

PREPARING THE PERFECT SCREEN

Andreas Ferndriger explains how Swiss perfectionists have honed the basic processes in screen printing

In 2017 Grünig, the Swiss company specialising in screen preparation technology, celebrated its 50th anniversary. Focusing on professional automatic screen preparation, Grünig's strategic orientation has paid off and it is now the market leader in this sector, offering a versatile and comprehensive product portfolio for all the processes involved in screen preparation.

ESSENTIAL PROCESSES

PREPARATION: Automatic frame preparation respectively cleaning

STRETCHING: Professional solutions for a high-grade mesh tension

GLUING: Automatic mesh gluing with UV gluing technology

COATING: Modular and top quality solutions for mesh coating

CtS: The systems for direct exposure are provided by Grünig's partner SignTronic

WASHING: Automatic solutions for screen cleaning after the printing process, mesh cleaning respectively de-greasing prior to the coating process

DEVELOPING: Standardised and automatic processes following direct exposure or film copy

DRYING: Clean and rapid drying of wet or coated printing screens

INDUSTRIAL PRINTING CONSIDERATIONS

For industrial screen printing processes involving all kinds of processes, sizes, shapes, applications and requirements, a few particular and crucial aspects need to be taken into account, as they make all the difference, especially where printing screens are concerned.

Using screen printing technology for printing high-quality materials such as glass, metal and film is an industrial process which imposes very high standards with regard to quality and reproducibility.

- Abrasive colours often prevent the screens from being correctly de-coated. This means that the screen frames need to be reconditioned time and again and covered with new meshes.
- First-class printing screens are indispensable in order to print subtle details with a high edge and printing sharpness.
- Particularly high-grade and smooth material surfaces do not forgive the slightest mistake. Each and every flaw in screen preparation or during the printing process will be immediately visible.

- Special printing colours are applied whose characteristics must answer the particular requirements in connection with the used direct emulsions, capillary films or PCF meshes.
- After the printing procedure, the colours must be washed out as rapidly as possible, with utmost safety and in an automated manner, to make sure that the printing screens are thoroughly cleaned before being put into interim storage (repeat printing).

Another essential market factor is the need for lower costs in spite of the considerably more stringent requirements with regard to improved printing quality. The cumbersome and time-consuming reconditioning of already used printing screens is a frequent cause of annoyance and inconvenience. The growing tendency towards smaller production runs, combined with one-job screens is another reason why the quantity of reconditioned printing screens is steadily increasing.



Figure 1: Grünig's G-PREP 370 machine offers an automatic solution to screen cleaning



Figure 2: Cleaned aluminium frame profiles before and after treatment

THE BIG CLEANING QUESTIONS

How do you remove old glue from frames without old mesh covering? And how can the frame surface be optimally prepared, while making sure that the frame profile will not be destroyed or damaged in the process? To answer this Grünig has developed the G-PREP 370 (figure1), which offers a perfect automatic solution.

ADVANTAGES OF THIS TECHNOLOGY

- Automatic frame cleaning process.
- Safe work methods thanks to a closed cleaning chamber.
- No chemical products need to be used.
- The surface of the frame profiles will be as good as new (ideally of sand-blasted aluminium).
- An optimal adherence of the mesh/glue is guaranteed.
- Several frames can be simultaneously cleaned.
- Freely selectable programming ensures a systematic processing of various frame sizes and profiles.

HOW DOES THE G-PREP 370 OPERATE?

The powerful Grünig rotation nozzle, combined with a special high-performance pump (with a maximum pressure of up to 1'800 Bar) using normal tap water moves along the frame profile. During this procedure all the old mesh and glue residues are completely removed with utmost safety and efficiency, without using any chemical products. The small amount of water flows through a mechanical filter, upon which it can be directly led into the waste water without any environmental risk.

Figure 2 shows an example of cleaned aluminium frame profiles (before/after treatment).

To be able to clean a higher number of frames obviously means that an increased number of frames need to be covered and that more meshes need to be fixed and glued. To avoid production bottlenecks, this process must be accelerated and automated.

Figure3: The G-STRETCH 275 UV BOND LED offers a maximum degree of automation and standardisation of the stretching and gluing processes.



STRETCHING AND GLUING

The recently developed G-STRETCH 275 UV BOND LED sets new standards in the automation of stretching and gluing processes.

It goes without saying that all the commonly used meshes such as polyester and stainless steel meshes as well as the pre-coated SEFAR PCF can be used.

The mesh is directly pulled in from the roll and rapidly and easily fastened in the required dimensions. Then the stretching process is started and the mesh is automatically stretched according to the previously programmed parameters, until the final value has been reached.

This solution also involves the fully automatic mesh gluing using UV glue. The frames are prepared with quick-reacting UV glue. During the next step, the UV LED exposure head moves along the screen frame in order to cure the glue. This means that the gluing process is considerably accelerated, which not only increases the output capacity but also improves the screen quality.

Another feature of this solution is the fact that the printers can also use pre-coated SEFAR PCF mesh directly from the roll. Until now, the automatic gluing of PCF meshes has been rather time-consuming and complicated.

When using the screen printing method as a printing technology, a professional implementation of the processes is indispensable. Standardisation and automation are two mandatory prerequisites in order to meet the high requirements with regard to quality increase and cost reduction. Simplification is the key! ■

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