ACRYLAC®
Gold and Silver inks

System description

ACRYLAC® gold and silver inks open up new possibilities for decorative effects on packages and brochures and have managed to establish themselves in the market. It is now very difficult to imagine the packaging sector, in particular cigarette and confectionery packaging, without them.

The high brilliancy of ACRYLAC® products is achieved by using specially developed metallic pigments. ACRYLAC® Gold is based on powdered brass; ACRYLAC® Silver and ACRYLAC® Alu-Gold contain a variety of aluminium pigments. High-transparency, high-intensity pigments are used in ACRYLAC® Alu-Gold to achieve the golden hue.

Printing characteristics

ACRYLAC® gold and silver inks are similar to dispersion varnishes in terms of vehicle formulation, and therefore have similar performance characteristics. They dry quickly by absorption or by evaporation of their water component. During the drying process, the specially configured compatibility between the vehicle and the metallic pigment bestows upon the pigment an optimum plane-parallel orientation, which in turn results in the outstanding gloss effect.

Unlike the oxidative-drying vehicle systems in conventional offset bronze inks, which emit a characteristic ‘offset odour’ as they dry, ACRYLAC® gold and silver inks are based on an aqueous vehicle system. The organoleptic values of these inks, as measured by Robinson tests, are comparatively low, and the inks are therefore particularly suitable for decorative effects on food and cigarette packages.

Special measures must be taken when working with ACRYLAC® gold and silver inks.

We particularly recommend using these inks on offset presses equipped with a double-varnishing unit. The substrate should be coated with a dispersion varnish as a primer varnish.

Application instructions

ACRYLAC® Gold (2-component)

These inks are supplied as two-component systems consisting of pigment paste and vehicle.The separate components have a shelf life of at least 6 months.

Inks can be mixed with simple equipment, such as an electric drill with a mixer attachment.

First disperse all of the pigment paste with approx. a quarter of the vehicle, stirring for approx. 10 minutes until a smooth, homogeneous consistency is obtained. Then add the rest of the vehicle in portions, and stir slowly for another 5 minutes.

The mixed product should be used within 6 weeks. A bluish tint on the surface of the ink will not affect brilliancy, but the ink must always be stirred again before use. If the ink has already been on the press, it must be used up as quickly as possible. Eliminate any air bubbles from mixed ink batches before storing them. Lay a sheet of film on the surface of the ink in the storage container to seal it.

ACRYLAC® Gold inks are also available as one-component systems. One-component inks should be used within 6 weeks; loss of brilliancy may occur thereafter.

ACRYLAC® Silver and Alu-Gold

These inks are supplied as one-component systems and are ready to use. They should be used within 3 months. If the ink has already been on the press, it must be used up as quickly as possible.

Once opened, ACRYLAC® Silver and Alu-Gold must not be stored in tightly sealed containers, since the ink may release small amounts of hydrogen.

To determine viscosity exactly, we recommend that you use a 4-mm flow cup (formerly DIN 53 211).

Drainage time with a 4-mm DIN cup is approx. 40 – 60 s for ACRYLAC® Gold and Silver (approx. 80 –100 s for Pale Gold). A total of up to 5 – 6 % water may be added to the ink in steps.

Press instructions

The ideal medium for transferring precisely metered quantities of the ink is an anilox roller with chambered doctor blade system. Depending on the cell geometry of the anilox roller, up to 50% of the cell content is transferred to the stock to be printed.

The choice of anilox roller depends on the subject and on the printing conditions, and should be made on a case-by-case basis.

In our experience, it is impossible to print a water-based gold or silver ink using a conventional varnishing unit: too much ink is transferred and fine typefaces and details block up.

In order to apply water-based gold and silver inks along with dispersion varnish in a single press pass, the press must have two application units. Two alternative printing methods can be employed with this “double varnishing unit” setup:

Method 1

The first unit applies varnish and the gold or silver ink is then applied in the second varnishing unit. The underlying varnish does not dry completely until it has passed through the second unit. The resulting bond at the interface between ink and varnish gives the product excellent rub resistance. An outstanding gold effect is also produced, since brilliance is not reduced by a varnish coating. The initial varnish coat also prevents any build-up of offset ink on the gold or silver ink polymer plate. Otherwise the low molecular-weight constituents in this offset ink would cause swelling of the polymers in the plate.

Method 2

Print the gold or silver ink in the first varnishing unit and protect the ink by covering with a varnish coat. This not only yields outstanding rub resistance, but also means that by selecting a suitable varnish, stackability can be precisely adjusted to the stock. Care must be taken that offset ink does not build up on the polymer plate of the ACRYLAC® ink.

The first method obviously offers more advantages and generally affords adequate rub resistance. In difficult cases, the specially rub resistant **Vehicle 57 2020** is used.

If the impression pressure is too high, the ink can squeeze out at the sides of the polymer printing plate. This effect causes double edges in text areas or filling-in of fine details. The impression pressure must therefore be set as low as possible (“kiss printing”).

In order to limit fluctuations in viscosity and to prevent foaming, the varnish should be stirred continuously and slowly in a vane agitator during application.

To ensure the printing process remains stable throughout the print run, the temperature of the ink needs to be controlled: the ink in the storage tank should not exceed 20 °C. A storage tank with cooling unit and built-in stirrer should be used in such cases.

The ink level in the storage tank should not drop below 20 cm, otherwise the inherent weight of the ink will not be sufficient to force the air introduced via the anilox roller upwards. We therefore recommend using a tall, narrow storage tank.

Because these ACRYLAC® inks necessitate very specific processing methods, we recommend that users consult our application engineering staff – phone +49 89 9003-327 – before using these products for the first time.

Printing plates

Photopolymer printing plates should be used for processing. A number of plate manufacturers have developed photopolymer plates on aluminium carriers. The carrier is designed to prevent the plate from expanding when clamped, ensuring precision in register for even the most demanding requirements.

Products available and formulated ink weights

ACRYLAC®	Pigment paste proportion 45 %	Vehicle proportion 55 %	Ink weight
ACRYLAC® Gold – Two-component systems			
Rich Pale Gold	**57 2502**	**57 2015***	22.5 kg
Pale Gold	**57 2602**	**57 2015***	22.5 kg
Rich Gold	**57 2802**	**57 2015***	22.5 kg
ACRYLAC® Gold – One-component systems			
Rich Pale Gold	**57 1252**		
Pale Gold	**57 1262**		
Rich Gold	**57 1282**		
ACRYLAC® Silver	**57 3000**		
ACRYLAC® Alu-Gold	**57 2455**		

* As an alternative to this product, we offer the rub resistant **Vehicle 57 2020**, which, due to its higher wax content, will produce a higher viscosity than **Vehicle 57 2015**.

Particularly in the case of mixtures with Pale Gold paste, a viscosity of approx. 100 s/4 mm DIN cup will be obtained after the mixture has been prepared. To adjust it to a printing viscosity of approx. 50 s/4 mm, it needs to be reduced with approx. 5 % water.

Ink concentrates

A range of ink concentrates can be supplied to add colour to ACRYLAC® gold and silver inks. They can be used to individually change the shade of the gold and silver inks. The following concentrates are available:

Yellow ink concentrate 57 0310
Red ink concentrate 57 0312

In the case of special colour demands, exact matching to the original should be carried out in the laboratory. ACRYLAC® gold inks containing ink concentrates can only be stored for very short periods of time as they tend to dry out on the surface. Storage over several days is not feasible!

Special instructions

An intermediate coat of varnish must be applied before printing the ACRYLAC® gold and silver inks in order to improve ink acceptance. Film inks should be used. The decomposition and Scotch tape resistance of the ACRYLAC® gold and silver inks is relatively low. Pre-production tests are essential. We do not recommend applying a UV varnish to ACRYLAC® gold or silver inks, because this results in poor scratch and Scotch tape resistance.

ACRYLAC® gold and silver inks offer good lye penetration on drinks labels. They do not, however, have the same degree of lye resistance as offset inks because the water-based vehicle dissolves totally in the softening lye. Due to the release of the bronze pigments, the lye is contaminated with copper and zinc in the case of ACRYLAC® Gold. The aluminium pigments in ACRYLAC® Silver and Alu-Gold dissolve in the lye. The colour pigments required in ACRYLAC® Alu-Gold to obtain the gold effect are alkali-fast and therefore totally insoluble. Thanks to their extremely small particle size, they are, however, suspended so effectively that the lye appears coloured.

Alcohol fastness, e.g. against the package contents, must be tested in the field. Apart from that, the gold and silver inks are not sufficiently waterproof should moisture from the atmosphere or from the water-based adhesive of the label act on them.

If the gold or silver ink becomes affected by moisture or other critical substances, this can lead to chemical reactions that have a negative effect on the brilliance of the ink. For example, you should assume that alkaline substances attack the pigments of the aluminium-based ACRYLAC® Silver or ACRYLAC® Alu-Gold ink. Likewise, substances contained in label adhesives can migrate from the reverse side through the label and react with the brass pigment of the ACRYLAC® Gold ink. You must also determine in advance if the constituents of the label adhesive cause any problems with respect to the gold or silver ink.

Acidic liquids and gases destroy the brass pigments of gold ink.

Consequently, you must ensure that all possible reactions with the gold or silver ink are investigated before you begin a large print run. This is the only way you can guarantee a high level of production reliability.

The same applies to other properties of the inks:

- lye resistance
- lye penetration time
- alcohol fastness
- condensate fastness
- wet-blocking resistance
- UV varnishability etc.

You must test whether the ink meets the requirements in the particular case in question. Apart from that, you must consider what substances can act upon the print (e.g. label) and the ink. The range of applications is so diverse that we can't go into individual cases in more detail in this information sheet. What does, however, have to be taken into consideration is, for instance:

- the substrate used
- the bottling temperature
- the bottle contents and
- sealing in film.

Heat-sealing resistance depends upon many parameters, which is why we recommend you carry out tests under field conditions in this regard.

Suitability for finishing with hot-stamping film must be tested in the field. It is dependent upon the substrate and the type of film used. The ACRYLAC® gold or silver ink may have to be overvarnished.

Heat resistance to the various tool materials (e.g. metal) must likewise be tested in the field.

When applied in line with recognised procedures, ACRYLAC® gold and silver inks are suitable for manufacturing food packaging in accordance with German food regulations. The varnishes must not come into direct contact with the packaged foodstuffs and any transfer of substances through the substrate to the package contents must be excluded. More information on the subject of food and consumables packaging can be found in the information sheet entitled 'Druckfarben für Lebensmittelverpackungen' (Printing inks for food packaging) published by the German Printing Ink Manufacturers' Association.

Pigment paste and the vehicle for ACRYLAC® Gold (2-component system) have a shelf life of at least 6 months when kept unopened in the original container. After opening the container, the products should be used up as quickly as possible. Gold inks that have been mixed ready for use have a shelf life of no more than 6 weeks.

ACRYLAC® Alu-Gold and Silver have a shelf life of at least 3 months when kept unopened in the original container. After opening the container, the inks should be used up as quickly as possible. These products can release hydrogen due to slow decomposition of the aluminium pigments. The inks should therefore never be stored in containers that seal tightly.

Always stir the inks well before application.

ACRYLAC® gold and silver inks must be stored in a dry, cool but frost-free place.

Disposal

ACRYLAC® Gold is based on powdered brass and contains copper. ACRYLAC® Alu-Gold and Silver wash water and left-over inks do not contain brass pigments. ACRYLAC® Alu-Gold does contain extremely fine colour pigment particles. Due to their copper content and the high degree to which they are discoloured by the fine-grain pigments, ACRYLAC® Gold and Silver wash water and left-over inks must be disposed of with the assistance of outside companies.

Containers that have not been properly emptied and product left-overs are hazardous waste. Empty containers must either be submitted for scrap recycling or reconditioned.

ACRYLAC® Alu-Gold and Silver can release hydrogen due to slow decomposition of the aluminium pigments. Left-over inks and wash water should therefore never be stored in tightly sealed containers. Always provide good ventilation.

Safety advice

Avoid contact with the skin and eyes. Rinse any part of the body that comes into contact with these inks thoroughly with water.

If ink splashes into your eyes, rinse thoroughly with copious amounts of water and seek the advice of a physician if necessary.

Printing auxiliaries

To clean the varnishing units, and the varnishing plate in particular, we recommend you use **ACRYLAC® Cleaner 10 T 0045** (see TI 10.9.01 E).

Classification

Code per German law on hazardous substances (GefStoffV): None

Pigment pastes 57 2502 / 57 2602 / 57 2802 only:
R-phrases: R 10 Flammable

Safety Data Sheet available on request.

How supplied

2-component system:
Th pigment paste and vehicle are supplied as separate packages in a single delivery unit. The 30-l plastic bucket (included) should be used to mix ACRYLAC® gold and silver inks for use.

1-component systems
25-kg plastic buckets

Toning inks
1-kg plastic containers