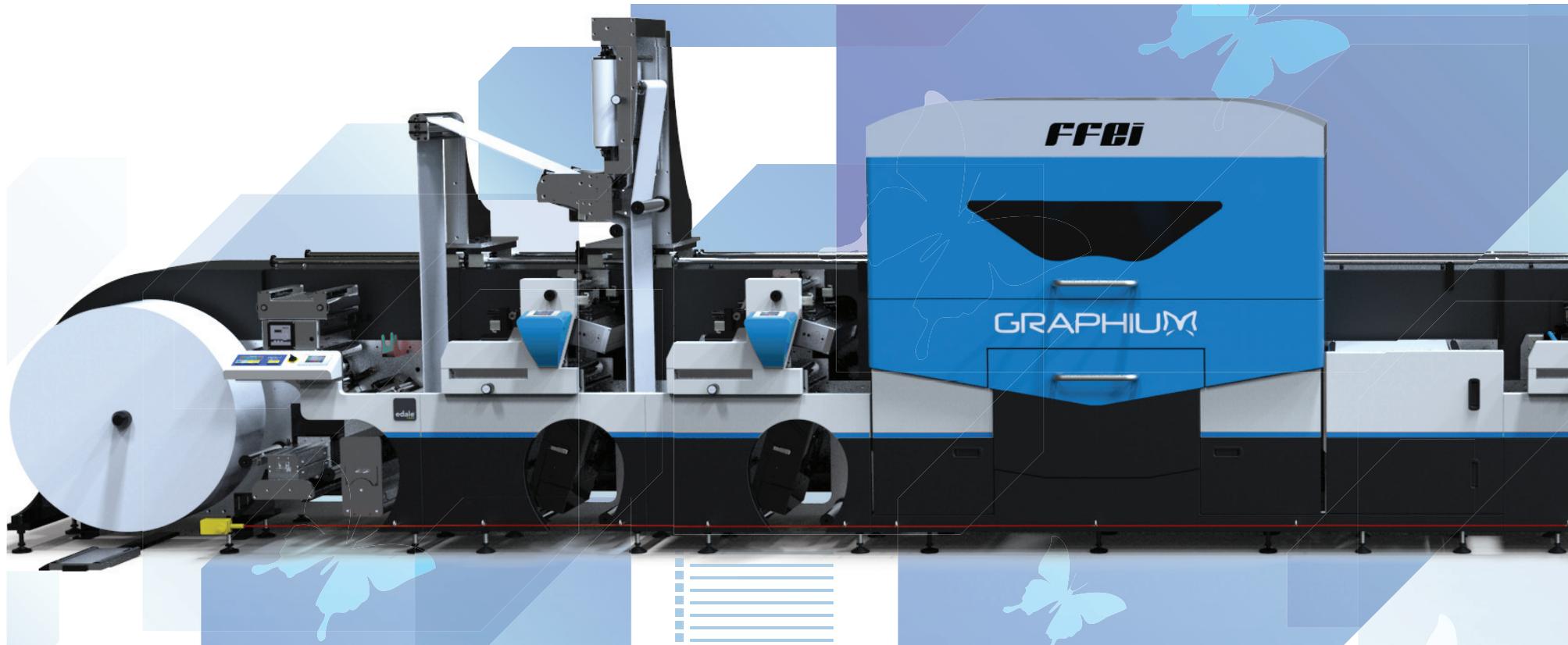


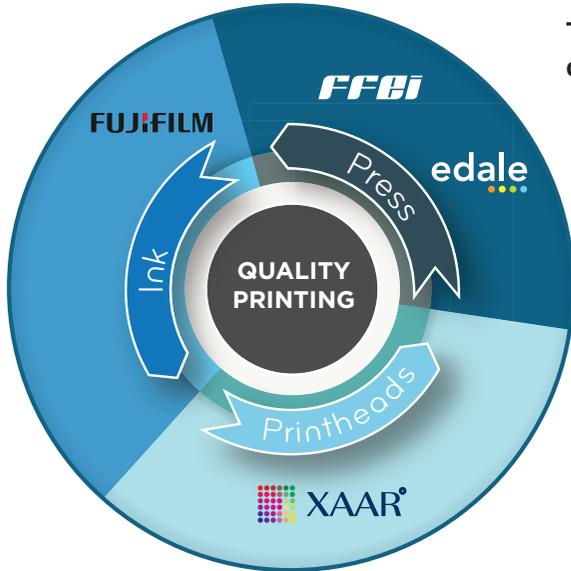
GRAPHIUM®



INCREASING THE PROFIT MARGIN
ON EVERY LABEL YOU PRODUCE

FUJIFILM
Value from Innovation

OVERVIEW



Economical digital label production for demanding applications

The label market, like many other print markets, is going through a process of change. Run lengths are decreasing, profits are being squeezed and the need for printers to differentiate has never been greater.

Graphium is a modular Hybrid UV inkjet press that provides the flexibility and productivity to print any number of complex projects requiring a wide gamut of colors on virtually any substrate. Graphium makes converting short to medium print jobs profitable, as the press streamlines workflow, requires less setup material, less ink/varnish/laminate, provides lower running waste and eliminates overruns. Furthermore, it is one of the only modular digital inkjet presses that presents the option to integrate flexo and converting stations for hybrid production and conversion in a single pass - greatly expanding the opportunities that can be converted.

Transform your business

Graphium offers a host of benefits. By improving the efficiency of short and medium run work transferred from flexo, it can turn a time consuming loss leader into a profitable business. The time that is freed up on the flexo presses can be used for more profitable long run work, so overall capacity is significantly increased. Finally, the design flexibility offered by the digital print process can create new opportunities for versioning, variable data printing and other work that is not viable with conventional print processes.

WORKFLOW

Graphium Label Workflow (GLW) reduces the pre-press and set-up time of jobs. It automates the conversion of label designs into the required digital print files and those needed to produce plates and dies. GLW is based on proven Fujifilm XMF architecture, taking advantage of the latest in APPE technology. GLW utilizes a pure PDF workflow with JDF capabilities and build in dynamic automation.

DIGITAL INK



EXCELLENT
ADHESION



LIGHT
FASTNESS



WET
RESISTANCE



DURABILITY



FLEXIBILITY

World-leading UV inkjet ink

A key factor in the growth of inkjet for wide format, packaging and industrial applications has been the ability to print with UV cured inks. This is a technology that was pioneered by Fujifilm in 1999, and one in which the company is an acknowledged world leader. Thanks to over sixty years of experience in ink design and development, the company also has expertise in designing UV inks for narrow web applications. The combination of these skills means Fujifilm is uniquely placed to develop world-leading UV cured ink for high speed digital label production.

Designing high performance UV cured inkjet inks

UV cured inks offer many advantages over traditional drying methods. In particular, UV cured inks are more resistant to physical and chemical attack, making them highly durable and superior to toner based digital printing systems. Like all the inks the company produces, Fujifilm has carefully blended a range of cosmetic, functional and operational properties to produce formulations that meet the needs of high speed digital label production.

High quality, vibrant colors with excellent application properties

Fujifilm Uvijet Graphium inks are designed to allow long runs of high quality labels and self-adhesive decals to be printed with excellent adhesion, resistance and durability. Achieved by careful management of the complex interaction between printhead, inks, UV curing components and overall system design.

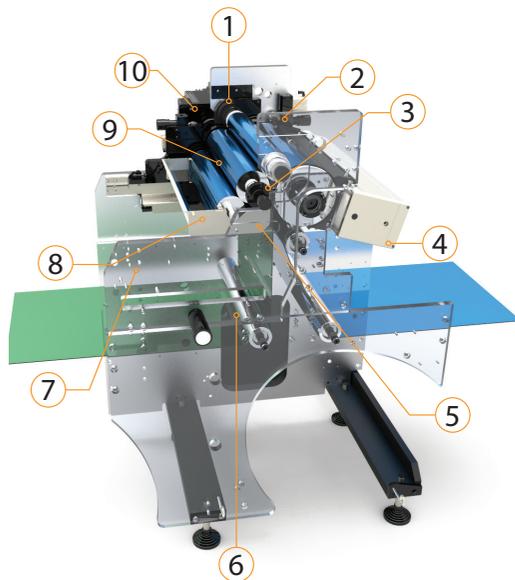
In addition to the vibrant colors, Uvijet Graphium inks also include an ultra-opaque white that can be printed at high speeds, setting a performance standard for digital label production that surpasses other digital technologies.

Summary of benefits

- ▶ Suitable for a wide range of applications
- ▶ Excellent adhesion to a wide range of substrates
- ▶ High strength pigmentation with wide color gamut
- ▶ High opacity white for background printing and fine detail with one hit of ink
- ▶ Compatible with typical finishing processes

Uvijet
GRAPHIUM

IN-LINE FLEXOGRAPHIC PRINTING

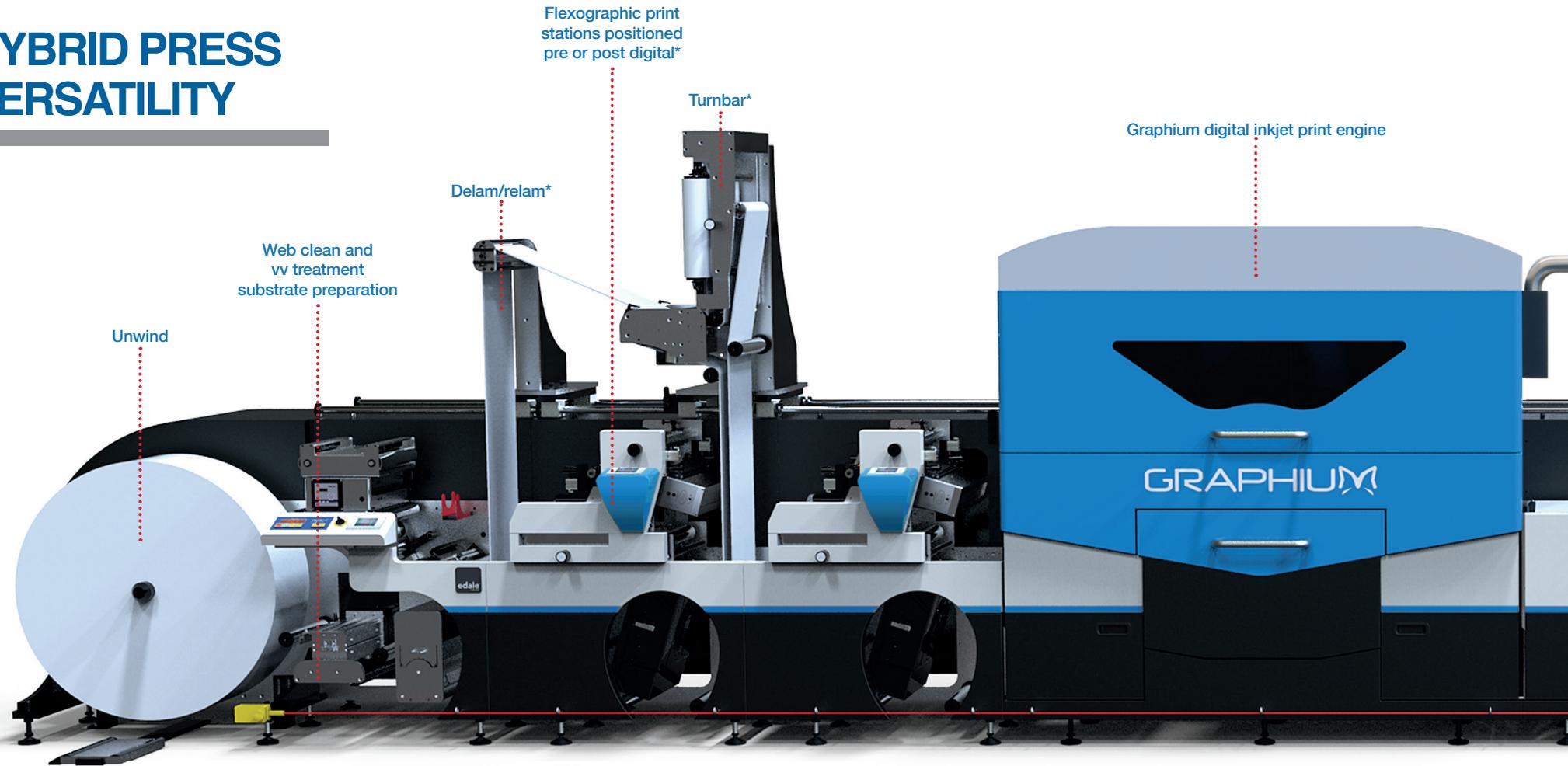


Any job is possible with hybrid production, including pre-coat, spot colors, metallic inks, varnish, foil, high opacity, shrink sleeve white, and much more. The Graphium flexographic print head utilizes UniPrint technology delivering industry leading print quality and consistency across a range of format sizes.

1. Pre-register and print strike features on all print units limit set up waste to 50 feet for a six color machine.
2. Gearless impression system enables a substrate range from 12-450 microns without adjustment.
3. UniPrint technology delivers industry leading print quality and consistency across a range of format sizes.
4. Quick release plate roll, anilox and inking system enables a color change in under 70 seconds.
5. Calibrated print and inking impression adjusters ensure quick and precise pressure adjustments.

6. Short inter-print web path of less than 5 feet which minimizes set up waste.
7. Print module comprising of a high quality, dual side frame, base section machined from cast and machined aluminium tool plate.
8. Three level ink pan combined with drip tray enables rapid color changes.
9. Color change on-the-fly means stations can be set for the next job during production.
10. Direct servo drive allows pinpoint precision and control.

HYBRID PRESS VERSATILITY



FAST ROLL AND MEDIA CHANGES

Graphium provides excellent substrate handling for digital workloads, making changeovers highly efficient with minimal material waste.

Graphium provides excellent substrate handling for digital workflows, key features such as cantilevered servo driver air mandrel, assisted roll lift, automatic take up and automatic tension control provide highly efficient changeovers with optimal setup and minimum material waste.

USE EXISTING SOURCED MEDIA

Graphium is designed to work with the media you use today.

Graphium ensures excellent print quality and color gamut on a wide range of standard materials, with 39" OD (1000mm), 880lbs capacity. This capability comes from the integration of a web guide with ultra-sonic edge sensor, web cleaning and corona treatment being standard.

AUTOMATED BACK PRINTING

Graphium has remarkable flexibility and can back print dual sided on unsupported films including the adhesive side of self-adhesive label stock. For added flexibility optional rail mounted turnbar and delam/relamination units can be positioned between print stations and feature integrated cross register control.

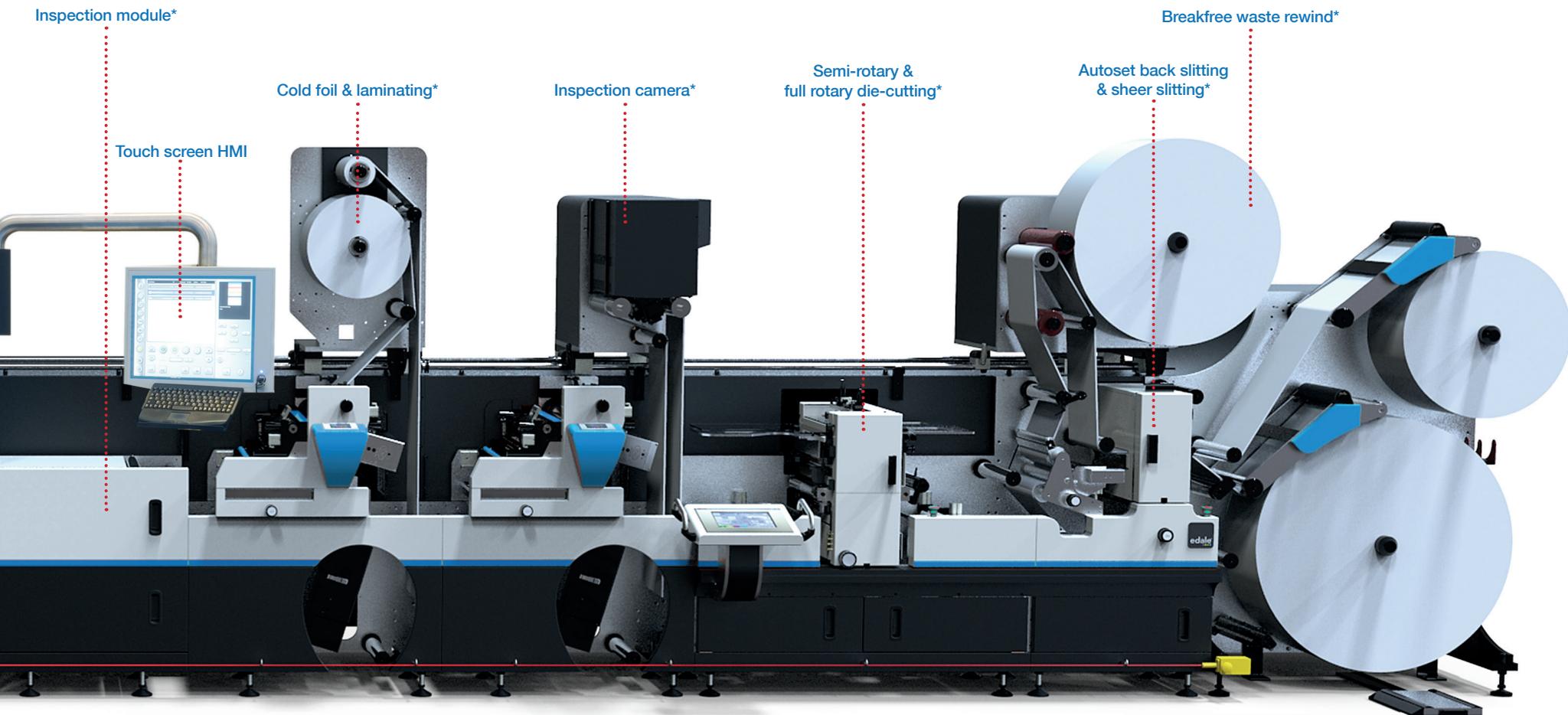
GRAPHIUM DIGITAL PRINT ENGINE

Graphium's print heads and innovative ink systems provide industrial grade reliability and optimal uptime, ensuring continuous trouble-free converting.

Graphium's wide web width of 16" and fast print speed allows high productivity of up to 11,920sqft/hr with up to 6 different inks.

Unique LED inter-color pinning provides precise ink lay down and cure control, which ensures remarkable image quality and adhesion properties.

Graphium's color management system allows accurate ISO 12647-2 compliant CMYK printing and wide gamut spot color emulation.



GRAPHIUM LABEL WORKFLOW

Graphium Label Workflow is designed to maximize the benefits of hybrid printing. It's a highly automated and integrated solution, which can either run your entire pre-press or simply operate as a slave to your existing system.

It provides full intelligent automation from 1up PDF to stepped layout in seconds. Intelligent automation can generate layouts using JDF stripping templates using rules, data from MIS system or directly from CAD/PDF files.

Versioning, ganging, document splitting, page box editing, color mapping are all supported as is full color variable data using PDF/VT.

FLEXIBLE HYBRID LABEL PRODUCTION

Any job is possible with hybrid production, including pre-coat, varnish, spot color, spot white, shrink sleeve white, metallic and CMYK pre-printing using UV or aqueous flexo inks.

The latest design, fully integrated flexo units offer short web path, direct servo drive to anilox, color change in 70 sec, rapid on press color matching and unique Uni-Print 90° head geometry to ensure consistent quality at any repeat length without need for adjustment.

CONVERTING OPTIONS AND AUXILIARY MODULES

Graphium can be configured with a very wide range of finishing options.

Lamination and cold foil bar allows inline lamination using self-adhesive, liner and wet adhesive solutions, traditional flexo or digital foiling capabilities. Piggy-back and peel and reveal labels are also possible.

Closed loop option for lamination of unsupported thin films.

Allows digital, spot varnish, tactile effects, white and black overprinting and digital cold foil.

100% inspection is achieved with the addition of inspection camera.

AUTOMATED FINISHING

The Graphium system provides automated setup, designed to save time and reduce waste.

Combining the performance of digital and flexibility of inline converting enables unprecedented levels of productivity. Options include low cost 3-stage rotary or fully automated semi-rotary die-cutting, automatic die load and unloading.

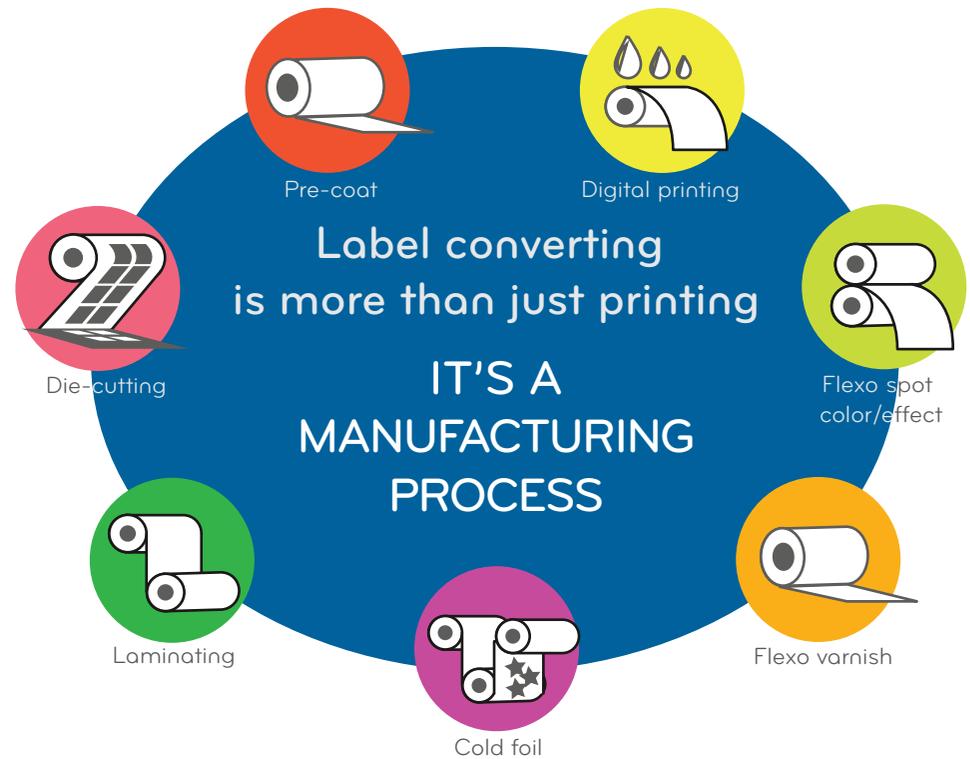
Flexible waste stripping section with open access, hybrid waste matrix stripping (standard and 'break-free'), auto-set back slitting system, auto-set razor, crush and shear slitting system.

Dual rewind with web advance roll followers.

*Optional

GRAPHIUM HYBRID APPLICATIONS

When it comes to producing labels, converters know that to produce a label it goes way beyond the printing process. The entire construction and application of a label must be considered. Printing is just a small part of the manufacturing process. Like with any manufacturing process, producers want to be making their product in the most efficient way possible. In the case of labels, that often requires printing, varnishing, laminating, foiling, die-cutting and much more. Hybrid presses allow converters the ability to do all of these functions in a single-pass manufacturing process. Having the versatility and efficiencies of a digital printing engine in-line with analog flexo processes provide the options for the best way to produce a label. In this section we will explore the different capabilities of Graphium Hybrid printing, taking a look at jobs that are fully finished in line, and combine both analog and digital printing where appropriate.



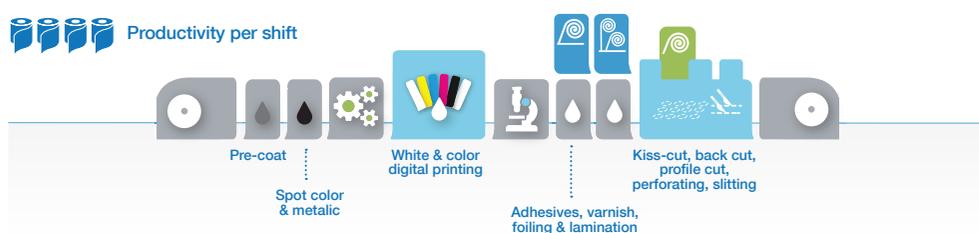
IN-LINE FINISHING CAPABILITIES

Automated Finishing, Die Cutting, and Sheeting

DIGITAL WITH NEAR LINE FINISHING



HYBRID LABEL CONVERSION IN A SINGLE PASS



Graphium is a modular system that can be expanded to incorporate traditional technologies such as a wide range of print finishing solutions. Graphium brings a new dimension to digital printers by offering the user the choice to configure the machine with in-line finishing taking advantage of the efficiencies of single pass printing. With this flexibility, using Graphium widens the range of jobs that a printer can choose to print digital as well as the length of job that can be economically processed. Graphium has the ability to be configured with inline, offline, or nearline finishing. In-line finishing can be accomplished via standard full rotary die tooling, or a variable semi-rotary finishing solution that cuts down on set-up times and tooling costs.

TRUE SPOT COLOR PRINTING



With Graphium, all labels can be produced fit for purpose, accomplishing all of your clients demands, in the most profitable way. In this example, we will take a look at a typical prime label with text, a process image, and a true spot brand color. Many clients still like the look and brand integrity of a true PMS spot color. Further, not all PMS colors can be reproduced accurately with process printing. For this reason, converters still print spot colors with process work when necessary. Labels that are ordered in smaller quantities are no exception to these requirements. The client requesting this label is requiring that true brand color to be printed, thus forcing the converter to print flexographically. On Graphium, this label can be produced by printing just the brand color with Flexo, and the rest of the label using process digital inks. As you can see with the results below, there is a significant cost savings in producing this label Hybrid, vs 100% Flexo. The Hybrid printing allows the label to be produced in the most cost effective way, yet maintaining the brand color integrity.

| | Flexo Only | Hybrid Digital + Flexo |
|-----------------------|-----------------|------------------------|
| Substrate | White BOPP | White BOPP |
| Label Quantity | 25,000 | 25,000 |
| Substrate Cost | \$130 | \$105 |
| Burdon Rate | \$278 (70 mins) | \$99 (23 mins) |
| Plate Cost | \$200 | \$40 |
| Ink Cost | \$8 | \$46 |
| Total Job Cost | \$616 | \$290 |
| Cost Per Label | \$0.0246 | \$0.0116 |

*estimated

LONG RUN VARIABLE DATA PRINTING

In today's evolving label and packaging economy, brand owners are looking for new innovative ways to market and sell their product. This new one on one marketing technique requires individualizations of labels and packaging. Variable data printing has traditionally always been done by digital machines producing 100% of the label. But, for longer run lengths, this is not the most cost effective way to produce these labels. Let's take a look at this honey label. As you can see, the majority of the label is a static print with text and Graphic. There is a small bit of variable text with a variable image, allowing for customizable labels that can be marketed or ordered for an individual. Hybrid printing is the ideal way to produce this label, allowing for all the static components of the label to be done via lower-cost flexographic printing, utilizing digital printing only when necessary.

| | Digital Only | Hybrid Digital + Flexo |
|-----------------------|------------------|------------------------|
| Substrate | Semi-Gloss Paper | Semi-Gloss Paper |
| Label Quantity | 500,000 | 500,000 |
| Substrate Cost | \$3,192 | \$3,192 |
| Burdon Rate | \$1,686 | \$1,686 |
| Plate Cost | \$0 | \$120 |
| Ink Cost | \$1,483 | \$512 |
| Total Job Cost | \$6,362 | \$5,646 |
| Cost Per Label | \$0.0127 | \$0.0113 |

*estimated



TECHNICAL SPECIFICATION

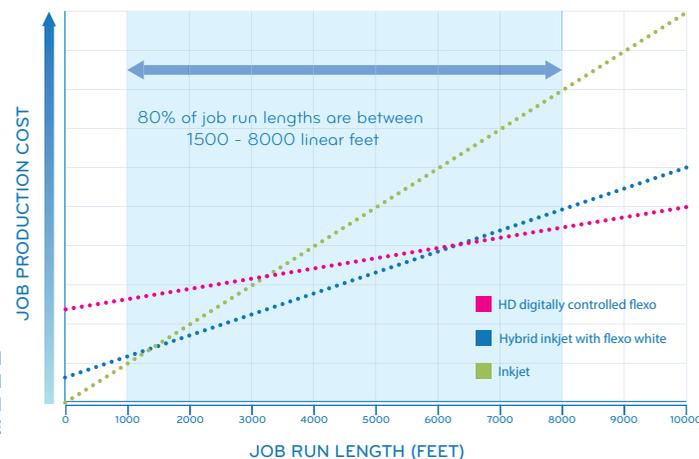
| Speed | Feet/min | Meters/min |
|--|--|--------------------|
| CMYK | 150 | 45 |
| CMYKW | 131 | 40 |
| Productivity | Sq.feet/hr | Sq.meters/hr |
| 16" (410mm) CMYK | 11920 | 1107 |
| 16" (410mm) CMYKW | 10590 | 984 |
| Ink specifications | | |
| Uvijet Graphium from Fujifilm - ISO optimized UV-curable ink with 'Micro-V' dispersion technology. | | |
| Image size | Inches | mm |
| Max image width | 16.125 | 410 |
| Max image length | 39 | 1,000 |
| Max image length with banner print option | 394 | 10,000 |
| Max image length tiled | Unlimited | Unlimited |
| Print technology | | |
| UV inkjet DoD | 1018dpi perceived (360dpi native over 8 grey levels) | |
| Substrate | | |
| Cartonboard* | 9.8 - 17.7mil | 250-450µm |
| Supported & unsupported paper | 1.6 - 17.7mil | 40-450µm |
| Supported film (PP, PE, BOPP, BOPPET, PVC etc.) | 0.47 - 17.7mil | 12-450µm |
| Unsupported film (PP, PE, BOPP, BOPPET, PVC etc.) | 1.6 - 23.5mil | 40-600µm (>450µm*) |
| Max substrate width | 17" | 432mm |
| Min substrate width | 8.5" | 216mm |
| Max roll diameter | 39" | 1,000mm |
| Max roll weight | 881lb | 400kg |
| Substrates | | |
| Most standard self-adhesive label and packaging materials | Papers (coated, uncoated, high-gloss, cast-coated, thermal). Filmic such as PVC, PE, PET, PP, OPP, metalized material and carton board. | |
| Digital front end | | |
| Control panel | Touch-screen HMI | |
| Graphium Label Workflow | Label Production RIP Workflow | |
| Registration/manual inspection camera | Handheld USB loupe mounted on HMI | |
| Footprint dimensions | Inches | mm |
| Minimum footprint (no flexo/finishing units) | 268 x 158 | 6,800 x 4,000 |
| Power | | |
| Frequency | 50-60Hz | |
| Voltage | 380 to 440V 3-phase, neutral and earth | |
| Power (no flexo/finishing units) | 25kw 32A | |
| Air specifications | | |
| Room temperature min | 64°F (18C) | |
| Room temperature max | 77°F (25C) | |
| Thermal fluctuation max | 3.6°F/hour (2°C/hour) | |
| Relative humidity min | 25% | |
| Relative humidity max | 60% | |
| Max ambient temperature | 90°F (32C) | |

*Requires qualification

TAKE CONTROL OF YOUR LABEL PRODUCTION COSTS

Manipulate the crossover point to achieve a significant ROI – sooner. Graphium hybrid technology provides the unique ability to balance setup cost against running cost. Graphium offers the lowest cost 'medium run' length production possible.

PRODUCTION COSTS COMPARISON OF 4IN X 6IN LABEL WITH OPAQUE WHITE



LEARN MORE ONLINE

To learn more about the Graphium, you can either contact your local sales rep with the contact information at the bottom of this page, or check out our extensive online content on the Graphium including videos, articles, and much more. Visit www.fujifilminkjet.com for more information.

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FUJIFILM North America Corporation, Graphic Systems Division

Phone: 800.877.0555 • Email: contactgraphics@fujifilm.com • Web: www.fujifilminkjet.com graphium_160823



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