



## ALCHEMY Gold

for offset printing

### Application

Metallic-effect printing inks open up great possibilities for the design of a print job. Particularly in segments such as high-quality labels, brochures and packaging, they enable printers to create and produce excellent effects.

Gold effects are produced by using pigments based on brass, an alloy of copper and zinc. To confuse matters, people often incorrectly speak of bronzes, which would be alloys of copper and tin. The various nuances in the hues are the result of the ratio between the two components of the alloy.

Rich Gold	70 parts copper/30 parts zinc
Rich Pale Gold	85 parts copper/15 parts zinc
Pale Gold	90 parts copper/10 parts zinc
Copper	100 parts copper

Alternatively, one can also use aluminium-based pigments in combination with suitably coloured pigments, with the share of the coloured pigments, with the share of the coloured pigment determining the actual colour shade obtained (reddish/yellowish). The metallic character of these variants, however, is not as good as that achieved with the above-mentioned brass-based pigments.

### One-component inks

The advantage of one-component inks is to be found in their uncomplicated handling, because there is no need for labour- and time-intensive mixing of gold paste and varnish as is the case with two-component systems. In developing our ALCHEMY product range, we have succeeded in bringing their printability and the metallic effect obtainable up to the same high standard as that of two-component inks. When using one-component inks, you must bear in mind the fact that the metallic effect can alter if the ink is stored for a longer period. That said, by matching a great improvement in this respect compared with other metallic-effect products already on the market.

We recommend the following one-component gold inks for sheet-fed offset:

One-component Gold	Sales code	Fastness properties per ISO 12040 / ISO 2836			
		Light BWS	Alcohol	Solvent mixture	Alkali
ALCHEMY Rich Gold	46 A 2000	8	+	+	-
ALCHEMY Rich Pale Gold	46 A 2100	8	+	+	-
ALCHEMY Pale Gold	46 A 2200	8	+	+	-

and the following PANTONE metallic decorative inks as one-component gold:

One-component Gold	Sales code	Fastness properties per ISO 12040 / ISO 2836			
		Light BWS	Alcohol	Solvent mixture	Alkali
ALCHEMY Gold PANTONE 871	46 A 0871	8	+	+	-
ALCHEMY Gold PANTONE 872	46 A 0872	8	+	+	-
ALCHEMY Gold PANTONE 873	46 A 0873	8	+	+	-
ALCHEMY Gold PANTONE 874	46 A 0874	8	+	+	-
ALCHEMY Gold PANTONE 875	46 A 0875	8	+	+	-
ALCHEMY Gold PANTONE 876	46 A 0876	8	+	+	-

The hues that can be obtained using aluminium-based gold inks cannot be compared with those from brass-based inks, because the metallic character of the aluminium particles (whitish silver) is not the same as this of brass particles (with differing ratios between the components that make up the alloy). Aluminium-based inks, therefore, cannot offer the full degree of “brightness” that brass-based gold-inks can.

We recommend the following ink for sheet-fed offset:

ALCHEMY Alugold	46 A 5000	5	+	+	-
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## Two-component inks

In this case, the gold ink is mixed by the pressman himself from pigment paste and varnish immediately prior to the print run. When preparing the ink, care must be taken not to „overstress“ it, i.e. the components must be mixed as gently as possible. High-speed agitators and excessive heating of the ink during mixing have a negative effect on its quality and must therefore be avoided at all costs. If the conditions cited above are complied with, you will obtain very good metallic effects.

We recommend the following ink for sheet-fed offset:

		Paste	Varnish
ALCHEMY	Rich Gold	46 A 2050	10 A 0020
ALCHEMY	Rich Pale Gold	46 A 2150	10 A 0020
ALCHEMY	Pale Gold	46 A 2250	10 A 0020
ALCHEMY	Copper	46 A 2250	10 A 0040

As a rule of thumb, we recommend a mixture ratio of 50 parts paste by weight and 50 parts varnish by weight (1 : 1).

This ratio can, however, also be varied:

- More pigment paste gives a greater metallic effect with lower rub resistance.
- More varnish improves the transfer characteristics and rub resistance but reduces the metallic effect.

**Varnish 10A0020** is tinted in order to improve coverage with yellow or orange pigments. You may, however, use the non-tinted **Varnish 10A0030** for mixing, this bringing a slight improvement in the metallic effect.

It must be noted that there are coloristic differences between two-component and one-component gold inks.

## Metal-effect inks

You can produce metal-effect and imitation gold inks by mixing **Silver 46A3000** with chromatic inks in any mixture ratio you wish.

## Processing

The best metallic effect is obtained on coated stocks that have a uniform, smooth surface. Tests have revealed that uncoated and matt-coated substrates are not particularly well suited to printing with metallic inks due to their poor rub and smudge resistance. For this reason, you should determine - prior to beginning production - the extent to which the print will be subjected to mechanical stresses. In view of the fact that the systems are highly pigmented and possess excellent coverage properties, it is neither recommended nor necessary to try to enhance the effect by increasing the ink delivery. As a rule, this simply leads to printing problems such as piling on the press, poor stackability, long drying times and insufficient smudge resistance. One rule that has proven useful, especially in solid image areas, is never to print gold ink from the last printing unit. Smoothing the print with an additional rubber blanket helps to enhance coating quality.

Metallic pigments are susceptible to corrosion. Such corrosion leads to brass pigment changing their hue, turning a dirty brownish colour and becoming matt in the process. This fact must be taken into account when printing. For this reason, the pH of the fount solution should be no lower than 5.5, in order to obtain a perfect metallic effect. We recommend to use our fount concentrate COMBIFIX 8039 or the likewise as good as neutral fount concentrate COMBIDRY 8200 which has the added advantage of improving the drying characteristics of the ink. Delivery of the fount solution on the press must be kept to an absolute minimum - particularly when the level of ink application is low - in order to prevent excessive emulsification and the poor coating quality associated and drying problems associated with this.

Aluminium-based gold inks are easier to print than brass-based inks, because the proportion of relatively large pigment particles in the ink is considerably lower.

Surface finishing always results in a reduction of the metallic effect. The best solution is to coat the print with ACRYLAC water-based coating.

Gold inks should not be printed on films or film-like substrates without prior testing, because adhesion problems can arise depending on the substrate.

## Printing black on gold inks

If a preprinted gold image area is to be overprinted, inks that have been specially formulated with respect to their drying and ink trapping characteristics must be used due to the particular nature of the silver surface. Our **Special Black 49N5135** (coatable) has proven to be a good choice. This ink also offers the best conditions for wet-on-wet printing. Subsequent printing should only be performed once the print sheets in the bottom part of the stack are also thoroughly dry.

## Finishing instructions

When finishing metal-pigmented offset inks - by coating with ACRYLAC, laminating or UV varnishing, adhesion problems can arise between the ink film and the finish. These are caused by stabilisers and lubricants that have to be added during pigment production and which adhere to the metal pigment surface. We therefore recommend you test the coating/varnish-trapping and adhesion characteristics between the ink film and the finish thoroughly prior to beginning the print run. The converter must be informed of the fact that the print to be finished has been produced using metallic inks.

## Special instructions

If substrates with gold inks become affected by moisture or some other critical substances such as acids or lyes, there is a possibility of chemical reactions taking place that have a negative influence on the brilliance of the metallic ink. For this reason (and the influence of the fount solution is crucial here), ink left over in the ink fount (pan) after completion of the print run must not be kept for re-use. Likewise, substances in label adhesives can migrate from the rear through the label and react with the metallic pigment of the gold ink. You should therefore determine in advance whether or not the constituents of the label adhesive have a problematic influence on the gold ink.

All Gold inks listed in this technical information are stable for 12 months from the date of delivery.

## Classification

Material Safety Data Sheet available on request.