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November 11, 2013

Date of order: 23 October 2013

Description of task: Certification of two ink sets according to  
ISO 2846-1:2006

Submitted material: Two sets of inks for sheet-fed offset printing  
(Cyan, Magenta, Yellow & Black)

KOREA SPECIAL INK:  
New Bestack PSO Process Soya Cyan  
New Bestack PSO Process Soya Magenta  
New Bestack PSO Process Soya Yellow  
New Bestack PSO Process Soya Black

KOREA SPECIAL INK:  
Best Soy 2846 Cyan  
Best Soy 2846Magenta  
Best Soy 2846Yellow  
Best Soy 2846Black

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Investigator: Dipl.-Ing. [FH] Ludwig Zins

Sitz der Gesellschaft ist  
München, Deutschland

Attachments: Diagrams for graphical evaluation  
Supporting documents with testprints

Registergericht München  
Vereinsregisternr. 4909  
Steuernr. 143/215/00707  
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Geschäftsführer:  
Dr. Eduard Neufeld

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### Certification of the supplied ink set according to ISO 2846-1:2006

A series of test prints of known ink film thickness was printed on APCO-II/II paper strips as well as on black coloured APCO samples for each of the supplied inks. The test prints were prepared on a *prüfbau* printability tester in a range of ink film thickness specified for sheet-fed offset inks.

Colorimetric measurements on the test prints were performed according to ISO 13655 with mode M0 using with a spectrophotometer X-Rite SpectroEye (illuminant D50, 2° standard observer) on white backing. The instrument was calibrated with “NetProfiler”. For the determination of the ink colour the measurements were done in the white areas of APCO. The measurements for the transparency were performed on the completely black strips.

Documents 1-3 and 8-10 contain the graphs of colorimetric verification. The inks Cyan, Magenta and Yellow of both ink sets lie inside the tolerance range of  $\Delta E^*_{ab} = 4.0$  in the required ink film thickness interval between 0.7  $\mu\text{m}$  and 1.1  $\mu\text{m}$ . The two Blacks meet the requirements of  $L^* \leq 18.0$ ,  $a^* = 0.8 \pm 1.5$  and  $b^* = 0.0 \pm 3.0$  in the required ink film thickness interval between 0.7  $\mu\text{m}$  and 1.3  $\mu\text{m}$  (documents 4 and 11).

Table 1 and 2 show the minimum colour differences achieved between ISO 2846-1:2006 colour value specifications and test prints and their corresponding ink film thicknesses. The thicknesses are denoted with two decimal digits, whereas the judgement of conformity refers to rounded values with just one decimal digit.

Ink	Minimum colour difference $\Delta E^*_{ab}$	Ink film thickness in $\mu\text{m}$	In conformance with ISO 2846-1:2006
Cyan	0.5	0.75	Yes
Magenta	1.5	0.84	Yes
Yellow	1.7	0.97	Yes
Black	OK	$\geq 0.84$	Yes

Table 1: Minimum colour differences achieved between ISO 2846-1:2006 specifications and test prints and their corresponding ink film thicknesses for New Bestack PSO Process Soya.

Ink	Minimum colour difference $\Delta E^*_{ab}$	Ink film thickness in $\mu\text{m}$	In conformance with ISO 2846-1:2006
Cyan	0.4	0.77	Yes
Magenta	1.5	0.84	Yes
Yellow	1.5	1.00	Yes
Black	OK	$\geq 0.88$	Yes

Table 2: Minimum colour differences achieved between ISO 2846-1:2006 specifications and test prints and their corresponding ink film thicknesses for Best Soy 2846.

The transparency characteristics of New Bestack PSO Process Soya Cyan, Magenta and Yellow comply with the specifications of ISO 2846-1:2006 (documents 12-14 and table 3).

Ink	Specified transparency	Measured transparency	In conformance with ISO 2846-1:2006
Cyan	$> 0.20$	0.31	Yes
Magenta	$> 0.12$	0.36	Yes
Yellow	$> 0.08$	0.19	Yes

Table 3: Specified transparency according to ISO 2846-1:2006 and measured transparency of tested inks.

The transparency characteristics of Best Soy 2846 Cyan, Magenta and Yellow comply with the specifications of ISO 2846-1:2006 (documents 5-7 and table 4).

Ink	Specified transparency	Measured transparency	In conformance with ISO 2846-1:2006
Cyan	$> 0.20$	0.30	Yes
Magenta	$> 0.12$	0.38	Yes
Yellow	$> 0.08$	0.18	Yes

Table 4: Specified transparency according to ISO 2846-1:2006 and measured transparency of tested inks.



**The ink sets New Bestack PSO Process Soya Cyan, Magenta, Yellow, Black and Best Soy 2846 Cyan, Magenta, Yellow, Black are in conformance with ISO 2846-1:2006.**

**This expert opinion is valid for two years until November 2015.**

Inks that have passed the certification procedures shall be submitted for re-certification without a request having to be made in the event of changes to the ink recipe or the manufacturing conditions. Otherwise ink certificates run for a maximum of two years beginning from the date of the expert opinion.

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