UV curable flexo inks suitable for use in narrow web printing for label and packaging applications. This information will enable the printer to achieve the best print results and optimise the process from the range of GREENCORP UV flexo inks.

GREENCORP UV - RANGE OF UV FLEXO INKS BY APPLICATION:

**FREE RADICAL SERIES**
- GENERAL LABEL STOCK
- LOW ODOUR & ITX FREE
- SHRINK SLEEVE
- LOW MIGRATION FOR FOOD PACKAGING

**CATIONIC SERIES**

**OTHER PRODUCTS OF GREENCORP UV-**

OVER PRINT VARNISHES – FLEXO / ROLLER / SCREEN
LAMINATING ADHESIVES
PRIMER

Substrates
UV flexo inks have adhesion to a wide variety of papers, boards and plastic films:

- Coated & uncoated papers and boards
- Coated thermal papers
- In mould labels
- Wrap around labels (BOPP, Paper)
- Metallised polyesters and papers
- Polypropylene
- Polyethylene
- Polyester
- Acrylic and PVdC coated films
- PVC
- Polystyrene

We strongly recommended in-line corona treatment of plastic substrates to ensure an optimum treatment level of 38-44 dynes/cm. The surface energy of plastics may deteriorate in time causing poor ink adhesion and we recommend that the surface
energy be checked with a proprietary test pen before printing. Where low surface energy is detected corona treatment may help improve adhesion. The use of a suitable primer may give further adhesion improvements. Highly absorbent substrates including some grades of paper and board can reduce the curing efficiency of UV flexo inks.

Print finishing
All GREENCORP UV flexo inks can be in-line over varnished to give higher gloss and additional abrasion resistance. Suitable products are available for a wide range of end use applications from our range of GREENCORP UV OPV varnishes. GREENCORP UV flexo inks may be laminated using our GREENCORP UV curable laminating adhesive.

GREENCORP UV flexo inks can be hot or cold-foil blocked. For cold foil blocking we recommend our cold foil blocking adhesive.

The quality of adhesion of film and foil to print should be tested before commencing a full print run. For each new application we recommend making a preliminary test before embarking on a full print run.

Machines
GREENCORP UV flexo inks are designed for use on all types of narrow-web flexo presses equipped with inter-deck UV lamps and appropriate metering systems, including open pan and chamber doctor blade configurations. The maximum press speed achievable will depend upon a number of factors including the number and power of the UV lamps in use and the quality and surface characteristics of the substrate.

Application advice:
Ink handling
Where automatic ink feed is used this should be from enclosed containers using peristaltic pumps. All joints, seals and hoses should be opaque and made from materials resistant to UV materials. To reduce foaming in circulation systems ensure that the return level is below the ink surface in the reservoir.
To prevent premature polymerisation, ink reservoirs, ducts, and rollers should be not be exposed to direct or filtered sunlight. Ink polymerisation can also occur under levels of high heat and shear.

UV lamps
UV lamps radiate some infrared, so lamp reflector housings should be cooled to limit possible damage to the printed web by heat absorption.
Ink viscosity
UV flexo inks have a higher viscosity than solvent-based or water-based inks. This will assist in reducing dot gain and improve print quality. Viscosity is very sensitive to temperature fluctuations. A constant temperature will maintain consistent ink transfer, print density and final print quality. Heated chambers, aniloxes and reservoirs/ducts can be used to control ink viscosity.

Colour sequence
Dark colours, especially black, are more difficult to cure than other colours. White is also difficult to cure due to its opacity. We recommended printing darker colours towards the beginning of the colour sequence to ensure efficient curing, unless there is a risk of build-up of heat in the substrate.

Additives
GREENCORP UV flexo inks are supplied ready for use. Where adjustment is required please contact our technical services for advice on suitable additives.

Aniloxes
Ceramic aniloxes metered with a chamber or a reverse-angle doctor-blade are normally recommended. UV inks are solvent-free so both the applied and dry film weights are equal. The anilox volume required is therefore smaller than that normally used for conventional flexo inks. This allows the use of finer line screens giving lower ink film weight and improved print quality. We recommend completing trials to identify the optimum anilox specification for the required print density.

Typical anilox dimensions:

<table>
<thead>
<tr>
<th>Ink type</th>
<th>Screen lines per cm</th>
<th>Cell volume cm³/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>250 to 600</td>
<td>2.3 to 4.0</td>
</tr>
<tr>
<td>Line or type</td>
<td>120 to 200</td>
<td>4.0 to 7.0</td>
</tr>
<tr>
<td>Solids</td>
<td>100 to 160</td>
<td>7.0 to 9.0</td>
</tr>
<tr>
<td>Backing white</td>
<td>80 to 120</td>
<td>10.0 to 15.0</td>
</tr>
<tr>
<td>Metallics</td>
<td>100 to 160</td>
<td>9.5 to 11.0</td>
</tr>
<tr>
<td>Varnishes</td>
<td>60 to 120</td>
<td>8.0 to 13.0</td>
</tr>
</tbody>
</table>

GREENCORP UV flexo 4-colour process inks are designed for anilox cell volumes of between 3.0 and 4.0 cm³/m² and line screens of up to 350 lines/cm.

Plates & rollers
GREENCORP UV flexo inks are suitable for use with all UV compatible photopolymer plates. All adhesives, sealants and metering rollers must also be resistant to UV materials. The choice of plate can have a significant effect on printability. We advise contacting plate suppliers for their recommendations.
GREENCORP UV flexo inks can be used with suitable grades of computer-to-plate or digital plates. These can provide higher print definition and are recommended for the highest quality 4-colour process printing.

Backing tapes
The choice of backing tape is a significant contribution to top quality printing. We recommend:

Hard vinyl, on suitable machine configurations, for backing whites and other large solid areas where fine detail is not required, high-density cushion tapes where vinyl tapes cannot be used for large solid areas, medium density cushion tapes for line and type work, for solids with reversed-out lettering and where printing a combination of process and solid work. Low-density cushion tapes for high quality process printing.

Wash up
GREENCORP UV flexo inks can be removed from contaminated surfaces without the use of solvent, as the inks do not dry without UV light. Selected detergent-based washes or proprietary products can be used as a final wash. Existing techniques can be used for the disposal of used wash-up, taking into account regulations in force.

Storage
GREENCORP UV flexo inks are stable for at least twelve months in their original packaging when stored at temperatures between 5°C and 25°C, and protected from direct sunlight. Careful stock rotation is recommended. Uncontaminated press returns can be stored under the same conditions as unopened inks and should be reused within three months of the original delivery date.

Health, safety and environment
GREENCORP UV inks should be used under controlled conditions respecting normal standards of industrial hygiene and taking into account the information provided on product labels and in our product Material Safety Data Sheets MSDS (available on request). Printing inks, varnishes and contaminated residues should be disposed of in accordance with local and international regulations in force.

Resistances
The pigments used in GREENCORP UV flexo inks are not necessarily fully resistant to all post printing conditions that may be encountered. It is therefore necessary to indicate the resistance required at the time of ordering.

To ensure the maximum resistance to solvents and other liquids we recommend that the printed ink be protected with an appropriate UV curing varnish.