Stora Enso DBS Powered by Xeikon

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Abstract

In the beginning of 2004, Stora Enso and Xeikon signed a technical cooperation agreement to combine the Stora Enso's Discbox Slider (DBS) concept and packaging system with a Xeikon digital printing press. This solution was first jointly presented at Drupa 2004 in Düsseldorf and Media-Tech Expo 2004 in Frankfurt under the name: "Stora Enso DBS powered by Xeikon"

The configuration consists of the Xeikon 5000 printing on Stora Enso's Ensogloss DBS 350 g/m² cardboard with inline finishing system plus the Stora Enso DBS Pac Master.

The product of this configuration is called a "DBS Pack" which is a 100% cardboard package for all CD and DVD media.

This fully integrated solution allows the on-demand production of DBS Packs with short lead-times, fast turnaround and full color personalization in a cost efficient and environmentally friendly way for order sizes ranging from one up to thousands.

Figure 1. Stora Enso Discbox Slider (DBS)

Introduction

In today's fast moving marketplace, product life cycles are becoming shorter and target audiences more fragmented. The result of this is a demand for smaller runs, different versions and shorter lead times but for the same price. The challenge for a packaging printer - converter is to meet his customer's demand and to safeguard his margins at the same time …

The answer to this challenge is to be found in the integration of digital printing technology in the packaging industry. The "Stora Enso DBS powered by Xeikon" configuration is a perfect example of how digital printing technology is re-engineering a media packaging value chain and introduces new and profit enhancing business models.

Configuration

The standard "Stora Enso DBS powered by Xeikon" configuration consists of:

Unwinder - K105 X

The Ensogloss DBS 350 g/m² (± 400 µm) cardboard is fed to the digital printing press by a Kern unwinder K105 X.

Digital Printing Press - Xeikon 5000

The Xeikon 5000 is a digital printing press with a LED array based dry toner electro-photographic process and is printing on the Ensogloss DBS 350 g/m² in CMYK with a resolution of 600 dpi – 4 bps using One-Pass-Duplex™ printing technology.

Optional a fifth color station is available for spot and security toners for e.g. corporate colors, anti-counterfeiting …

Driven by the X-800 Digital Front End, the system can handle complex variable data jobs in full color, using a PPML workflow.

The DBS Pack consists of two elements called the DBS Sleeve (Outside) and Slide (Inside), which are printed in an endless web at a speed of 23 complete DBS Packs per minute.

Finishing - DBS Converter

Subsequently the digitally printed web is converted into DBS Sleeves and Slides by the inline finishing system, namely the DBS Converter which consists of the following modules:

Exiting the Xeikon 5000, the web is guided into a Buffer module with balancing rollers and has been integrated to enable the operator to do short interventions on the DBS Converter like changing the waste roll, output boxes ... without having to stop printing.

On halting or slowing down the DBS Converter, the balancing rollers will start to move up to create a buffer of maximum 15 meters (or 2 minutes 45 seconds). Re-starting or speeding up the system will empty the buffer by bringing the balancing rollers back down.

Entering the DBS Converter, the web is first guided to the edge by an integrated Web Guide module (FIFE) with ultrasonic sensor.

Before Die-Cutting and Creasing the web is UV varnished using a standard UV Flexo station. However the Print Roller is split into 3 parts and is not varnishing the full width of the web. The reason for this setup is that the glue flaps of a DBS Sleeve are a "No Printing or Varnish" area to keep a good (and permanent) adhesive strength on the glue flaps.

To obtain a glossy and smooth surface, the UV varnish is super calendered by a 20 µm BOPP (Bi-Oriented PP) foil at the time of curing. The Supergloss foil is supplied from the top unwinder and is joined with the uncured web in a nip under pressure. The varnish is cured through the foil by a focused UV line (up to 140 W/cm) from a cold UV Curing station with a 5kW water cooled bulb. Following the Supergloss foil is separated from the cured web and rewound by the bottom rewinder and can be re-used up to 3 times. In other words this Supergloss finishing combines the look and feel of lamination with the price for only varnishing.

The UV varnished web is then converted into DBS Sleeves and Slides by a fully rotative Die-Cut and Crease station with a 28" male and female cylinder. The register control system reads the first marker on the web to synchronize the cylinders within 1 mm. The operator activates (read: brings in contact) the cylinders from the Control Panel and the system starts converting the web to DBS Sleeves and Slides. The fine tuning of the along web register is done by reading the subsequent markers and speeding up or slowing down the cylinders, changing the register by 0.1 mm per revolution.

The cylinder layout contains in total 3 sets of a DBS Sleeve and Slide or 3 complete DBS Packs. The blanks are imposed in a DBS Sleeve lane (left) and Slide lane (right) and a mixed lane (middle).

On exiting the Die-Cut and Crease cylinders, the blanks are transported to a Stacker module with collector boxes by a Conveyor Belt with an integrated Pick and Place module which sorts out the mixed lane into the respective DBS Sleeve or Slide lane.

To ensure a constant web tension during converting, the waste matrix is rewound. The speed and tension on the Waste Rewinder are controlled by a dancer arm. The maximum waste roll diameter is 400 mm or about 45 minutes printing.

Finishing - DBS Pac Master (Offline)

The fully automated DBS Pac Master is folding and gluing the DBS Sleeves and Slides into DBS Packs inserting one or two discs with optional a booklet up to 32 pages at a speed of 50 DBS Packs per minute.

The system also provides an efficient way of tackling counterfeiting and theft by inserting alarm labels.

Get on Board!

The DBS Pack is a 100% cardboard packaging solution for all CD and DVD media with numerous ecological, logistical, storage and usage advantages. For example the DBS Pack is 30% slimmer and 50% lighter than a plastic jewel case, resulting in significant savings on material, transport and storage costs. Using 100% recyclable cardboard the DBS Pack is not only an environmentally friendly but also a lightweight crack and break proof disc packaging solution suitable for frequent use and travel. The large visible area and layout of a DBS Pack offers unlimited graphical possibilities.

Re-engineering the Value Chain

The fully integrated "Stora Enso DBS powered by Xeikon" configuration is not only adding the advantages of digital printing to the DBS value chain like e.g. on demand, short runs, fast turnaround, stock reduction, full color personalization, segmentation, versioning, serial numbers, barcodes… but is also re-engineering the value chain to e.g. the Replicator - Duplicator becoming a "Total Solution Provider" by not only offering the disc production but also the printing, converting and packing.

The integration of digital printing is not only meeting the growing demand for cost efficient, short run disc packaging solutions in the segment of music, movies, games, software, catalogues, manuals, promotions, B2B communication … but is also introducing new and profit enhancing business models by using e.g. the DBS Pack as a postal package for mailings and direct marketing.

Biography

Angelo Baert graduated as a Graphical Engineer at the "EGON" Industrial High School in Mariakerke, Belgium, He started working for the Digital Printing Systems (DPS) division of Agfa in Mortsel, Belgium in 1999. Following the acquisition of the DPS division in 2000, he continued working as Application Support Engineer for Xeikon in Mortsel, Belgium until the acquisition by Punch International in 2002. Resulting from his experience and commercial interest, he started working as Business Development Manager for Packaging and New Markets at Xeikon International in Lier, Belgium.

Since the 1st of December 2004, he is now working as Business Development Manager for Stora Enso Digital Solutions in Lier, Belgium which is a Joint Venture between Xeikon International and Stora Enso with a focus on the development, marketing and sales of total packaging solutions based on Xeikon digital printing technology and Stora Enso cardboard.