THE RIGHT TOOL FOR THE JOB

In this article, Peter Walsh (Executive Vice-President at M&R Printing Equipment, Inc) lays out the advantages and disadvantages of four distinct garment-printing processes

Peter Walsh, Executive Vice-President at M&R Printing Equipment, Inc

Having the right tool for the job is an important aspect of meeting customer requirements. Fortunately, today's printed-apparel decorators have four garment-print embellishment options to meet these needs. Each option – screen printing, direct-to-garment printing (DTG), hybrid screen/digital printing and direct-to-film (DTF)-transfer printing – comes with its own distinct advantages and disadvantages.

SCREEN PRINTING PROS

Screen printing offers versatility, as it can be used on a wide range of fabrics. These include cotton/poly blends and 100% polyester performance garments. Durability is another bonus as screen-printed designs are generally long lasting and can withstand repeated washing and wearing.

Screen printing also allows for vibrant, opaque colours which can be applied to garments. These create bold, eye-catching designs. Additionally, screen printing's cost effectiveness rises as the quantity of items increases, making it ideal for bulk production. High print speeds of up to 800 garments/h can also be achieved. Finally, screen printing has a low cost of consumables when compared to other garment-printing technologies.

SCREEN PRINTING CONS

Firstly, high resolution and/or high colour-count designs require complex artwork separations as well as preparation of one screen for each colour in the image. This, in turn, results in high set-up costs.

Secondly, setting up screens and aligning colours can be time-consuming, especially for complex designs. This can impact production timelines due to extended set-up times.

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Thirdly, the screen-printing process requires a team of experienced and skilled staff from multiple departments to achieve consistent quality and production. This means that there is an increased demand for staff to cover all of these areas.

DTG PRINTING PLUSES

DTG printing can reproduce intricate designs and fine details accurately, making it suitable for complex artwork. It also allows for smooth colour transitions, gradients and shading, creating a wide range of design possibilities.

In addition – in comparison to screen printing – DTG printing does not require extensive setup which allows for faster production. DTG is also ideal for producing small quantities, or one-off custom designs, because there is no need for screen preparation.

DTG PRINTING MINUSES

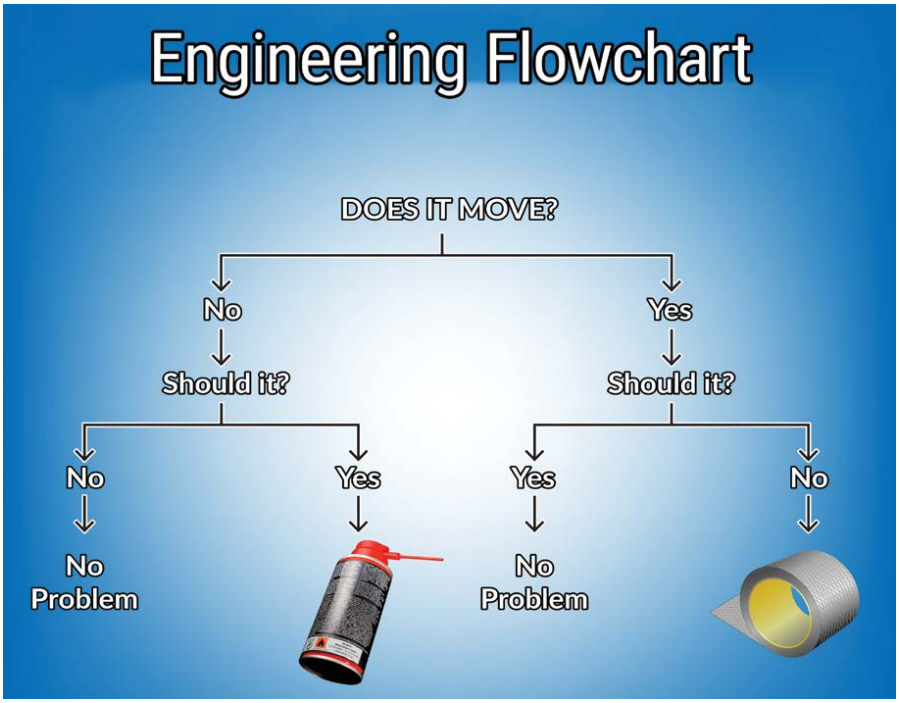
The water-based inks used in DTG printing require extended cure time at higher temperatures. This may result in less vibrant colours and limited opacity, especially on dark-coloured garments. Additionally, while DTG prints can withstand regular washing, they may not be as durable as screen-printed designs. This is particularly true over extended use and multiple wash cycles.

Another disadvantage is that DTG printing is primarily suited for 100% cotton or cotton-blend garments and is limited in its application on other materials. Moreover, production speeds attainable from DTG are generally less than 100 pieces/h. There are exceptions to this, from some industrial DTG manufacturers, including Aeoon, Kornit and M&R. Lastly, DTG inks are generally more expensive than screen-printing inks.

> *"DTG printing does not require extensive setup which allows for faster production"*

HYBRID SCREEN/DIGITAL PRINTING ASSETS

Hybrid printing often requires only three to four screens for screen printing an under-base, a screen print to digital tie coat and an overprint clear. As well as this, the high resolution and/or high colour count designs are applied digitally without the need for complex colour separations. This reduces set-up costs.



Engineering Flowchart

Hybrid printing offers versatility as it can be used on the same wide range of fabrics as traditional screen printing, providing flexibility in garment selection. Another advantage is that the combination of screen print, digital print and special-effects screen inks provide the opportunity for designers to create unique effects and textures in their artwork.

"Hybrid requires a higher level of maintenance and calibration to ensure consistent print quality"

Although not as fast as traditional screen printing, production rates of more than 400 garments/h can be attained with this process. Additionally, because pretreatment to the garment is unnecessary – and with more than 85% of the ink used being screen inks – the cost of consumables is only marginally higher than traditional screen printing and significantly lower than DTG.

HYBRID SCREEN/DIGITAL PRINTING DEFICITS

Hybrid printing involves both screen printing and digital processes, which can increase set-up time and require additional expertise. This combination can result in potentially higher production costs compared to individual methods. On top of this, hybrid requires a higher level of maintenance and calibration to ensure consistent print quality. Furthermore, hybrid-printing equipment requires an operating environment with a higher level of climate control than the average screen-printing facility.

DTF-TRANSFER PRINTING ADVANTAGES

Direct-to-film (DTF)-transfer printing can achieve intricate designs and fine details accurately, in the same way as DTG and hybrid printing. This method also offers vibrant and opaque colours – especially on dark-coloured garments – to produce visually striking designs.

Transfers created with DTF printing are generally durable, allowing them to withstand regular washing and extended use. Furthermore, DTF-transfer printing is suitable for a wide range of fabric types. The level of investment required to purchase a DTF-printing system is generally lower than screen print, hybrid or a DTG-printing system.

DTF-TRANSFER PRINTING DISADVANTAGES

DTF-transfer printing requires extra steps, such as printing the design onto a transfer film and applying it to the garment, which increases labour costs and production time. Additionally, the transfer film can affect the breathability of the fabric, which may be a concern for certain garments or applications. Another negative is that, over time and with repeated washing, DTF transfers may develop cracks or peel off, reducing the longevity of the design.

In addition, production speeds from DTF are generally less than 100 pieces/h. Some exceptions of manufacturers are previously listed. Finally, the combination of the cost of

"DTF transfers may develop cracks or peel off"

transfer film, powder adhesive and DTF inks, plus the additional expense in transferring the image onto the garment, results in a higher cost per print.

CONCLUSION

Advancements in technology and the availability of different inks, equipment and techniques, will continue to optimise the performance of these four different garment-decorating processes. Successful and cost-effective production is reliant on the right tool for the job. ■

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