

Higher Automation Cuts Human Error

Charlotte Rogers examines some of the latest developments in equipment for recipe preparation

AS MARGINS get tighter and the pressure for quick turnaround is heightened, there is an increasing demand within the textile industry for dye preparation that is both fast and accurate. Dyers are also in search of high levels of reproducibility, both for sample dyeing and the industrial production of apparel.

In response to this need, recent innovations in colour-kitchen equipment have explored the potential for automation, particularly as a way of eliminating human error. Manufacturers have also developed streamlined processes intended to cut installation time, reduce the cost of labour and offer a more convenient experience for the user. Here we take a look at some of the latest advances.

Redesign

Fong's Industries Group has recently redesigned its chemical-dispensing system (CHD) to provide the fast and accurate delivery of small to large amounts of chemicals to every target in the system. This is intended to eliminate human error and reduce labour costs.

According to Fong's, this accurate targeting means no waste is produced, cutting chemical costs by up to 20%. This in turn reduces the risk of chemical spills both to the environment and the machine's operators.

To ensure best reproducibility, the system features automatic dosing and dispensing from batch to batch. This is maintained by a fast high-end extrusion pump, combined with compressed air transportation. As the piping is not filled with water, a low liquor ratio and low rinse water consumption can be achieved.

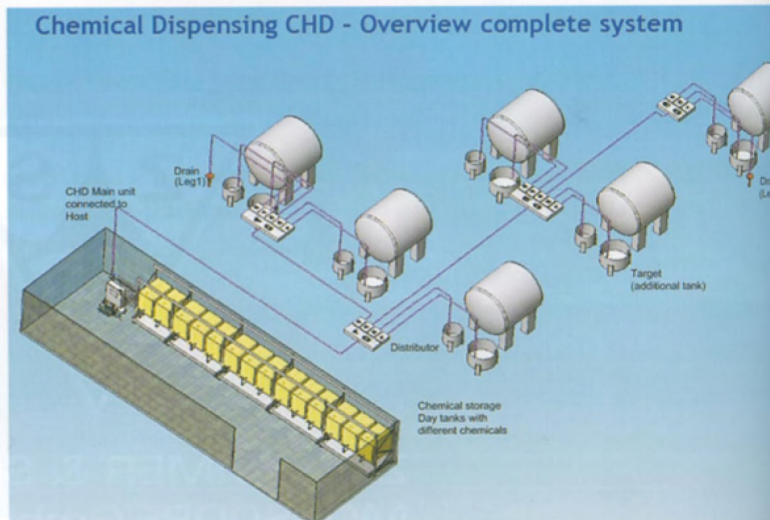
According to Fong's, the heart of the CHD is the Coriolis flow meter, which operates at an accuracy of $\pm 0.3\%$, favourable when compared with a magnetic inductive flow meter with a typical accuracy of 1%. The measuring principle is independent of the physical fluid properties, such as conductivity, pressure, temperature and density. As a result there is said to be no distortion during product change.

Detection is much faster when using the CHD than with the magnetic inductive measuring principle, said Fong's, as even air pockets inside a product can be detected. Used in the pharmaceutical industry, the CHD sensors are designed for easy rinsing and do not contain moving parts, resulting in reduced maintenance costs.

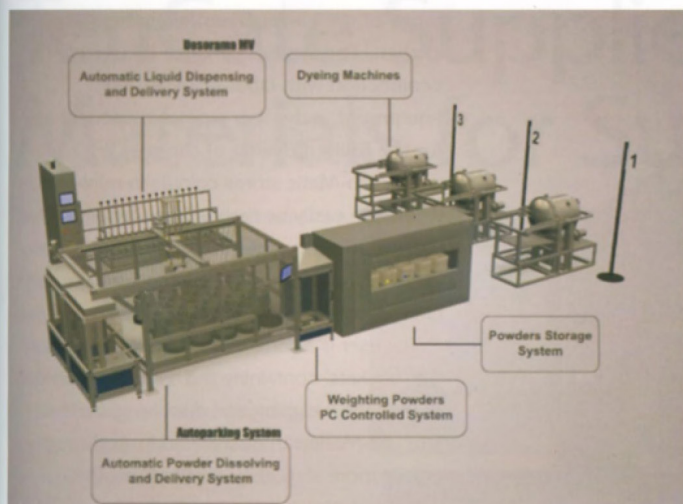
The CHD is available for 14 or 28 products per line, although up to 20 targets per line are recommended for



Fong's CHD main unit



Schematic of the Fong's CHD



Tecnorama's Autoparking system



Cimatak dispensing system

best performance. Chemicals and liquid dyestuffs are dosed in quantities from 50ml to several 100 litres. Multiple lines can be operated parallel.

Fong's Colour Kitchen Manager (CKM) is based on the same distribution system used for the fully automatic metering and transport of chemicals from day tanks to dyeing machines. The CKM, designed as a modular system, coordinates the weighing, dissolving, storing, transporting and dispensing of liquids, powdery auxiliaries, dyestuffs and auxiliaries. According to Fong's, this means consumption is optimised and controlled.

The main unit is operated by a touch-panel computer with no moving parts and a soft PLC, which provides detailed information and diagnostics. It is possible to operate the host system from a central control, communicating via standard interfaces, which are independent from the hardware and operating system. According to Fong's, this ensures best repeatability and documentation of all dispenses.

The CHD is designed as a compact system to be installed wherever best in the dye house.

Automatic Management

To manage the colour-kitchen process, Tecnorama, an Italian manufacturer of machinery for the dispersing of liquid and solid dyestuffs, has developed Autoparking. An automatic system designed to manage buckets containing the recipes for dispensing to dyeing machines, Autoparking automatically dispenses dyes in powder or granule form.

The system is a combination of an electronically controlled check-weighing bench and a parking-station where a number of buckets are stocked, from which the dyes are dispensed. The system also includes up to two units for the dissolution and automatic transfer of

recipes, which are then weighed directly into the dyeing machines.

The system has been designed to combat the problems encountered when automatic dye-dispensing systems are used in areas with a high humidity rate. These conditions often reduce reliability because the feeding of the powder dye can fail to flow regularly or stop altogether.

When included in the integrated automation of a dye-house, this system is reliable, efficient and very economical, said Tecnorama.

The Autoparking system has a bucket capacity of: ALS-6, 6 litres; ALP-30, 30 litres; or ALS-80, 80 litres. The machine is also available in a number of positions: ALS-6, 20, 60 or 20; ALP-30, 42 or 60; ALS-80, 42 or 60.

Tecnorama's Autoparking has a manual check-weighing system, manual dispensing system, a weighing accuracy of 0.1g, with an optional second scale providing accuracy of 0.001g, and a minimum dispensing of 0.001g.

Rapid Installation

Cimatak, an Australian manufacturer of industrial volumetric and gravimetric measuring methods, has developed a new self-contained liquid chemical dispenser with simplified installation.

Cimatak's CG10 system includes pumps, scales accurate to 10g, an industrial PC, solenoids valves and angle seat valves enclosed in a stainless steel cabinet. The CG10 has the capacity to dispense six chemicals.

According to the manufacturer, the intention of the simplified CG10 system is to offer a lower initial price to customers. The new system retains many of the key features of Cimatak's CG100 gravimetric dispenser, including its dosing technology, combined with upgraded software and a careful

component selection.

The CG10 has a turnkey system, meaning the user can plug in the electrical cord, connect the compressed air and start the operation immediately. With this machine there is no need to run pipes along the chemical room and mount pumps on the wall, said Cimatak.

Installation time is therefore said to be reduced from four to five days to a few hours. This simplified process has been designed to give the user with the flexibility to place the dispenser where the chemicals are to be used.

As many of the company's customers, particularly in China, do not have recipe-management systems, the dispenser is intended to be as easy to use as a petrol pump, said Cimatak.

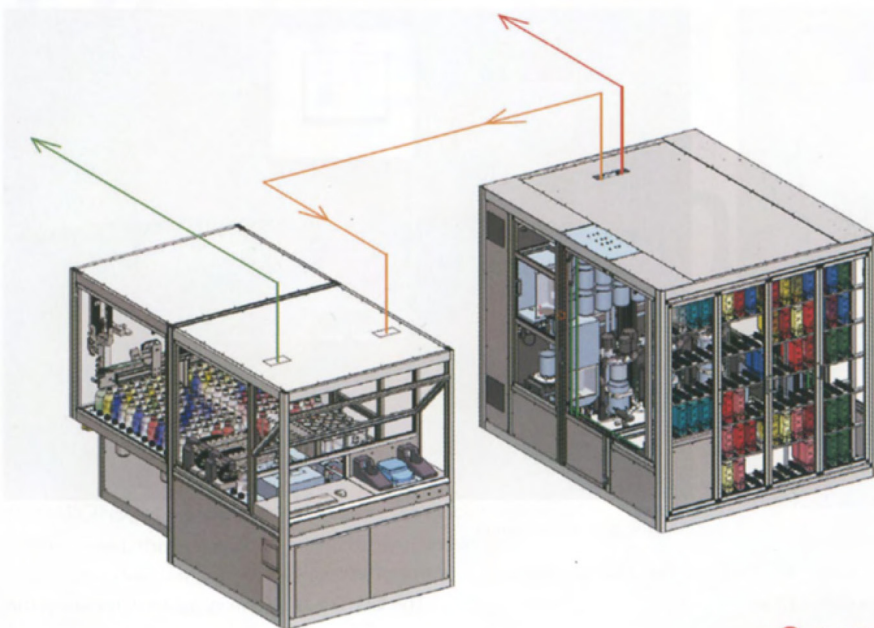
To operate the CG10, the user selects the chemical drum from a touch screen, keys in the amount, presses 'go' and the cycle commences. The container is put under the dispense head as the system waits for the chemical to be delivered. The system records the chemicals used to aid monitoring.

Cimatak describes the CG10 technology as a dramatic improvement over the traditional method of scooping chemicals out of the drum. Its system is said to ensure the chemicals are correctly weighed for the convenience of the operator.

Cimatak has also released the CG100, which incorporates recipe-management integration, receipt printing, ticket scanning and scales accurate at 5g.

Eliminating Error

Italy's Lawer has developed a colour-kitchen system for the automatic weighing and dissolving of small to very small amounts of powder dyes. The Lab-Matic system has been developed to eliminate the errors related to



Lawer's Lab-Matic

timing and environmental safety, associated with manual systems.

The automatic Lab-Matic is intended for

the dyeing of small batches and samples, as well as the industrial production of apparel. This technology will fulfil the dispensing



range of the Lawer Dyematic industrial colour kitchen. The system can also be used in conjunction with laboratory testing equipment, a dye-lab pipette dispenser and for the Foulard dyeing of samples.

The Lab-Matic stores colours in mini-silos, which can easily be manually loaded into a storage area. According to Lawer, the system can weigh one or more powder dyes to a very high accuracy.

The user is able to automatically manipulate the 'buckets' containing the dyestuffs, in order to feed the weighing and dissolving stations. The Lab-Matic can dissolve and mix through one or more stations, as well as mix the powder-dye recipes within the buckets, according to specific parameters set for time, temperature and dilution in water, said Lawer.

The system automatically sends the dissolved dyes to the sample and production dyeing machines with limited quantities of waters in line with the liquor batch ratio. The Lab-Matic can prepare and transfer standard solutions of liquid dye solutions to feed the Lawer TD-Lab pipette dispenser. ID

Benninger Ready for New Carbon Footprint Regulations

• Continued from page 18

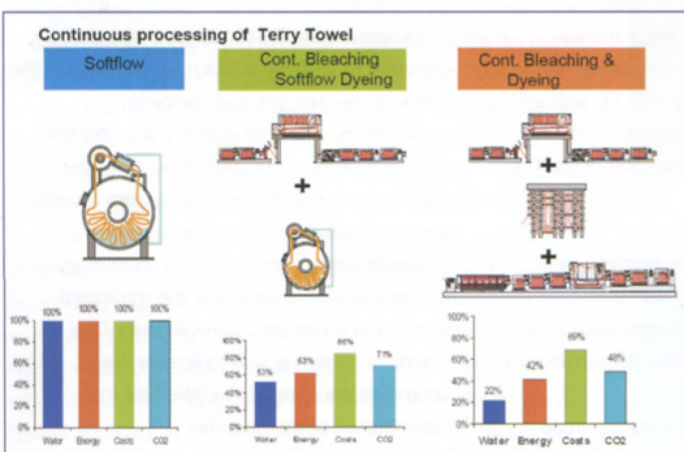


Fig. 7: Carbon Emission of conventional and continuous finishing of knitwear

are now profiting not only from the low consumption figures, but can also report with pride that CO₂ emissions have been reduced by more than 50%.

* Zero-discharge textile operations

The Kyoto Protocol sets out binding targets and time frames for emissions of greenhouse gases. The textile industry can

also do its bit. Detailed and accurate analysis of the consumers is followed by optimisation of water and energy consumption. The continuous dyeing and finishing processes for textiles will help here, and it will be necessary to replace exhaust dyeing processes.

Not only does Benninger have the necessary expertise to calculate carbon and

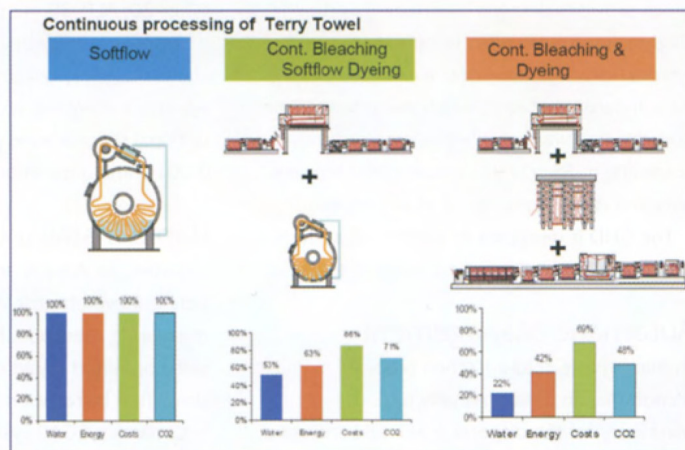


Fig. 8: Energy and water savings with continuous finishing of terry towelling

water footprints for different finishing techniques and processes, but it also offers machines which are particularly efficient in their use of water and energy. One particular highlight is the recycling of water and energy from Benninger plants, with the aid of which it is now possible to refine textile systems to the stage where the discharge of waste water is reduced to zero. ID