



Original or imitation?

Eurostandard/Globalstandard System Brunner* *versus* ProzessStandard Bundesverband Druck und Medien e.V.

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Eurostandard / Globalstandard is System Brunner's standardization concept (1) that, since its introduction in 1975, has been continually expanded and upgraded to keep pace with technological developments in all process stages of proofing, printing plates and printing, and today represents the most comprehensive definition of a standard.

Eurostandard defines more than 30 influencing variables in the printing process alone. The use of Instrument Flight* technology enables the Eurostandard to be monitored at any time.

Anyone wanting to comply with the ProzessStandard under production conditions in offset printing cannot get around using the Instrument Flight* regulation strategy. Instrument Flight* automates the decision a printer has to make to comply with the standard, and optimally controls the color balances, tonal value increases, gradation, and solid tone inking in accordance with Eurostandard, a defined house standard, or the "visual OK".

The Bundesverband Druck und Medien e.V., Wiesbaden (bvdM) has taken over a great deal of the basic knowledge System Brunner has gained over time on its own expense, reformulated it and included it in this handbook without accreditation to System Brunner (Copyright) e.g.:

- The importance of tonal value increases before matching the solid ink densities
- The System Brunner Picture Contrast Theory
- The influence of color balance and light/dark differences (gradation deviations)
- Tolerance in solid density of 8% corresponds to ± 0.10 D with System Brunner
- X/Y presentation form for analysis and evaluation of analog/digital transfer processes
- Etc.

The following provides a comparison between some Eurostandard System Brunner* and ProzessStandard bvdM definitions.

(1) The Trademark Eurostandard is used in Europe, Globalstandard mainly in the USA and Asia



1. Tonal value increase (Dot gain):

Eurostandard System Brunner*:

Measurement in production at 50%, definition of the characteristic curve at 20 tonal value levels.

- **CMY 12% B 14%**, fluctuation tolerance gradation $\pm 4\%$ (2 Sigma, 95% of all values), gloss-coated paper type 1, screen frequency 60-70 l/cm or sheetfed offset with high-grade consumables.
- **CMY 15% B 17%**, fluctuation tolerance gradation $\pm 4\%$ (2 Sigma, 95% of all values), coated paper types 1-3, screen frequency 60-70 l/cm,
- **CMY 19% B 21%**, fluctuation tolerance gradation $\pm 4\%$ (2 Sigma, 95% of all values), uncoated paper type 4, screen frequency 54-60 l/cm,

Prozessstandard bvdM:

Definition at 40%, 50%, 70%, 75%, 80%

- 14%, paper types 1-2, fluctuation tolerance $\pm 4\%$ for 68% of all values (corresponds to 1 Sigma), 32% permitted to be outside tolerance
- 17%, paper type 3, fluctuation tolerance $\pm 4\%$ for 68% of all values (corresponds to 1 Sigma), 32% permitted to be outside tolerance
- 20%, paper types 4-5, fluctuation tolerance $\pm 4\%$ for 68% of all values (corresponds to 1 Sigma), 32% permitted to be outside tolerance

Comments:

The target values of the bvdM standard have been adapted to 1-2% to the Eurostandard System Brunner definitions, which are available since many years.*

Converted to 2 Sigma, the bvdM tolerances lie at $\pm 8\%$, this must be taken into account !! The Eurostandard System Brunner tolerances are more tightly defined and more in line with the printing process and picture requirements. Therefore, anyone complying with Eurostandard automatically complies with the bvdM standard.*



2. Color balance:

Eurostandard System Brunner*:

Defines 4 different color balances which are important for the overall picture and for process control

- Color balance in overprinted mid-tone, checked at the gray balance patch (C50%, MY41%)
- Color balance in overprinted solid tone, checked at the shadow balance patch (3x 100% CMY)
- Color balance in the individual color mid-tones, checked on the basis of tonal value increase at the individually printed 50% CMY screen patches
- Color balance in the individual color solid tones, checked on the basis of the individually printed solid ink densities 100% CMY

The production run tolerances are defined picture-related:

$\pm 2\%$ for low-contrast pictures with many gray or tertiary tones, conventional separation with chromatic build up (without Instrument Flight*- Color Control not to maintain). If low contrast pictures are have been separated with Gray Stabilization (GCR), then a $\pm 4\%$ tolerance may be acceptable for visual perception.

$\pm 4\%$ or up to $\pm 6\%$ for correspondingly higher-contrast pictures.

The Instrument Flight* regulation strategy weights the four balances in a picture-related fashion and calculates the optimal color regulation recommendation. To keep the color balance within the Eurostandard specification, the gradation (light/dark) and the total contrast (saturation in solid tones) are automatically and ideally corrected. Instrument Flight* controls the balances within a tolerance range of $< \pm 2\%$, providing the short-term repeatability of the printing system permits this.

ProzessStandard bvdM:

Provides general guidelines regarding the importance of color balance. Describes color balance shifts on the basis of tonal value increases in the individual colors. Differences between 2 colors should not amount to more than 5% so that the harmony of the balance is not too strongly affected. Mentions that balance fluctuations are more strongly perceived than light/dark changes (System Brunner Picture Contrast Theory 1985). States that colorimetric measurements cannot be used to provide regulation recommendations for a printing press.

Comments:

The information contained in the bvdM ProzessStandard regarding the most important criterion for keeping a picture constant are only rather general. Eurostandard System Brunner on the other hand provides precise information. With the patented Instrument Flight* technology the color balance is permanently monitored and*



controlled during production run. Anyone working with Instrument Flight can rest assured that also the general descriptions contained in the bvdM ProzessStandard are being conformed with.*

3. Process inks according to the “Norm”, Solid ink densities:

DIN ISO 2846-1 lays down testing instructions with nominal values and tolerances for the color locations. The test can only be conducted under laboratory conditions using special paper which is not used in practice. With Delta E*ab (formula 1976) the tolerances move from 3-5 which means that two standardized inks may show a difference up to Delta E*ab 10 without any complaints being justifiable. Their transparency is tested as well.

The ink supplier must guarantee that the deliveries are standard-compliant and the customer is entitled to request a certificate confirming this at any time. This corresponds to the basic idea of ISO 9001.

Eurostandard System Brunner*

For determining solid tone inking, System Brunner also uses the specification laid down by DIN ISO 2846-1, formerly the Euroscale (first definition 1968).

The additional stipulations for L*a*b* specifications and Delta E*ab tolerances for commonly-used papers are done without because most of these cannot be reliably tested in practice. Who is in a position to precisely check the prescribed ink film thickness of 0.7 – 1.2 micrometers on a printing press? On top of that, the influence that the color location of the ink and the solid ink densities have on the color of a 4-C picture is generally assessed wrongly and overestimated. It is the color balances and tonal value increases that mainly determine color conformity in illustration printing.

In Eurostandard, System Brunner has specified reference values for solid ink density and tolerances for various types of measuring devices, e.g.

- Status E with polarizing filters (Print Expert* 2000)
 - Status E without polarizing filters (QTI CCS with Instrument Flight*),
 - Filters for MAN Roland CCI measurement units with polarizing filters.
 - Status T without polarizing filters (QTI CCS with Instrument Flight*)
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- Reference values for Status E with polarizing filters, zeroed to paper white, coated papers:
C 1.30, M 1.40, Y 1.30 B 1.80 Tolerance ± 0.10 D
 - Reference values for Status E without polarizing filters, zeroed to paper white, coated papers:
C 1.10, M 1.20, Y 1.10 B 1.50 Tolerance ± 0.10 D
 - Reference values for Status T without polarizing filters, zeroed to paper white, coated papers :
C 1.10, M 1.20, Y 0.90 B 1.50 Tolerance ± 0.10 D



Reference values for other types of paper such as LWC or uncoated papers have been defined as well.

ProzessStandard BVDM:

Since in practice printing plants use papers that are very different to the “norm-paper” as far as optical appearance is concerned, the bvdM ProzessStandard specifies nominal values according to $L^*a^*b^*$ for 5 types of paper, and tolerance values between 5-8 Delta E^*ab for CMY. However these reference values are no longer valid for substrates that deviate from standardized types of paper.

Furthermore ProzessStandard gives suggested values for solid ink densities for the different types of paper. These values lie for example for paper type 1 zeroed to paper white at C 1.44, M 1.39, Y 1.35, B 1.75. The nominated tolerance is 8%, which corresponds to ca. ± 0.10 D.

Comments:

The approach taken by ProzessStandard bvdM is too theoretical and therefore in System Brunner's experience will be very often disregarded in practice. It also encourages printers to focus on solid tone inking. Either the printers notice that this doesn't work properly and they abandon standardization and measurements, or they have no idea what's really happening in the printing process and keep on manually correcting the visual differences in the picture by altering the solid ink densities.

*Printers must also feel they are being taken for a ride when they try to hold the tolerances specified in the “Norm” using Delta E^*ab (formula 1976) as a reference. This formula has been continually changed in the past few years in order to better achieve visual equidistance which users are expected to do.*

*6 units of Delta E^*ab (formula 1976) are considered according to the Delta E^*2000 formula in the CMY solids now only as a deviation of 2.5 units. And so what is presented in the standard as a large color difference is only rated as a slight color difference according to later findings. (See System Brunner's statement above that color location deviations from the standard are overestimated).*



4. Further Eurostandard System Brunner* definitions

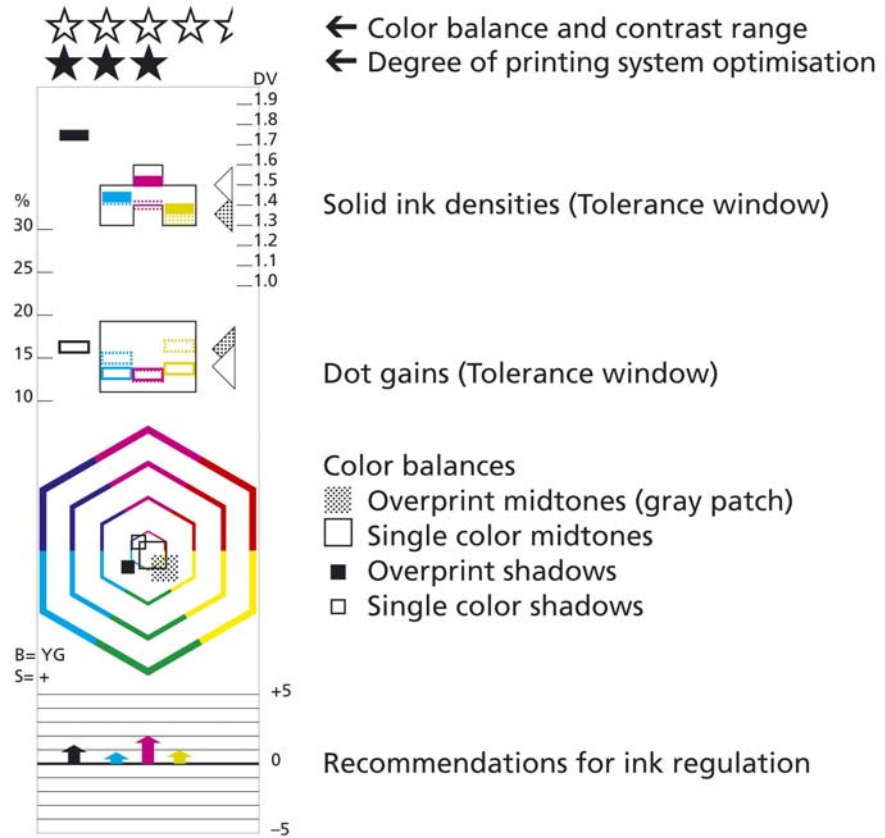
- **Three-color overprint of the process colors CMY.** This evaluates and standardizes the transparency of the inks and trapping. The effects that deviations in overprinting have on the picture are much more serious than the effects caused by minor colorimetric deviations in the individual colors. With Instrument Flight* technology, the printing plant can permanently monitor overprinting of the inks during production.
- **The System Brunner star rating system:** A maximum of five stars indicates how well the print result conforms to the defined Eurostandard.
- **System Brunner* conformity:** Describes to what extent the printing system is capable of simultaneously bringing solid ink densities and tonal value increases in conformity to the defined print standard.
- **CMY gray balance definitions** at 25 tonal value levels from the highlights to the shadows.
- **Print characteristic curves and plate characteristic curves** with 20 tonal value levels in the copyrighted System Brunner Isocontours* diagram.
- **General definitions and settings in separation / reproduction:** Maximum tonal value sums of all process colors for different types of papers and printing processes, screen rulings, UCR, gray stabilization (GCR), highlights/closure dots.

Further informations:

Eurostandard definitions in the article "Standardization instead of chaos" as download on the System Brunner website www.systembrunner.ch



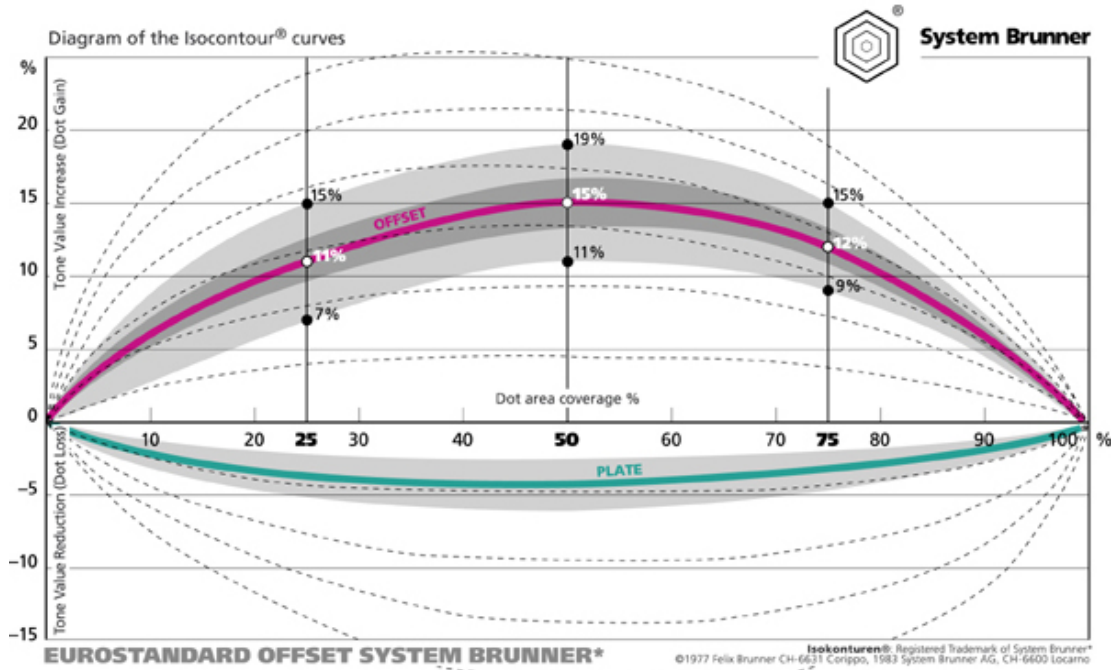
Eurostandard/Globalstandard System Brunner* Portrayal in the Hexagon* Diagram



System Brunner INSTRUMENT FLIGHT* Color Balance under Control

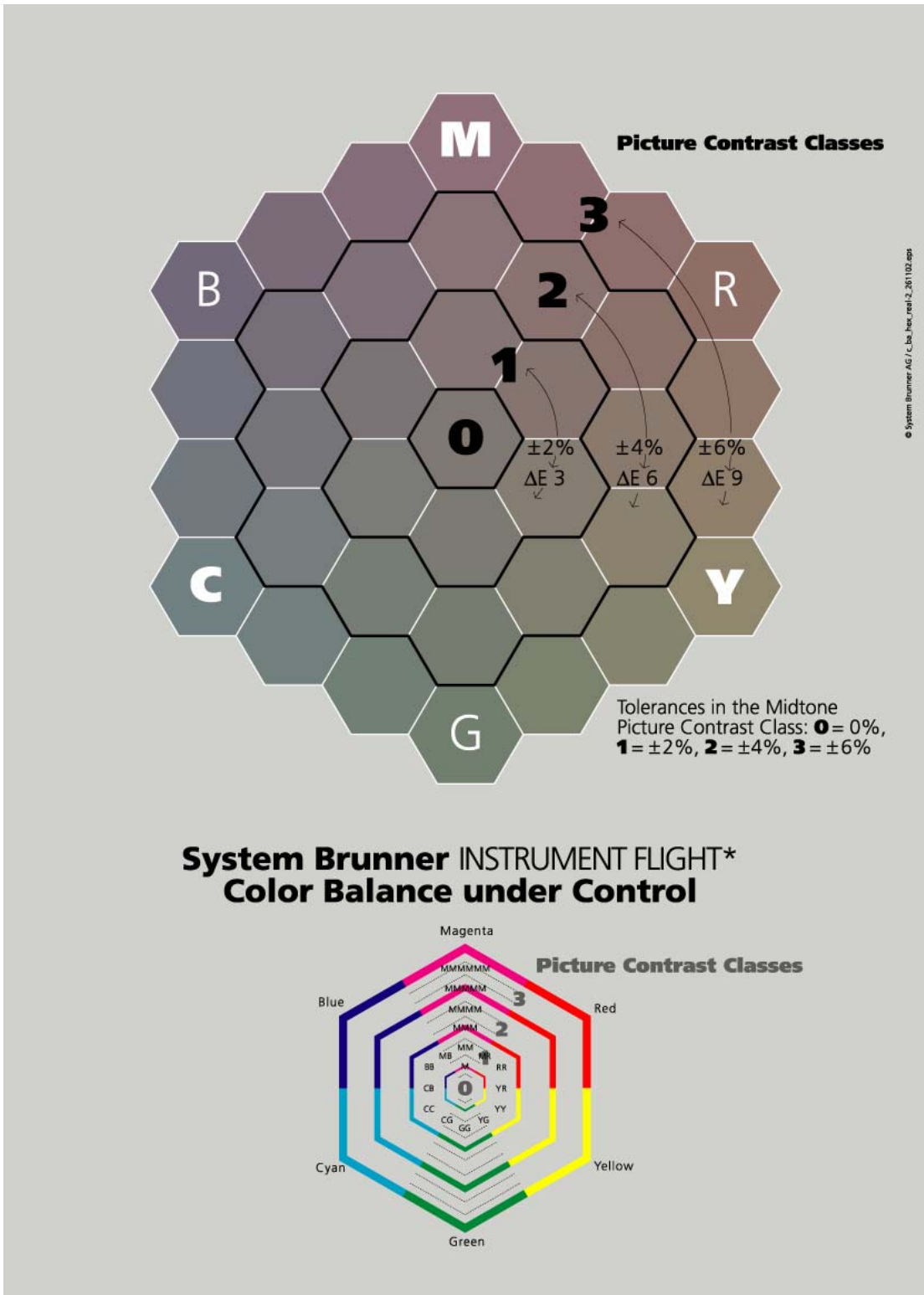


Eurostandard/Globalstandard* characteristic curves for printing plates (CtP) and offset printing, portrayed in the System Brunner Isocontours* diagram.



Under the brand name "Isocontours* diagram, System Brunner lays claim to the following intellectual properties (© 1977 Felix Brunner, 1983 System Brunner AG):

- X/Y presentation form for analysis and evaluation of analog and digital transfer processes for proofs, printing plates (CtP) and in the printing process (classical and digital printing).
- The proportions of the X/Y diagram.
- Isocontours*: characteristic curves with identical border zone changes over the entire tonal value progression.



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