From Lab to Bulk

John Scrimshaw surveys the range of small-scale machinery available to today's dyers

LAB-TO-BULK reproducibility is among the key objectives of laboratory dyeing equipment used in the industrial domain – and these days that requirement must be matched by the kind of high-tech features increasingly seen in the production dyehouse.

Tecnorama references Industry 4.0 – the drive towards automation and the so-called 'Industrial Internet of Things' (IIoT) – in describing its new Dos&Dye Compact, which it says has contributed to the establishment of interconnected dyeing processes.

The company says it has always been alert to the issues of sustainability, quality and productivity in the sphere of industrial production and has spent a great deal of time, energy and resources in R&D, with work particularly focused on fully automating the dyeing laboratory. It describes laboratory precision as "universally considered to be critical for achieving optimal results in industrial production."

The Dos&Dye Compact integrates a Dosorama dispensing machine with several models of dyeing machine, all components being fully automatic and robotic. As a result, says Tecnorama, it is possible to optimise a number of production processes, ensuring the reliability and repeatability of results obtained in the laboratory and their transfer to the production plant.

"All types of manual and process errors are avoided with the completely automated Dos&Dye Compact system, and with the aid of traceability systems all the steps of jobs done by single work units can be monitored at all times and/or studied at a later date, ensuring optimal performance levels over time," the company claims.

Advanced information technologies are used to fully manage and monitor the data from all laboratory activities and to transfer data, including by remote means, allowing global interconnections among the various systems and, according to Tecnorama, significantly improving the quality, sustainability and productivity of associated industrial processes.

The Technorama Dos&Dye

It claims the results are also clearly positive in the areas of ecology (less consumption of water and energy), safety (no manual intervention or contact with products or dyestuffs) and economics (greater productivity and less need for corrections/re-dyeing).

Characteristics of the dispensing machine, part of the Dos&Dye Compact system include:

- automatic preparation of solutions, using powder-based products or dyestuffs as well as liquid products
- automatic washing of used bottles and pipettes and their immediate re-use
- automatic substitution of expired and/or exhausted solutions, replacing them with new solutions that are automatically re-prepared when necessary
- a system for the automatic dispensing of solutions in the various dyeing units, when requested, according to predetermined quantities and timeframes
- a system for the automatic loading of the various samples to be dyed in the dyeing units present in the Dos&Dye Compact system.
- a system for the automatic unloading of samples already dyed in the various dyeing units, re-positioning them in the storage area positioned along the side of the dyeing machines
- operating software both for the system and for single machines

Characteristics of the dyeing units, part of the Dos&Dye Compact system include:

- A lid opening/closing system for single autoclaves
- liquor circulation that can be controlled automatically in terms of speed and direction of circulation
- automatic discharge of liquor
- automatic heating and cooling, and automatic monitoring of temperature gradient
- automatic input and measuring of the quantity of water in single autoclaves, using flow meters
- software for the management of dyeing processes and operating software for the job programmes of single dyeing units.

Smallest Ever Tonello

Tonello's G1 Lab is another highly compact dyeing machine designed to faithfully simulate real production processes, in order to test and perfect recipes and processes before implementing them on a large scale.

G1 Lab is the smallest ever machine from Tonello. As its name suggests, it is designed for the lab, but, says the company, this does not prevent it from reproducing the exact results of production machines.

It works in exactly the same way as bulk machines, with the same liquor ratio, programming and recipes, and can also be managed remotely using MAG2D. Tonello's

remote assistance system.

Advantages claimed for the G1 Lab include:

- minimum load: 50g (requiring no ballast garments to be thrown away at the end of the cycle)
- maximum load: 10kg, so even a complete pair of trousers can be dyed
- the machine maintains the same minimal liquor ratio with any type of load, just like production machines
- uses the same programs as production machines
- recipes easily transferred to production machines, and vice versa
- electrical heating in place of steam (so the machine can easily be placed next to waterand electricity outlets)
- G1 Lab is stackable and can be placed anywhere – even on a normal table
- remote recipe management, using the MAG2D remote assistance service.

Lab Trio from Thies

Germany's Thies offers a trio of machines to help take samples from lab to bulk while retaining consistent results. The LabMaster is a 1kg laboratory fabric dyeing machine, designed for research and development, quality assurance and laboratory trials.

The company says a high level of reproducibility and similar liquor ratio between lab and bulk make the LabMaster is ideal for the wet processing of narrow woven and knit fabric samples made from natural and man-made fibres and blends. It operates at temperatures up to 140°C and at a minimum liquor ratio of 1:5.

An industrial PC, featuring a function range specially designed for this machine, is said to provide optimal dye-cycle control, together with menu-driven software in Windows format and a graphic display with easy to