### TECHNICAL DATA SHEET

**Range name:**

**TEMPO NUTRISTAR**

**Description:**

Litho sheet-fed inks for food packaging applications. This series allows to guarantee excellent runnability with low odour level and controlled migration.

Except the pigments, **TEMPO NUTRISTAR** inks are composed of vegetable based components. This concerns part of the resins, vegetable oils and derivatives. Inks are formulated without raw materials containing petroleum distillates like mineral oils or any other hydrocarbon solvents.

The series is also free of any dryer.

This series is presenting excellent deinkability properties. (score ERPC to the INGEDE test 11 >95).

**Application Fields / Market:**

Primary and secondary food packaging jobs needing low residual odour and/or controlled migration.

**Product safety:**

**Intended Use**

Food packaging (incl. pharma and hygiene): YES

**Compliance Management**

These inks are only suitable for use on the non-food-contact side of food packaging, provided that they are applied using the relevant Good Manufacturing Practices (a system for ensuring that products are consistently produced and controlled according to quality standards) and according to the guidelines in this Technical Data Sheet. The printer, converter and the packer/filler each have a responsibility to ensure that the finished - printed - article is fit for the intended purpose(s) and that the ink and coating components do not migrate into the food at levels that exceed legal, regulatory and industry defined requirements.

Please refer to Siegwerk’s “Statement of Composition” for further regulatory information.

In case of specific applications, please contact your technical application service.


➢ In particular, **TEMPO NUTRISTAR** products represent a new generation of inks exclusively formulated with selected components, so as to both minimize potential migration of concern through the substrate and the set-off from the printed outer side to the food contact surface in the stack or the reel.

➢ **TEMPO NUTRISTAR** formula does not contain the following:

- Basic dye complex (“fanal”) pigments and barium-organic pigments with high bleeding tendency,
- Mineral oils
- Alkylbenzenes
- Hydroquinone and ketoxime antidriers
- Cobalt driers

With this advanced design, a high degree of ink-side safety is provided, enabling the converter to produce packaging, which is minimized in sensory impact and migration of concern according to today’s standards.

Note that set-off and migration are dependent on the processing conditions such as thickness of the ink layer, colour and sufficient barrier properties of the substrate. Particular consideration for these parameters, and for the selection of non-bleeding ink references with resistant pigment, is required in case of demanding areas such as packaging for:

- organoleptically sensitive foodstuffs in general
- liquid or pasty, fatty and/or aqueous or acid food paste or solid fatty food
In case where an overprint varnish is not applied, it is recommended to add a specific additive in order to increase the rub resistance (see this chapter at the end of the data sheet).

For specific applications needing to place the print in a thermal oven or in a microwave oven, please refer to the below fastness table and use only colours marked with a “Yes” for this applications.

For toy applications, please contact our technical department.

You will produce a safe packaging material if you observe good printing practices and restrictions as outlined in the Customer Guidance and the Good Practice Guide mentioned above. In particular, these inks are not approved for direct contact with food, separated from it or not by a varnish layer.

Please contact us if you plan to produce place mats.

Substrates:

All types of board recommended for folding boxes for food packaging applications. Coated or uncoated papers for wrapping applications, place mats or inserts

Features - Performances:

- **ON THE PRESS SIDE**
  - Very easy to use: able to run as well as a conventional ink
  - Suitable for all dampening systems with or without alcohol
  - High speed runnability
  - Inks remain stable on the rollers
  - Duct fresh overnight

- **ON THE PRINTING SIDE**
  - Very low residual odour, Robinson level ~1
  - Optimized migration
  - Very high colour intensity
  - Fast setting
  - Excellent level of chemical and physical resistance
  - Over printability (see fastness on the next pages)
  - For a good rub resistance, it is recommended to apply an overprinting varnish, see VARNISHING

Warning:

- The use of an IR drier or warm air will improve the setting and the gloss but it is recommended to respect 30°C maximum in the stack.

- These inks have a shelf life of 2 years from the date of production. This has to be interpreted as a warranty of “the best use” concerning the printing properties of the inks, providing the cans are not opened and stored at room temperature.
  After this date the inks are still usable on the press but their printing properties could eventually be altered in terms of transfer, trapping, optical density and to a certain extend in term of shade by consequence of the transfer.

- In any case, neither the food packaging compliance of the inks nor the risks of cross-contamination become an issue after the end of the expiry date. The compliance of the inks with the food safety requirements remains unaltered.
The range:

**PROCESS INKS**

<table>
<thead>
<tr>
<th>Colours</th>
<th>Reference numbers</th>
<th>Water based varnishing</th>
<th>IWS (1)</th>
<th>Alcohol</th>
<th>Solvent</th>
<th>Alkali</th>
<th>Lactic acid</th>
<th>Butter</th>
<th>For Microwave(2)</th>
<th>For Baking oven (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow ISO 2846-1</td>
<td>60-311903-3</td>
<td>Yes</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Magenta ISO 2846-1</td>
<td>60-824627-8</td>
<td>Yes</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Cyan ISO 2846-1</td>
<td>60-129663-5</td>
<td>Yes</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Black ISO 2846-1</td>
<td>60-917304-2</td>
<td>Yes</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

We do not recommend to use above process inks for mixing system.

Process colours of the **TEMPO NUTRISTAR** series are meeting the specifications of the ISO 2846-1:2006(E): « Graphic technology – colour and transparency of inks sets for four-colour printing.»

1. These light fastness values refer to a solid tone printing. Light fastness decreases when colour strength is reduced or if colours are intermixed.

2. Ink references which are not suitable bring about the risk of pigment migration caused by its partial dissolution at foreseeable thermal exposure such as up to 140°C during 30 min.

If however the intended and foreseeable use involves higher thermal exposure (such as packaging for food explicitly intended for intensive grilling in dual microwave/grill ovens), the printer shall select reference numbers suitable for baking oven. Where susceptor board or film is used in the package, areas adjacent to the susceptor can have temperatures over 200°C. In these cases, as well, only reference numbers suitable for baking oven must be used.

3. Ink references which are not suitable bring about the risk of pigment migration and/or decomposition to undesirable substances at baking oven temperatures. For ink references which are suitable, representative tests demonstrate, up to 220°C/80 min, no perceivable risk for transfer of recognized harmful substances.

For Metallic inks please refer to the TDS **TEMPO NUTRIPACK METALLICS**

**Varnishing:**

In order to avoid set-off and rub resistance issues, we recommend to apply a low residual odour and low migration varnish:

- **WATER BASED VARNISH:**
  - Gloss varnish : 10-602160-3 / 15SI041795
  - Matt varnish : 15-600466-5 / 15SI041796
  - The mixing of these varnishes is possible to obtain a semi matt effect.

- **VEGETABLE BASED OFFSET OVERPRINT VARNISH NUTRIPACK 2:**
  - Gloss varnish : 65-600585-7
  - Matt varnish : 65-600586-5
Auxiliary printing additives:

When certain substrates or machine conditions imply adjustments of the ink properties, the additives should be chosen in function of this substrate and of the further processing of the printed matter.

<table>
<thead>
<tr>
<th>Role</th>
<th>Designation</th>
<th>Reference numbers</th>
<th>Proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinner</td>
<td>Vegetable Diluent</td>
<td>61-470079-7</td>
<td>1 to 3%</td>
</tr>
<tr>
<td>Tack reducer</td>
<td>Tack reducer</td>
<td>61-470080-5</td>
<td>2 to 4%</td>
</tr>
<tr>
<td>Anti-friction paste</td>
<td>Hardener</td>
<td>61-470296-7</td>
<td>2 to 5%</td>
</tr>
<tr>
<td>Fountain additive</td>
<td>AQUA FOOD</td>
<td>65-060012-5</td>
<td>4 to 6%</td>
</tr>
<tr>
<td>Cleaning product</td>
<td>Food Packaging cleaner</td>
<td>65-650141-8</td>
<td>pure</td>
</tr>
</tbody>
</table>

Packing size:

- ✓ Vacuum Metallic Tins: 2.5 kg
- ✓ Bigger packing on demand: (25 kg – 200 kg)

This information is based on our experience and on results obtained in the laboratory, using specific processes and types of application. In view of the diversity of substrates and printing conditions, this data is communicated for information purposes only and is provided without any warranty on our part and must be authenticated by industrial tests before the products are used. Improvements are being made to our products on an ongoing basis and we therefore reserve the right to modify their composition as well as the contents of our technical data sheets. We disclaim any liability for applications for which this ink series is not foreseen. These products are only suitable for use on the non-food contact side of food packaging, provided they are applied under the relevant Good Manufacturing Practices (GMP) and according to the information in this Technical Data Sheet. The printer, converter and packer/filler have the legal responsibility to ensure that the finished article is fit for the intended purpose and that the ink and coating components do not migrate into the food at levels that exceed legal and industry requirements.