Gravure, the decisive plus of sheet-fed printing

• H. C. Moog is a family owned medium-sized company founded in 1950 by Henry Cornelius Moog.

• For over 60 years the special focus of our family-owned company has been on the development and design of single-colour and multi-colour sheet-fed gravure presses.

• Moog has a team of specialists with an in-depth knowledge of worldwide service, erection and in-house training.

• Moog produce sheet-fed gravure presses “Made in Germany”
Premium sheet-fed gravure printing is covering the entire range of gravure inks like water-based, UV, conventional gravure inks and functional inks for the folding carton industry in the field of beauty, confectionary, premium liquor, pharmacy, tobacco and security printing.

Print enhancement in sheet-fed gravure and in combination with other sheet-fed processes

Blind embossing into the front side, structure graining of paper and board.
Micro embossing for brand protection and information as well as security (Hidden Images)

Paper, carton board and synthetics
75 g/m² up to 600 g/m²

Multi-pass technology gives the ability up to 3 repeat passes.
In the new sheet drying concept Moog has gone into a new direction. The drying sections with frequency controlled high speed air knifes and adjustable heating cartridges, as well as IR and UV, can now be optimized for any substrate and ink film thickness for most effective energy savings. The heat recovery system use again the energy for heat up the drying air.

The most important issue of this effective drying is the stress free drying of the substrate. Therefore Moog use a long drying section, with cold and warm drying sections to avoid shrinking or expanding of the sheet.
Gravure is characterized as a direct printing process producing an exact ink film on the substrate. The ink volume/thickness of ink film is controlled by the engraved cells on a gravure cylinder. A doctor blade removes excess ink from the surface of the cylinder only providing ink transfer out of the engraved cells.

A viscosity control unit determines the consistency of the ink. This assures a 100% stable ink transfer over the complete print job.

This is the principal reason for exceptional print stability over a wide range of applications practically unaffected by other process variables. Since each new product requires new cylinders or a new printing plate, cell configurations can be optimized for the substrate and the ink characteristics such as pigment size so that no unknown parameters can influence the final high product quality which results in a minimum amount of wastage.
The special designed ink pans are made for best mixing of the ink and covering the solvent in the ink pan area for less solvent consumption. Now a total of 4 types are available for different ink amounts.

The variable doctor blade system provide different angles onto the printing cylinder. Doctor blade oscillation speed can be controlled from the control console, also according to the printing speed of the machine fully automatically.

The ink supply can be chosen from the ink overflow or from the two bottom input connections.
Pure Gravure →

- Colour brilliance and process stability
- High net output
- Minimum wastage
- Overall stable production process
- Environmental friendly
- Short make-ready time
## Overview Printing Runs

### Print Phase 1
**Gravure (Moog)**
- Site A
  - 1. Iridine 103 Rutile Sterling Silver 10-60 µm rutile
  - 2. Iridine 6103 Icy White 5-40 µm rutile
  - Combination of pigments for Security Infra Red Light
  - 3/3a (40%) Iridine 323 Royale Gold Satin 5-25 µm / (60%) Iridine 325 Solar Gold Satin 5-25 µm
  - 4. Primer
  - 4a. Metallure Silver

### Print Phase 2
**Offset Conventional (TSO)**
- Site B
  - 5. FC Black
  - 6. FC Cyan
  - 7. FC Magenta
  - 8. FC Yellow
  - 9. VHD Orange
  - 10. VHD Blue
  - 11. Varnish

### Print Phase 3
**Offset UV Drying (TSO)**
- Site A
  - 12. PMS 1817 Dark Red
  - 13. Process Blue
  - 14. PMS 185 Red
  - 15. PMS Yellow 012
  - 16. PMS 347 Green
  - 17. PMS 2665 Violet

### Print Phase 4
**Offset UV Drying (TSO)**
- Site A
  - 18. FC Black
  - 19. FC Cyan
  - 20. FC Magenta
  - 21. FC Yellow
  - 22. PMS 021 Orange
  - 23. PMS 2718 Blue

### Print Phase 5
**Offset (TSO)**
- Site A
  - 24. Glue
  - 25. Bronze Rich Gold
  - 26. Varnish / Primer

### Print Phase 6
**Offset (TSO)**
- Site A
  - 27. Luxor GTS Premium 455 Gold/Silver Satin
  - 28. Light Line SB Dots AL Gold/Silver Glossy
  - 29. Alufin GTS Premium 376 Transparent Glossy
  - 30. Colorit V949

### Print Phase 7
**Hot Foil (Hensen)**
- Site A
  - 31. Luxor GTS 307 Red Glossy
  - 32. Colorit V949 Transparent Glossy
  - 33. Luxor HC 302 Dark Blue Glossy
  - 34. Luxor GTS 391 Light Blue Glossy
  - 35. Luxor GTS Premium 455 Gold/Silver Satin
  - 36. Luxor GTS 307 Red Glossy

### Print Phase 8
**Hot Foil (Hensen)**
- Site A
  - 37. Luxor GTS 307 Red Glossy
  - 38. MP 102566 Red Satin
  - 39. Hologram
  - 40. Light Line SB Dots AL Pink
  - 41. Luxor GTS 362 Black

### Print Phase 9
**Hot Foil (Hensen)**
- Site A
  - 42. Mirafol Silver

### Print Phase 10
**Hot Foil (Hensen)**
- Site A
  - 43. Debossing

### Print Phase 11
**Debossing (TSO)**
- Site A
  - 44. Embossing

### Print Phase 12
**Embossing (TSO)**
- Site A
  - 45. Die Cutting & Creasing

---

Tilburg, 02 September 2011
Multi Passes in Pure Gravure or Combination Printing

Keywords:
Varnish; Spot Varnish; Soft-touch Varnish; Soft-tactile varnish; OPV; High-relief printing; tactile printing; mock-up printing; prototype printing; hot calendaring varnish; all kind of metallic and pearl inks; functional inks and varnishes; water, solvent and UV; Continuous tone printing, refinement, print enhancement; finishing and varnishing, full- and part blind embossing, stray graining, micro embossing; full- and part-coating, lacquering. Graphic art prints, Matchbox side friction printing.

Sheet-fed gravure means that a cost efficient and reliable printing production is guaranteed. Repeat runs are register true. Pre-printing of gold/silver/pearlescent in gravure for further processing in sheet-fed offset provides a valuable feature for combining quality with a cost effectiveness. In addition varnishing and coating in gravure in precise determined layers provides for an exact calculation of the final printing product.
nyloprint® photopolymer plates for sheetfed gravure printing are cost-effective and meet highest quality demands.

Easy, fast and reliable plate processing as well as premium print quality are the key benefits of nyloprint® gravure plates. Exceptional metallic-gloss and brilliance of metallic inks are the basic requirements for sheet-fed gravure printing.

Highest print quality
Brilliant halftone gradations and very smooth vignettes
Very high resolution – up to 10.160 dpi
Excellent solid density due to brilliant ink transfer
Reliable reusable for repeat runs
Cost effective and environmentally friendly
Processing of nyloprint® Printing Plates

Raw Plate → Imaging → UV-Exposure → Washout, Drying, Post Exposure

conventional nyloprint® plate

Digital nyloprint® plate

Laser
### nyloprint WSA 52 Digital im Bogentiefdruck

Vermessung der Napfchentiefen (Verarbeitung bei Fa. Danecke)

<table>
<thead>
<tr>
<th>Belichtungszeit 5 min</th>
<th>60 L/cm</th>
<th>70 L/cm</th>
<th>80 L/cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>4 µm</td>
<td>4 µm</td>
<td>4 µm</td>
</tr>
<tr>
<td>20%</td>
<td>13 µm</td>
<td>11 µm</td>
<td>9 µm</td>
</tr>
<tr>
<td>40%</td>
<td>21 µm</td>
<td>16 µm</td>
<td>14 µm</td>
</tr>
<tr>
<td>50%</td>
<td>24 µm</td>
<td>16 µm</td>
<td>14 µm</td>
</tr>
<tr>
<td>100%</td>
<td>51 µm</td>
<td>43 µm</td>
<td>36 µm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belichtungszeit 10 min</th>
<th>60 L/cm</th>
<th>70 L/cm</th>
<th>80 L/cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>6 µm</td>
<td>5 µm</td>
<td>n. m.</td>
</tr>
<tr>
<td>20%</td>
<td>8 µm</td>
<td>6 µm</td>
<td>4 µm</td>
</tr>
<tr>
<td>40%</td>
<td>13 µm</td>
<td>14 µm</td>
<td>10 µm</td>
</tr>
<tr>
<td>50%</td>
<td>21 µm</td>
<td>17 µm</td>
<td>12 µm</td>
</tr>
<tr>
<td>100%</td>
<td>48 µm</td>
<td>39 µm</td>
<td>34 µm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belichtungszeit 15 min</th>
<th>60 L/cm</th>
<th>70 L/cm</th>
<th>80 L/cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>n. m.</td>
<td>n. m.</td>
<td>n. m.</td>
</tr>
<tr>
<td>20%</td>
<td>4 µm</td>
<td>4 µm</td>
<td>5 µm</td>
</tr>
<tr>
<td>40%</td>
<td>13 µm</td>
<td>11 µm</td>
<td>10 µm</td>
</tr>
<tr>
<td>50%</td>
<td>16 µm</td>
<td>14 µm</td>
<td>12 µm</td>
</tr>
<tr>
<td>100%</td>
<td>27 µm</td>
<td>20 µm</td>
<td>19 µm</td>
</tr>
</tbody>
</table>

(n. m. = nicht messbar)
A new developed Moog image carrier, for the easy use of photopolymer printing and embossing plates enables the printer in addition to re-use a plate.

The clamping mechanism works over the entire cylinder width for a most even traction.
A plate for blind embossing can be prepared digitally, so that many designs can be realized. The fast and independent preparation of a plate enables a more flexible use for the embossing-print in a gravure station. Also conventional forme cylinders have a fixed size, no matter the repeat size of the printed package.
3-dimensional debossing results are possible with a sheet-fed gravure press, because a cylinder is used in which line embossing requires less pressure for transmission than a flat bed embossing machine. Stray graining over the whole sheet is often used in the beauty- and tobacco-industry to present a high quality and eye-catching product at the „point of sale“. 
Micro Embossing (Hidden Images)  

Varnishing of security prints
Sheet-fed Gravure for the sustainable alternative instead of foiling

UV-based high gloss silver

conventional high gloss silver
Summary

- Colour brilliance and process stability
- High net output
- Minimum wastage
- Overall stable production process
- Environmental friendly
- Short make-ready time
- Multi-colour presses for complete gravure production
- Single colour presses for all kind of print enhancement
- UV, IR, high speed air knife, hot air knife
- Electrostatic print assist
- Economical format 740 mm x 1040 mm
- Print medium from paper to cardboard and synthetics
- Production speed up to 12,000 sheets/hour
- High-pile nonstop-feeder and -delivery
- Clamping cylinder for gravure plates
- Best printing results on low quality cardboard
- Metalized and laminated substrate can be substituted
- Fast change-over times between the jobs
- Print job manager (open data base)
- External software service modem
SINGLE UNIT AND MULTICOLOUR SHEET-FED GRAVURE PRESSES

AND OUR NEW MULITALENT 1-TBR COMPACT 740/1040

- Production speed up to 12,000 sheets/hour
- Economical format 740 mm x 1040 mm
- Multicolour presses with up to eight units
- Premium gravure printing in the field of cosmetics, confectionery, perfumes, pharmacy, labels, tobacco, beverage, food industry as well as mock-up models and prototypes

H. C. MOOG GmbH Germany
Maschinen für Druck und Papier
65385 Ruedesheim am Rhein
56357 Miehlen im Taunus
fon: +49 (0) 67 22-90 00-0
www.hcmoog.de
hcmoog@hcmoog.de

Thank you for your attention!