TOTAL WEIGHT	00000	KG
02 HEATH LR	000.0	
03 DYEING LR	003.0	
04 FINISH LR	000.0	
05 NET LR	003.0	
06 MST DRY LR	003.0	
07 MAX SEAM CYCLE T	00100	S
08	00000	
09	00000	
10 RINSE FLOW	00400	L/MIN

在编写主缸计量入水及MST入水功能时,可选择多个水比计算值,以便实现全程按预定水比行机,此功能极大方便了编程及提高染色程序的通用性。

User can define a multiple of liquor ratio calculation method, this enables a completely automated system with accurate control of liquor ratio at any step throughout the cycle, provides convenience and repeatability on dyeing process programming.

能耗报告 Utility Consumption Report

Consumption Item	Amount	Unit Cost	Total Cost
Water	28.460M ³	\$0.7800	\$ 22.2048
Electric	0.00124KWH	\$01.00	\$ 0.0124
Steam	0.1246KG	\$85.00	\$ 10.5961
			\$02.8124
			\$02.8124

标配提供估计的能耗统计报表，包括：水、电、蒸汽的用量及成本报告。机器选配了水、电、蒸气用量仪表，可提供真实的能耗统计报表。

Estimated utility consumption report of water, electricity and steam of each batch is provided. Actual consumption values can be shown if the machine equips with metering devices of water, electricity and steam.

快速卸载纱架

PACKAGE UNLOADING BASKET

快速卸载纱架

筒子纱于染色后出缸时免不了要将筒子纱从纱架上卸下来，再装上到其他后处理的设备上进行处理。但要将筒子纱一个一个的由操作工从纱架卸下其实亦都颇费时间。

我们独创的快速卸纱系统，使大载量纱缸的卸纱工序更快速容易，减轻工人劳动强度。快速卸载装置在染色前预载于纱架，染色后只需将快速卸纱装置吊起，处染后纱架里所有的筒子纱便可与纱架彻底分离，待透过工作门回收作下一工序。快速卸纱系统能为客户节省装卸时间，有助提高产量。

Package Unloading Basket

It is inevitably for unloading the packages from the package carrier after a dyeing process, and load them onto another device for other further processes. However, it is very time consuming for the operator to unload the package one by one from the package carrier.

The unique Fong's package unloading basket simplifies the working steps for unloading packages from large loading carriers and reduces manual effort. The package unloading basket is placed on the package carrier before loading package for dyeing. It is lifted up directly with crane after the carrier is unloaded from vessel after dyeing. The packages are then separated from the carrier completely. They are collected via the service door on the basket thereafter. The package unloading basket helps operator by reducing the time for unloading packages thus increase productivity.

1

染后待卸的纱架
Carrier Loaded with Package



2

用吊机将卸纱框吊起
Unloading Basket is Hoisted Halfway



3

卸纱框与纱架完全分离
Unloading Basket is Completely Removed from Carrier



4

打开卸纱框工作门，取出筒子纱
Packages are Ready to be Removed via the Access Door



底部防漏纱竹

BOTTOM LEAK-PROOF SPINDLE

底部防漏纱竹

纱竹设计虽然简单，但细微之处足以使染色质量分出高低。底部防漏纱竹配有密封胶环，配合立信独有设计底碟之形状，将放于纱竹最底部的筒子纱纱筒、底碟、以及纱竹紧紧相连，滴水不漏。染液可集中穿透筒子纱，令每根纱线均匀与染液接触，达到高质素的染色效果。

Bottom leak-proof spindle

Spindle designs are simple, yet slight changes may cause defects in dyeing result. There is a sealing ring installed on the bottom leak-proof spindles. Matching with the Fong's special bottom plate, the surfaces between spindle, bottom plate and the package are sealed and leak-proof. The dye liquor is forced to pass through every package to achieve high quality dyeing result.



无泄漏快速顶锁

LEAK-PROOF FASTENER

无泄漏快速顶锁

除纱竹底部受到防漏保护，纱竹顶部安装专利设计之无泄漏快速顶锁。顶锁独特设计，于载纱后自动收紧密封，加上带铁佛龙密封的顶碟，防止染液从纱竹顶的螺杆漏出。与此同时，安装顶锁快捷方便，设计单向往下快速锁紧筒子纱避免水流将其往上冲起，无需按螺纹旋转，省时省力。卸载筒子纱时，只需将卸除把手往上一推，顶锁随即可直接往上拔出，操作方便，令生产更有效率。

Leak-proof fastener

Beside the leak-proof design at the bottom, the patented fastener also prevent leaking at the top. The fastener interlock with the spindle when loading with force against the package. The top plate with Teflon sealing can also avoid leakage from the spindle. Besides, the operation is simple that the fastener will slide only downward while locked against upward thrust of liquor flow. It can be unlocked effortlessly by releasing the handle upwards to allow faster operation.



试验对比

PERFORMANCE COMPARISON

SUPERWIN单向外流染色与传统的双流向染色相比, 可以让用户在耗水、电、蒸汽、助剂和工时等做到全方位节省, 让用户以最好的设备占尽生产成本的优势。

Compared to conventional dual flow dyeing, SUPERWIN Single Inside-out Flow dyeing machine achieves versatile saving by optimising water consumption, electricity, steam, chemicals and time, which is the best dyeing equipment with low production cost making our customers in dominant position.



项目 ITEM	耗用量 CONSUMPTION		
水 WATER 	传统 Conventional		100%
	深色 Deep Shade		省 SAVING 36.98%
	中色 Medium Shade		省 SAVING 57.30%
	浅色 Light Shade		省 SAVING 60.02%
蒸汽 STEAM 	传统 Conventional		100%
	深色 Deep Shade		省 SAVING 67.83%
	中色 Medium Shade		省 SAVING 78.61%
	浅色 Light Shade		省 SAVING 77.81%
电 ELECTRICITY 	传统 Conventional		100%
	深色 Deep Shade		省 SAVING 44.05%
	中色 Medium Shade		省 SAVING 60.60%
	浅色 Light Shade		省 SAVING 60.00%
助剂 CHEMICALS 	传统 Conventional		100%
	深色 Deep Shade		省 SAVING 25.72%
	中色 Medium Shade		省 SAVING 54.37%
	浅色 Light Shade		省 SAVING 63.08%

上述试验对比数据因工艺、材料、水质以及操作方法不同而有所差异, 仅供参考。

The above test comparative data could have variance due to difference in dyeing techniques, materials, water quality and operation methods and are for reference only.

案例参考

CASE STUDY

经过多次的染色试验后，我们将其中一个处染浅色筒子纱的案例在下列展示，当中有提及用水、用电及用蒸汽的平均耗用数据。

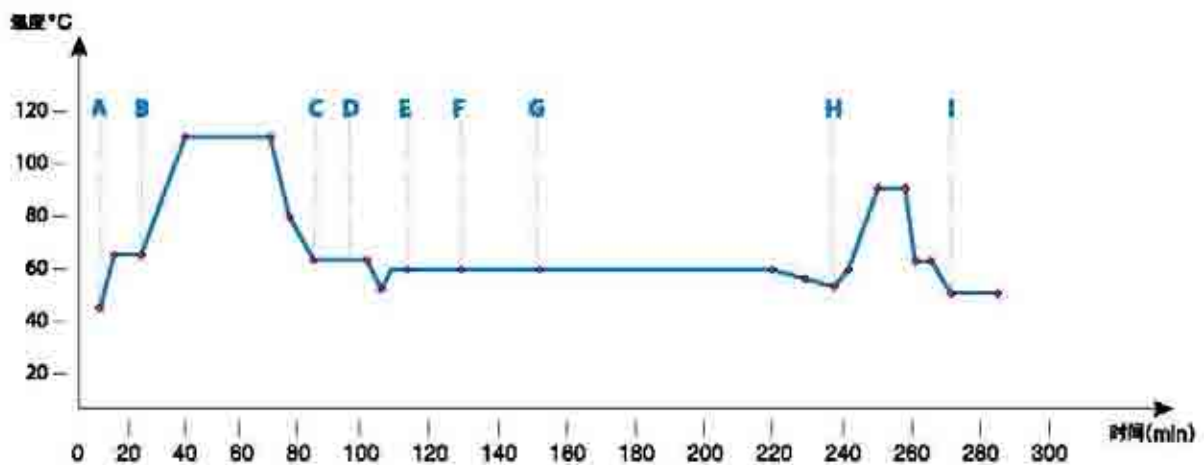
We are showing the consumption of water, electricity, steam, chemicals and time extracted from one of the numerous trials conducted.

工艺条件 Program Conditions	
纱支 Yarn counts	32S/2
物料 Material	100% 棉 Cotton
颜色 Color	米红 Belge red
总重量 Total weight	477.2 kg
筒子内径 Inside diameter of package	64 mm
筒子外径 Outside diameter of package	158 mm
筒子高度 Height of package	154/150 mm
筒子密度 Density of package	394 g/dm ³

助剂 Chemicals		
A	精炼剂 AW 50	3.0 g/L
	精炼剂 DXA-160	2.0 g/L
	螯合剂 GL-402	1.0 g/L
	NaOH (30%)	4.0 g/L
B	H ₂ O ₂ (35%)	5.5 g/L
C	HAc (98%)	1.2 g/L
D	除氧酶 GC-50L	0.2 g/L
E	HAc (98%)	0.18 g/L
	分散剂 HIS	0.5 g/L
F	Ha ₂ SO ₄	14 g/L
G	Na ₂ CO ₃	5 g/L
H	HAc (98%)	1.5 g/L
I	HAc (98%)	0.5 g/L
	柔软剂 AWG	3 %

耗能 Energy Consumption	
用水 Water	10915 L
用蒸气 Steam	557 kg
用电 Electricity	76 kWh
时间 Time	285 min

染色工艺 Package Dyeing Process



每公斤纱平均耗能 Consumption per kilogram of package

耗水平均值:
Average value of Water
22.87 L

耗蒸汽平均值:
Average value of Steam
1.167 kg

耗电平均值:
Average value of Electricity
0.159 kWh

其他产品介绍

OTHER MACHINERY

MINIWIN

小样纱线单向外流染色机

Laboratory Package Single Flow Dyeing Machine



专为处染一个标准筒子纱而设的小样单向外流染色机，配合独有浪涛染色技术，在模拟大批量染色上，能达到至相近的染色效果。

MINIWIN is a laboratory package single inside-out flow dyeing machine specialized for dyeing one package. With unique wave dyeing technology, the dyeing effectiveness is consistent with the large production package dyeing machine.

特点 Features

- 单向外流染色
- 独有浪涛染色技术
- 低浴比染色
- 适合实验室使用
- 小巧轻型
- 配有定量注料筒
- Single inside-out Flow
- Unique Wave Dyeing Technology
- Low Liquor Ratio
- Compatible for Laboratories
- Small Size
- With dosing tank

MICROWIN

小样纱线染色机

Mini Sample Yarn Dyeing Machine



能处染更小型的筒子纱样板，进一步节省昂贵纱线原料、染料、助剂及能源。设计更适合于实验室环境使用，为高素质染色车间良伴。

MICROWIN can be used to dye small packages, saving expensive yarn materials, dyestuff, chemical and energy cost. It is suitable for laboratory use and is a good companion in high quality dyeing workplace.

特点 Features

- 超低浴比
- 双向染色
- 适合实验室使用
- 小巧轻型
- 取样方便
- 节能环保
- Ultra-low Liquor Ratio
- Dual Flow Dyeing
- Compatible for Laboratories
- Compact and Light-weight
- Easy dye liquor sample collection
- Eco-Friendly

LABWIN

筒子纱小样染色机 Laboratory Package Dyeing Machine



专为处染1个至6个标准筒子纱而设的小样染色机。在模拟大批量染色上，能达至相近的染色效果，可作为小批量的筒子染色加工使用。

LABWIN is designed for dyeing 1-6 standard packages. Apart from high-quality sampling, it can also be used as small batch dyeing.

特点 Features

- 重现性高
- 双向染色
- 多款型号
- 灵活载量
- 联机功能
- 工艺直用
- High Reproducibility
- Dual directional dyeing
- Wide range of machine models
- Versatility in capacity
- Coupling functions
- Direct Process Application

FTDW

射频烘干机 Radio Frequency Dryer



以射频技术对纺织品烘干是相对较新的烘干技术，具有低温烘乾，湿度均匀等优点，不但能对高密度筒子纱进行烘乾，更能有效保持纤维质量和柔软性。

The use of Radio Frequency (RF) in the drying of textile material is an innovative technology. Its advantages include low temperature drying and uniform humidity. The technology can be used in drying high density packages. It is also effective to maintain fibre quality and softness.

特点 Features

- 应用广泛
- 烘乾效果优异
- 低温烘乾
- 节能省时
- 先进控制功能
- 两款型号配合不同需要
- Wide Range of Applications
- Excellent Drying Results
- Low Temperature Drying
- Energy Saving
- Advanced Control Functions
- Two Models to Meet Production Requirements

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FONG'S National Engineering offers world-class aftersales support including installation, commissioning and maintenance.

The service is provided around the globe, with a team of over 100 qualified professional service engineers in China, as well as its own engineers stationed throughout Americas, Europe and other Asian countries. The set-up of fong's technical services private limited in New Delhi, India with branch offices in Mumbai and Tirupur also provide full range technical services to our customers in india and neighbouring countries. FONG'S National is committed to cater customer enquiries within 24 hours. Customers' needs are valued for continual improvement. Every task will be completed on schedule according to the contract.



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SUPERWIN

High Temperature Single Flow Package Dyeing Machine

高温筒子纱单向外流染色机

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