



GUIDE TO OFFSET PRINTING



solutions to impress

Introduction

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Guide to Offset Printing

Here you will find answers on:

- General
- The Offset Process
- Environment
- Costs
- Conclusion
- Contiweb Thallo

Offset lithography is one of the most common methods of creating printed material.

General

1. What is offset printing?

Offset printing or web offset printing is a commonly used printing technique in which the inked image is transferred (or "offset") from a plate to a rubber blanket, then onto the printing surface.

When used in combination with the lithographic process – which is based on the repulsion of oil and water – the offset technique employs a flat (planographic) image carrier (printing plate) on which the image to be printed obtains ink from ink form rollers.

The non-printing area attracts a water-based film (called "fountain solution") ensuring that the non-printing areas are kept ink-free.

2. What is variable sleeve offset technology?

Variable sleeve offset technology allows printers to print web offset in variable sizes (repeats). This technology allows sizes to be easily changed with two lightweight sleeves without the need to change the unit or "print cartridge". This provides a very cost-effective method of printing different repeat lengths.

3. How popular is offset printing?

Offset lithography is one of the most common methods of creating printed material. Common applications include: newspapers, magazines, brochures, stationery and books.

Today, offset printing is gaining popularity in flexible packaging. Previously, the technology was regarded as too expensive to produce packaging of varying repeats – a must in flexible packaging. However, advances in variable sleeve offset have removed this barrier and web offset is gaining momentum as a cost-effective alternative to flexo and gravure printing technologies.

4. As a converter, why would I use offset?

The variety of packaging available on retail shelves today is very different to that of ten years ago. Packaging now incorporates an enormous variety of flavors, pack sizes, regional, seasonal and promotional packages. This has seen average order sizes reduce dramatically in recent years. Here, the challenge lies with converters and brand owners alike. Converters still need to make profits on shorter runs and brand owners need to make regular design changes but want to avoid the expensive set-up costs associated with flexo and rotogravure.

Offset technology addresses these issues head on, excelling in runs that are too short to be profitable on flexo or gravure presses, but too long to be economically viable on digital. Offset printing plates cost a fraction of flexo photopolymer plates and gravure cylinders and can also be produced in a much shorter timeframe. They are machine ready just minutes after a new image file is received, compared to hours, days or even weeks with other processes. Consequently, inventory costs for storing gravure cylinders or photopolymer plates can be slashed and lead times accelerated. Brand owners can respond quickly to competitor marketing campaigns or sports and social events.

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Using offset technology you can print on virtually any packaging substrate.

The Offset Process

1. How does the plate-making process work?

Offset pre-press is a standardized process conducted in-house by printing companies. The offset plate is a thin aluminum plate that is used to transfer images to the offset blanket.

The imaging process:

An ink-accepting coating is applied to a base material. The coating is light sensitive with a thickness of around $1\mu\text{m}$, whilst the base material is usually a polymer. The plate is exposed and developed and the remains of the original (ink-accepting) light-sensitive coating create the image.

An offset plate is not only up to ten times more affordable than a flexo cliché but can be produced within several minutes. This makes the technology ideal for short run work that requires rapid turnaround times.

2. Why is an offset blanket required?

The blanket for offset printing is an integral part of the printing process, directly affecting the quality of the printed image. A high-quality blanket not only needs to transfer a clear image from the plate to the substrate, but also operate reliably at high speeds with different substrates. Blankets are also required to spread dampening solution evenly as well as correct any irregularities in thickness to ensure accurate output.

3. What is an offset plate gap?

The offset plate gap is a non-printable area of around 2mm in each repeat on the printed substrate. As the below image shows, this is the area where the two ends of the plate meet. This means that some designs, that are mainly currently printed by gravure, requiring an uneven continuous print cannot be performed with an offset press.

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Possible



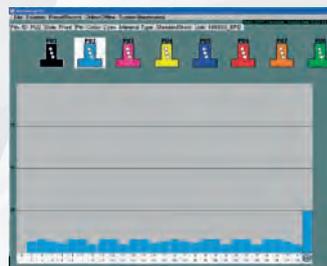
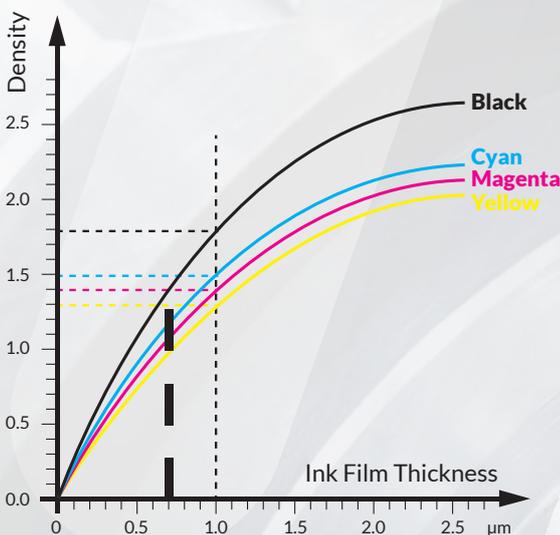
Possible

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Unlike flexo, offset ink film thickness is not dependent on the use of an anilox roller.

4. How do you control color on an offset press?

Like any printing process, offset color or the density of color is primarily determined by ink film thickness. Unlike flexo, offset ink film thickness is not dependent on the use of an anilox roller. Using offset, the amount of ink can be adjusted across the web and on the run using a segmented ink fountain with ink keys.



5 What is CIP-3/4?

CIP3 or CIP4 (.cip) is a file format used to transfer data about a specific file through the production process. In addition to previews, CIP files also contain information related to separations, ink coverage, job dimensions etc.

The Contiweb Thallo press can convert CIP3 and CIP4 standard files from CtP systems and uses these to calculate preset values for the ink keys in the ink fountain.

6. What are the possibilities of offset CMYK and extended gamut printing?

As offset prints high definition line screen as standard, it is possible to print a higher gamut of colors with a standardized four-color process. This is also true of extended gamut processes such as **Equinox** by **Esko**. When printing in an extended gamut perfect registration becomes crucial. Offset can guarantee an extremely tight register when printing, ideal for jobs such as barcodes that incorporate more than one color. Offset printing doesn't require anilox rollers to determine ink volumes. The volume of ink can vary across the width of the web depending on where it is needed by opening and closing the ink keys. This means that only one print unit is required when producing both solid blocks and fine detail with a particular color in the image.

7. Why does offset use fewer colors?

Offset printing does not require anilox rollers to determine ink volumes. The volume of ink can be adjusted across the width of the web depending on where it is needed by opening and closing the ink keys. This means that only one print unit is required when producing both solid blocks and fine detail with a particular color in the image.

Another reason for offset needing fewer colors, is the possibility to print in an extended gamut. By doing so, you can cover 94% of all pantone colors, which dramatically reduces the amount of different colors that need to be stocked.

8. What inks do offset systems use?

In offset printing for packaging, converters use highly viscose energy curable inks e.g. Electron-Beam/Ultra-Violet. Generally, a benefit of these inks is that they do not contain solvents or a water component that needs to evaporate. This means that they cure instantly and allow further converting almost immediately.

9. How do the inks dry?

The inks crosslink either by activation of photo initiators or through electrons. This not only means they are more environmentally friendly, but also reduces ink usage as there is no evaporation. Offset printing guarantees that 100% of the ink used in the printing process will end up on the substrate.

10. On average, how long is a job changeover?

First of all, by printing in an extended gamut, most job changes do not require a color change. However, should a color change be required, this does not take long on offset systems like the Contiweb Thallo. Converters need only change two sleeves – the plate sleeve, and the blanket sleeve. This can be done in just two minutes per printing unit. Largely, the length of a job change is determined by the number of color changes. The Thallo has an automatic washing option that washes all the print rollers inside each unit in just five minutes.

11. How many operators do I need?

On average, an offset press is staffed by two operators, however it depends on the complexity of the machine. In general, offset machines are used for shorter run work than flexo or gravure, meaning frequent job changes. At job changes, a lot of activities can be done simultaneously meaning two press operators can ensure an even quicker change-over.

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Offset printing guarantees that 100% of the ink used in the printing process will end up on the substrate.

Environment

What is the environmental impact of offset printing?

The use of curable inks makes offset an environmental-friendly technology:

- No explosion-proof storage for solvents and inks required -> reduced footprint
- No storage for residual inks and solvents -> reduced footprint
- No big ink mixing stations -> no energy consumption
- No washing machine for system parts, cylinders and anilox rollers -> no energy consumption, or solvent waste
- Solvents that evaporate during drying cannot just be expelled -> no solvent recovery or incinerating, no gas consumption for solvent incinerating
- No inventory requirement for printing cylinders / plates -> reduces inventory costs
- No health and safety concerns for employees due to the elimination of solvents
- Significantly lower insurance costs -> greater financial control
- The web reverse possibility is cost-efficient and environmentally friendly

Costs

1. What is the price of the inks used?

Although the price of offset inks is higher than those used for flexo and gravure printing, lower consumption of ink balances overall running costs. This is due to two reasons:

- Offset inks are 100% solid. Consequently, every drop of ink will end up on the actual substrate (as described in the Offset Process section).
- Ink film thickness on the printed web is much thinner, so less ink is used on the substrate

2. What does it cost to produce a plate?

Rotogravure cylinders are very expensive. Production of these cylinders typically take about a week and is frequently outsourced, reducing flexibility.

Flexo plates are cheaper, but still a significant part of the start-up cost.

Offset plates are by far the cheapest. Production can be done in-house and costs around €10-15 €/m² readymade. This is particularly advantageous when it comes to short runs when many plates may be required.

3. How does the price of an offset press compare to a flexo or gravure press?

The initial investment of an offset press is higher than that of a flexo or gravure system. However, an offset press delivers many financial benefits, particularly for short run work. Fast set-up and rapid job changes along with cheaper day-to-day running costs deliver fast ROI, making offset a very attractive solution for short run packaging jobs.

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The use of curable inks makes offset an environmental-friendly technology

Conclusion

In summary, offset technology allows print businesses to maintain a competitive edge and a healthy margin when producing smaller jobs. In terms of job sizes, it fills the gap between flexo and digital. With the capability to set-up new jobs within minutes, offset technology dramatically slashes time-consuming changeovers. Crucially this allows businesses to increase throughput and exceed customer expectations for job turnarounds.

Also, when it comes to substrates, offset is very flexible. It is possible to print on most of the commonly used packaging substrates including PET, OPP, BOPP, PE, LDPE, MET/PET, coated and uncoated papers, along with most common multi-layer laminates used in the flexible packaging industry.

Offset delivers supreme quality. It is possible to print in high resolution and extremely tight register, allowing brands to achieve shelf appeal.

Last but not least, the usage of energy curable inks makes offset an environmentally-friendly technology.

Read more about the experiences of other printers with offset.

[Download the Wesselink Case Study.](#)

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Offset technology allows print businesses to maintain a competitive edge and a healthy margin when producing smaller jobs.

Contiweb Thallo

Proposition of the Contiweb Thallo:

Engineered and developed with the experienced leading web offset service provider, DG Press, the Contiweb Thallo offset press prints on a wide range of substrates – including film, foil, paper and cardboard. This allows print service providers to expand their service offerings by outputting a wide range of folding carton, flexible packaging, preprint and label applications. Available in a range of web widths, the system caters to print businesses of all sizes, seamlessly integrating with minimal workflow disruption and maintaining uptime.

The Contiweb Thallo is designed on a modular inline platform that integrates with flexo and rotogravure systems to offer even more flexibility and is compatible with all Contiweb unwinding and rewinding solutions. Food-safe inks, coating and curing solutions without VOCs (Volatile Organic Compounds), plus a focus on waste reduction, make the Thallo an excellent choice for food packaging and environmental sustainability.

ADVANTAGES:

- Economic hybrid system with fast ROI
- Premium offset print quality
- Affordable, fast variable-sleeve size changes
- Fast make-readies
- Lower cost offset plates
- High productivity
- Very suitable for smaller jobs

FEATURES

- Available in three web widths 520 mm (20,5"), 850 mm (33,5") and 1050 mm (41,375")
- Advanced tension control
- Low waste start-up with web reversing
- User friendly, flexible interface
- Suitable for film, paper and board-based applications

Read more about Contiweb Thallo [here](#) or contact the [Contiweb sales department](#).

1. What substrates are available?

The Contiweb Thallo can print on virtually any packaging substrate. This includes popular film substrates such as, PET, OPP, BOPP, PE, LDPE, MET/PET, coated and uncoated papers, along with the most common multi-layer laminates used in the flexible packaging industry. Heavier substrates such as paperboard for folding carton or aseptic packaging can also be handled on the board version of the Thallo.

2. What is the speed of an offset press?

The Contiweb Thallo can print at 400 linear meters or 1300 linear feet per minute. The production speed depends on the specific job characteristics.

3. What web width options are available?

WEB WIDTH:

- 520 mm (20.5")
- 850 mm (33.5")
- 1050 mm (41.375")

4. Are hybrid configurations possible?

The Contiweb Thallo is designed on a modular in-line platform which enables maximum flexibility and future proofing. This modular hybrid system allows converters to combine all the benefits of web offset with the inherent advantages that flexo, gravure and digital can offer. This results in a truly flexible solution that not only meets today's tough market demands but can also adapt easily for the future.

BENEFITS

- Flexible configurations
- Hybrid – combine the best attributes of each print process
- Future-proof – easily reconfigurable

5. Can the Contiweb Thallo print food packaging?

Ink migration is a prime concern for brand owners and converters. The slightest hint of change on a packed product could have huge ramifications and cause long-term damage to a brand – sometimes even destroying the business.

EB/UV offset is a certified and working solution for converters operating in the food packaging industry with a wide variety of proven chemistries (inks and coatings) and curing solutions available. Both curing options can be applied to the Contiweb Thallo and meet the requirements of food safety.

The Contiweb Thallo can print at 400 linear meters or 1300 linear feet per minute.