printing
graphic design
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Flexographic Ci-Printing Press | Rotova Press

Some technical specifications of flexographic CI-printing press at Broby Grafiska

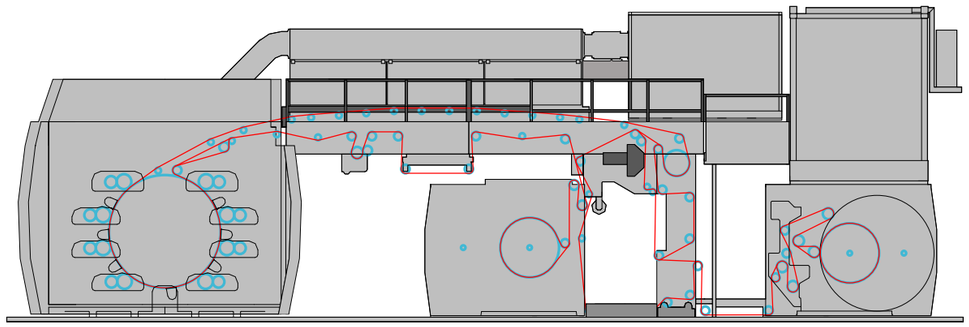

Figure 1. A sketch of the CI-printing press at Broby Grafiska.

FISCHER & KRECKE FLEXPRESS 6S

The printing press *(Figure 1)* at Broby Grafiska is a CI Flexo printing press (S6-8, Fischer & Krecke, Bielefeld, Germany). The press can be used for printing trials using water-borne or solvent-borne ink. The printing press has automatic viscosity control and temperature control of the ink (COLORControl 3000, Drucktechnik Bloss, Leonberg, Germany).

The press has an autoclean ink-washing system for anilox roll, doctor blade and ink hoses. The central cylinder has eight surrounding printing units with intermediate station dryers.

For web inspection, register control and print defect detection during printing, the press is equipped with a video camera system (Web Video 3000, Eltromat, Leopoldshöhe, Germany) and for spectral colour (L a b) and print density measurements, spectraCon (Theta System Elektronik GmbH, Münich, Germany). The press has a maximum printing speed of 400 m/min and a minimum printing speed of 31 m/min and an automatic splice system.

A variety of substrates can be printed, e.g. foil, flexible materials, and paper and carton board. The grammage may vary from 30 to 350 g/m2. The maximum substrate web width is 1300 mm (minimum 650 mm but 300 mm is possible) and the print width 1250 mm, but at maximum grammage the maximum web width is less than this. The substrate is wound up on a socket with a diameter of 76 or 150 mm. The maximum roll diameter is 1000 mm and maximum weight of 1250 kg. If the automatic splice system is to be used the roll diameter can not exceed 800 mm.

SPRECIFIKATION F & K FLEXOPRESS 6S

CI-Press, Central Impression Printing Press
Automatic Slice System

Circumference	460, 470, 480, 650 mm
Plate thickness	1.14 mm and 1.70 mm
Treating is not possible	
Printing units	8 st
Maximum substrate web width	1300 mm
Minimum substrate web width	650 mm
(but we have printed 300 mm)	
Maximum print width	1250 mm
Maximum printing speed	400 m/min
Minimum printing speed	31 m/min
Maximum roll diameter	1000 mm
Maximum weigh of roll	1250 kg
Socket diameter	76 mm and 150 mm

Waterbased and solventbased
Smallest amount of colour when printing 30 kg/coloor unit
Substrate thin film thick cardboard 30-350 g/m^2
When printing on thick substrate, > 250 g/m^2 the maximum material width is limited to maximum 900 mm.

smartGPS All registration and impression related set-up is done at the plate mounting stage with almost no additional time required.

Some technical specifications of Rotova press at Broby Grafiska

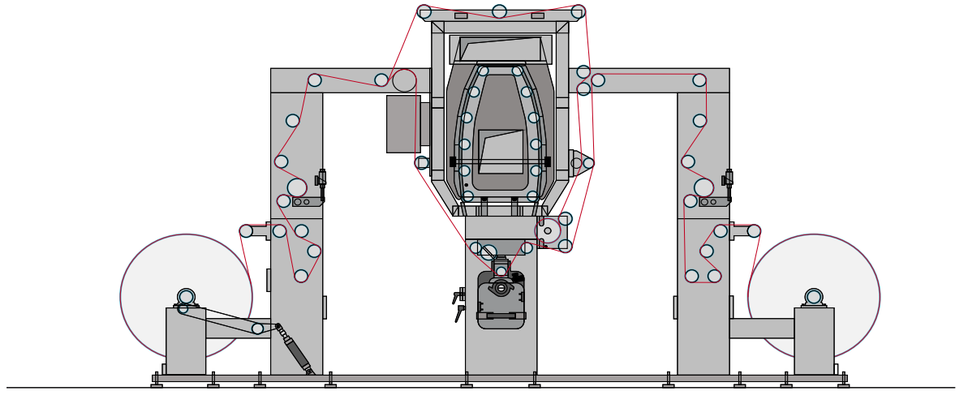

Figure 2. A sketch of the Rotova press at Broby Grafiska.

TECHNICAL SPECIFICATION

Printing techniques:	Rotogravure with electric assist and Flexography with controllable impression setting
Single colour:	Toulene based and for Flexographic printing solvent based, water based and UV ink
Printing speed:	500 m/min less with board
Printing width:	300 mm minimum 200 mm
Core diameter:	76 mm or 15 mm
Roll diameter:	1000 mm
Roll width:	320 mm
Roll weight:	300 kg

ROTOCOLOR ROTOVA 300

Rotocolor Rotova 300 (Rotocolor AG Druckmaschinenfabrik, Lyss, Schweiz) is an example of Broby Grafiska's test printing resources. It is a web press providing excellent possibilities to perform relevant test printings in rotogravure and flexography. The press is used in the development of paper to meet high demands on print quality.

Rotocolor Rotova 300 is a single-colour, narrow web press for rotogravure and flexo printing. In rotogravure on publication paper with toluene based ink the speed is 500 m/min. Printing on board with solvent or water based inks can be performed at lower speeds.

The press is equipped with an adjustable electric assist for rotogravure. The Rotocolor Rotova 300 has an interchangeable flexo unit with controllable impression setting. Flexo printing can be performed with solvent, water or UV inks on paper and board. There is two banded anilox rolls with various screening.

Anilox rolls

FISCHER & KRECKE

Number	Manufacturer	Screening [l/cm]	Angle [°]	Cup form	Nominal cell volume [cm³/m²]
4	Harper, Herford, German	420	60	hexagonal	3.25
6	”	355	”	”	4
7	Zecher, German	280	”	”	5.5
1	Harper, Herford, German	120	”	”	10
1	”	217	”	”	6
1	”	173	”	”	7
4	Praxair Surface Technologies, Meyrin, Schwitzerland	210	”	”	7
4	”	170	”	”	9
1	Apex, Harpert, Netherlands	UniCorr L			12-
1	”	UniFlex			8-12
1	”	UniFlex			4 - 6

Table 1. Anilox rolls Ficher & Krecke at Broby Grafiska

ROTOVA 300

Number	Manufacturer	Screening [l/cm]	Angle [°]	Cup form	Nominal cell volume [cm³/m²]
4	Harper, Herford, German	350	60	hexagonal	2.52
6	”	280	”	”	5.44
1	”	170	”	”	8.89

Table 2. Anilox rolls Rotova 300at Broby Grafiska

Plates

The standard thicknesses of the plates are 1.14 and 1.7 mm, but 2.84 mm is also possible (Table 3). The plates are stored at room temperature, horizontally in the dark in the original package from the retailer.

The plates are washed in a plate washing machine (NT Flexo Plate Cleaner, Niels Thorups Eft. Horsens, Denmark). The plates are in the form of sleeves which can be slid onto the cylinder core.

Number of sleeves	Circumference [cm]	Tape thickness [mm]	Plate thickness [mm]	Property of sleeve	Type and Manufacturer
8	480	0.55	1.14	Hard	Polyflex ONYX, Polywest sleeve system, Anderson Vreeland
8	460	0.10	1.70		Rotec Hülensysteme, Flint Group
8	460				

Table 3. Standard plate, sleeve and tape assembly at Broby Grafiska

Anilox rolls

The primary role of the anilox roll is to transfer a finite amount of ink through small engraved cells to the printing plate. The engraved cells can have the shape of a truncated hexagonal cone with a specific volume (cm3/m2), and are distributed in a regular screen pattern over the anilox roll with a defined numbers of lines/cm.

To measure the cell volume of an anilox roll Broby Grafiska has a camera, AniCAM (Troika, Whiltshire, United Kingdom). The surface structures of the anilox rolls differ.

Figures 4 hows the surface structures of two different types of cells, where figure 14 a is a UniCorr roll and 14 b is an anilox roll 355 l/cm with hexagonal cells.

There is also a banded roll with six bands of different screen ruling and nominal cell volume: 276 l/cm, 6.0 cm3/m2; 276 l/cm, 5.0 cm3/m2; 315 l/cm, 4.5 cm3/m2; 355 l/cm, 4.0 cm3/m2; 355 l/cm, 3.5 cm3/m2 and 400 l/cm, 3.0 cm3/m2

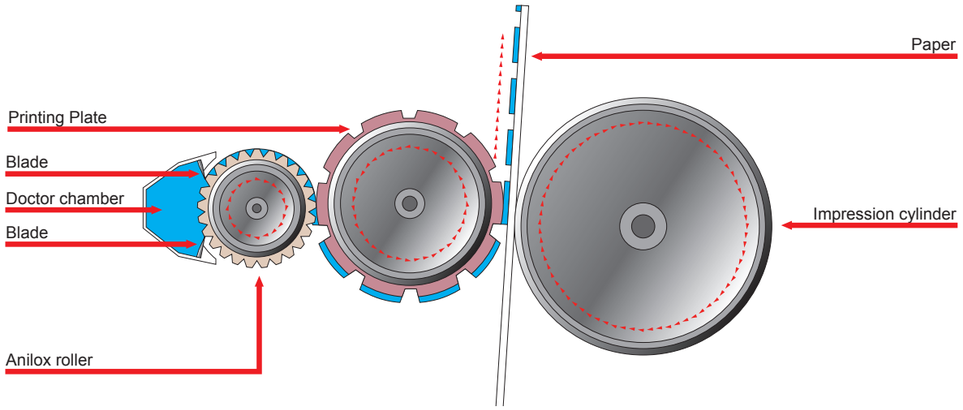

Figure 3. The major components in ink transfer using the flexographic central impression cylinder printing.

An example is an anilox roll with 120 l/cm and a nominal ink capacity of 8 cm3/m2. The cell count/cm should be 4-5 times greater on the anilox roll than the cell count on the printing plate to print a dot as small as 4 %. Generally the anilox has a core of steel, which can be plated with a thin layer of chromium or it can be coated with ceramic. For printing on a variety of substrates, Broby Grafiska has a range of anilox rolls. The rolls are arranged in Table 4.

Apart from the autoclean system in the press, the rolls are cleaned in a separate anilox roll wash (Anilox roll Cleaner FW 2000M, Jet Technologies, Australia) using one part water and one part washing solution (FW Anilox + Cleaner, Skødstrup, Danmark) and in one MicroCleanTM Anilox Cleaning system (Flexo Concepts, Mooresville, NC, U.S.A), which uses small plastic pellets for that removes dried ink from the anilox.

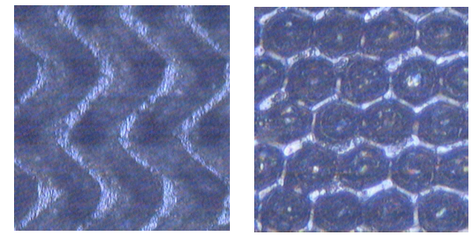

Figure 4. Surface structure for UniCorr and b) anilox roll 355 l/cm at 100 times magnification

Plate-making

The process for making a flexographic plate involves a number of stages when forming the print layout (Figure 5). These could be: back exposure, main exposure, thermowashing, drying and stabilization, post-exposure and light-finishing.

Figure 1 shows the process for exposure of printing plates at Broby Grafiska. The plate-making is performed digitally (CDI Spark 4835, Esko Artwork, Belgium). The maximum format of the printing plate is 900 × 1200 mm. The plates are exposed in an exposer unit (DuPont Cyrel 1000 EC/LF, DuPont, Frankfurt, Germany), in which has an integrated plate "dry washer" (CyrelFAST 1000TD (DuPont, USA), where the unexposed parts of the plate are removed in an apparatus equipped with a long felt.

The felt and the plate come into contact at a raised temperature (162°C) under UV- and IR-radiation, and the unpolymerized material attaches to the felt and is transported and wound around a cylinder. This technique removes the "traditional steps" in photochemical printing plate process such as; washing, drying and stabilization stages. This makes the thermodry process both environment-friendly, through the elimination of washing solvents, and less time-consuming than the photochemical process.

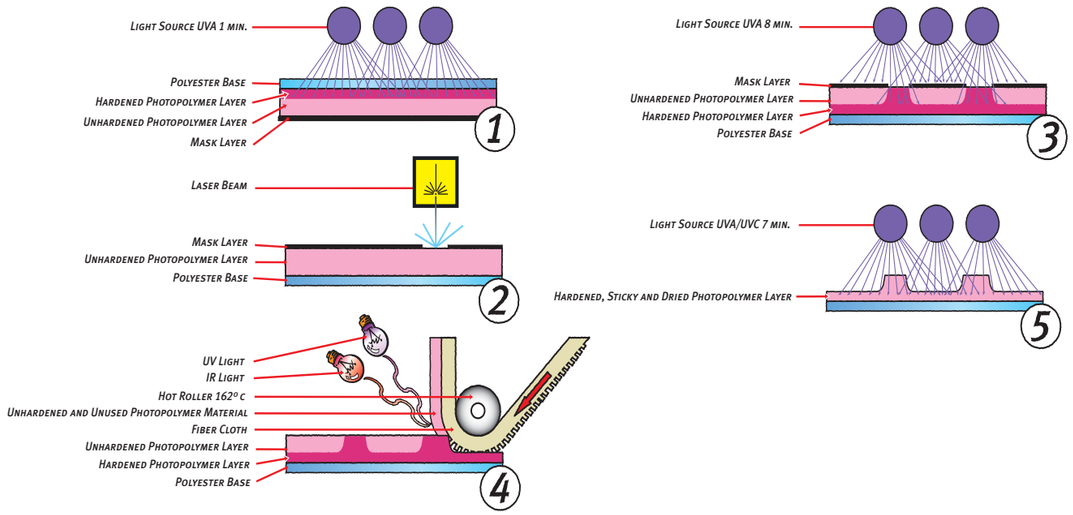

Figure 5. Example of the process of preparing a digital flexographic printing plate.

Inventory

Software	**Version**
Photoshop	CS4
Illustrator	CS4
InDesign	CS4
Acrobat Professional	9.2
ArtiosCAD	7.40en
PackEdge	Suite 10
DeskPack for Illustrator	Suite 10
DeskPack for Photoshop	Suite 10
Studio Toolkit for Boxes	Suite 10
Studio Toolkit for Flexibles	Suite 10
Visualizer	Suite 10
Cinema 4D	10.5

Machine	**Control Systems**
Kongsberg XL20	XL-Guide v6030
Dimension SST	Catalyst EX 4.1.32
Fujifilm Acuity Advance	HD-2545W
Roland Versa-UV	LEC-300

Software	**Version**
Backstage	Suite 10
Odystar	4.0.4
PowerSwitch	PowerSwitch 08 upd 7
Flexrip	Suite 10
PlatePrep	Plateprep 10.0.2
Colorproof XF	4.1.2
Colorgate	Productionserver5 Ultimate
ProfileMaker Pro	5.0.8
Colornavigator	4.2
Blue Eye Pro	1.0

Machine	**Control Systems**
DTP-70	
i1-Display v2	
CM-700D	
Designjet 1050c plus	
Stylus Pro 9880	
Spark 4835	Grapholas 7.5 build 5
Cyrel Fast 1000TD	
nylonflex Combi L FII	
nylonflex Combi L FII	

Machine	**Control Systems**
smartGPS	
6S-8	Eltromat Webvideo 3000
Rotova 300	
NT Flexo Plate Cleaner	
FW 2000 M	
Microclean Flexo Concepts	
Mount O Matic 1300 DD ECO	
FlexoCAM v6.4-0099	FlexoCAM Plate 3.0.3
AniCAM v6.4-0100	AniCAM 2.1.6

Machine	**Control Systems**
Eizo Color	Edge CG19
LaCie	724 LED

Machine	**Control Systems**
PG-3	version 3.1
ECOCELL 55	
APX-200	
APX-4001	
Elrepho 12607, 17080	
BS61 no. 2231	Shore A, Shore D
DM-0654	
SMZ-140	
B3 Professional series	
Type 102 BA 400	
MoticCAM 2300	3.0 MP Live resolution
Scott bond	
typ 141	
ST60 Pro Plus	
Protek 506	
Mätman	
IrDa-unit	
JCI 140 Static Monitor	
pH97Wp	
TES-1380	
TES-1316	
IR-200	
MSH Basic	
Leica CLS 50X	
H10KT	
STFIMottling Expert v. 1.0	
Digital lux meter LX-101	
Echocel JuniorTM	Anilox rolls 100-500 l/cm

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