

Characterization data for offset, newspaper and screen printing

The data provided in the accompanying characterisation tables provides colorimetric characterisation of various reference printing conditions that relate back to conditions specified in the parts 2 to 5 of the ISO 12647 series of international standards.

Characterisation tables show what colour to expect on a print if an image area with given CMYK data tone values is

- output one-to-one with a half-tone screen on to film with a (carefully linearised) image setter and if
- the job is printed on the print substrate stated, with standard tone values and standard solid inking as specified in the pertinent part of ISO 12647, with inks conforming to the pertinent part of ISO 2846 and if
- the colorimetric measurement is made according to ISO 13655 [12] or its pending revision which involves D50, 2 degree observer, 0/45 or 45/0 geometry, no polarizing filters, CIELAB and white or black backing.

The following table gives an overview of the files available:

FOGRA ¹⁾	PT	g/m2	Backing ²⁾	Process	Stand ard of	Screen cm ⁻¹	Profile	ISO designation
1	1	115	black	Offset, POS	1989	60	(obsolete)	(obsolete)
2	2	115	black	Offset, POS	1989	60	(obsolete)	(obsolete)
3	3	65	black	Offset, POS	1989	60	(obsolete)	(obsolete)
4	4	115	black	Offset, POS	1989	60	(obsolete)	(obsolete)
5	1	115	black	Offset, NEG	1989	60	(obsolete)	(obsolete)
6	2	115	black	Offset, NEG	1989	60	(obsolete)	(obsolete)
7	3	65	black	Offset, NEG	1989	60	(obsolete)	(obsolete)
8	4	115	black	Offset, NEG	1989	60	(obsolete)	(obsolete)
9		–	black	Screen, gamut class 2, conv. UV or water-based air-dried ink	2001	30		SC_GC2_CO_F30
11	1,2	115	black	Offset, POS	2004	60	ISOcoated bb	OFCOM_PO_P1_F60
12	3	65	black	Offset, POS	2004	60	ISOwebco atedbb	OFCOM_PO_P3_F60
13	4	120	black	Offset, POS	2004	60	ISOuncoat edbb	OFCOM_PO_P4_F60
14	5	120	black	Offset, POS	2004	60	ISOuncoat edyellowis hbb	OFCOM_PO_P5_F60
15	1,2	115	white	Offset, POS	2004	60	ISOcoated sb	OFCOM_PO_P1_F60
16	3	65	white	Offset, POS	2004	60	ISOwebco atedsb	OFCOM_PO_P3_F60
17	4	120	white	Offset, POS	2004	60	ISOuncoat edsb	OFCOM_PO_P4_F60
18	5	120	white	Offset, POS	2004	60	ISOuncoat edyellowis hsb	OFCOM_PO_P5_F60
19	1,2	115	black	Offset, POS	2004	70	ISOcoated 175bb	OFCOM_PO_P1_F70
20	3	65	black	Offset, POS	2004	70	ISOwebco ated175bb	OFCOM_PO_P3_F70
21	4	120	black	Offset, POS	2004	70	ISOuncoat	OFCOM_PO_P4_F70

							ed175bb	
22	5	120	black	Offset, POS	2004	70	ISOuncoat edyellowis h175bb	OFCOM_PO_P5_F70
23	1,2	115	white	Offset, POS	2004	70	ISOcoated 175sb	OFCOM_PO_P1_F70
24	3	65	white	Offset, POS	2004	70	ISOwebco ated175sb	OFCOM_PO_P3_F70
25	4	120	white	Offset, POS	2004	70	ISOuncoat ed175sb	OFCOM_PO_P4_F70
26	5	120	white	Offset, POS	2004	70	ISOuncoat edyellowis h175sb	OFCOM_PO_P5_F70
27	1,2	115	white	Offset, POS	2004	60	ISOcoated	OFCOM_PO_P1_F60
28	3	60	white	Offset, POS	2004	60	ISOwebco ated	OFCOM_PO_P3_F60
29	4	120	white	Offset, POS	2004	60	ISOuncoat ed	OFCOM_PO_P4_F60
30	5	115	white	Offset, POS	2004	60	ISOuncoat edyellowis h	OFCOM_PO_P5_F60
31	2	115	white	Endlos, POS	2004	60	ISOcofcoat ed	OFCOF_PO_P2_F60
32	4	80	white	Endlos, POS	2004	54	ISOcofunc oated	OFCOF_PO_P4_F54
33	2	115	white	Endlos, POS	2004	54	Fogra33	OFCOF_PO_P2_F54
34	4	120	white	Endlos, POS	2004	60	Fogra34	OFCOF_PO_P4_F60
35	2	115	white	Endlos, NEG	2004	54	Fogra35	OFCOF_NE_P2_F54
36	4	120	white	Endlos, NEG	2004	54	Fogra36	OFCOF_NE_P4_F54
37	2	115	white	Endlos, NEG	2004	60	Fogra37	OFCOF_NE_P2_F60
38	4	120	white	Endlos, NEG	2004	60	Fogra38	OFCOF_NE_P4_F60
¹⁾ S= ISO 12642-Table with 928 patches, L= ECI2002 table with 1485 patches ²⁾ White backing acc. to ISO/CD 13655 rev. C* < 3, L* > 93. Black backing: matte, density over 1,5								

All files contain "named data sets" according to ISO 12642:1996 (formerly known as IT8.7/3). i.e. characterisation data.

The printing conditions of the first 10 characterization files pertain to conditions specified in parts 2, 3 and 5 of ISO 12647. FOGRA 1 to 8 are now obsolete because the revision of the relevant standard ISO 12647-2 is near publication. The files FOGRAS5 to FOGRAS8 contain the same CIE colour data as FOGRAS1 to FOGRAS4, but data tone values that were reduced such that they would be fitting for negative plate making. IT IS THEREFORE IMPORTANT TO ASSURE FOR THE FILES FOGRAS5 to FOGRAS8 are used THAT THE PROFILING TOOL USED WILL ACTUALLY READ AND USE THE INPUT DATA TONE VALUES IN ADDITION TO THE CIE COLOUR VALUES.

FOGRA9 pertains to screen printing, gamut class 2, with conventional UV or water-based air-dried ink, screen frequency 30/cm.

FOGRA10 pertains to four-colour offset newsprinting with negative plates on to Newsshade-type paper with a screen frequency of 40/cm. Since the relevant standard is under revision, the characterization table will probably become obsolete in mid-2004.

The files FOGRA11 to FOGRA26 pertain to offset and offset continuous forms printing according to the revision ISO/DIS 12647-2:2004, with positive-acting plates or their computer-to-plate equivalent (in terms of tone values), 60/cm and 70/cm screen frequency, white and black backing.

The files FOGRA27 to 32 were generated during the production of the “Altona Test Suite Application Kit”. They pertain to offset commercial or four-colour continuous printing, screen frequency 60/cm (150 lpi) or 54/cm (135 lpi), with positive-acting plates or their computer-to-plate equivalent (in terms of tone values), white backing. FOGRA27 to FOGRA30 pertain thus to the same printing conditions as FOGRA15 to FOGRA18. The advantage of the former is seen in the fact that, during evaluation, the print characteristic curves were edited to be exactly in conformance with ISO/DIS 12647-2:2004, also the secondaries are seen to be closer to values in current European practice. The advantage of the latter is seen in the fact that they come closer to ISO/DIS 12647-2:2004 in terms of primaries and paper values.

The files of FOGRA33 to FOGRA 38 pertain to four-colour offset continuous forms printing with positive and negative-acting plates, 60/cm (150 lpi) or 54/cm (135 lpi) screen according to ISO/DIS 12647-2:2004. The characterization tables are based on FOGRA23 and FOGRA25 which were suitably edited. The profiles ISOCOFcoated, ISOCOFuncoated, and FOGRA33 to FOGRA38 are based on the characterization data tables FOGRA31 to FOGRA38. They were produced with the program Heidelberg PrintOpen with the following parameter settings: “More contrast in the dark colours”, black length 9, black width 5, Kmax= 100 %, tone value sum 350 % for paper type 2 and 320 % for paper type 4.

The numbering, ID#, and the listed locations, LOC, of the control patches of the characterisation tables is in accordance with ISO 12642.

The characterisation data may serve for the creation of colour management output profiles, for the calibration of off-press proofing devices and the verification of such calibrations by the user. Although there are some slight changes for different paper thicknesses, the data provided is representative for all substrates except perhaps some ultra light ones.

Acknowledgements

The work towards the establishment of the tables FOGRA1 to FOGRA 26 and FOGRA33 to FOGRA38 was sponsored by the German Printing and Media Industries Federation. The data for FOGRA27 to FOGRA32 was produced during the production of the “Altona Test Suite Application Kit”, see www.altonatestsuite.com. The project was a joint venture by the German Printing and Media Industries Federation, the European Color Initiative, FOGRA and UGRA with essential contributions by Dr. Guenter Bestmann of Heidelberg Druckmaschinen AG, Kiel subsidiary, Germany.

Literature and addresses

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ProzessStandard Offsetdruck (In German)
Wiesbaden: Bundesverband Druck und Medien e.V., 2001
- [2] ISO/DIS 12647-2:2004 Graphic technology - Process control for the
production of half-tone colour separations, proof and production prints, Part 2:
Offset processes
ISO, Geneva, CH
- [3] ISO 12642: Graphic technology - Prepress digital data exchange -
Input data for characterisation of 4-colour process printing
ISO, Geneva, CH
- [4] ISO 12647-1, Graphic technology - Process control for the manufacture of
half-tone colour separations, proof and production prints - Part 1: Parameters
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- [5] ISO 12647-2:1996 Graphic technology - Process control for the manufacture
of half-tone colour separations, proof and production prints, Part 2: Offset
processes
- [6] ISO 13655 Graphic technology - Spectral measurement and colorimetric
computation for graphic arts images
ISO, Geneva, CH
- [7] ISO 2846-1, Graphic technology - Colour and transparency of printing ink sets
- Part 1: Offset printing
ISO, Geneva, CH
- [8] ISO 2846-2, Graphic technology - Colour and transparency of printing ink sets
- Part 2: Newspaper printing
ISO, Geneva, CH
- [9] ISO 2846-3, Graphic technology - Colour and transparency of printing ink sets
- Part 3: Publication gravure printing
ISO, Geneva, CH
- [10] ISO 2846-4, Graphic technology - Colour and transparency of printing ink sets
- Part 4: Screen printing
ISO, Geneva, CH
- [11] ISO 2846-5, Graphic technology - Colour and transparency of printing ink sets
- Part 5: Flexo printing
ISO, Geneva, CH
- [12] ISO 12647-3 Graphic technology - Process control for the manufacture of half-
tone colour separations, proof and production prints - Part 3: Coldset offset

and letterpress on newsprint
ISO, Geneva, CH

- [13] ISO 12647-5 Graphic technology - Process control for the manufacture of half-tone colour separations, proof and production prints - Part 5: Screen printing
ISO, Geneva, CH
- [14] ISO/CD 12647-4 Graphic technology - Process control for the manufacture of half-tone colour separations, proof and production prints - Part 3: Publication gravure printing - work in progress
- [15] ISO/CD 12647-6 Graphic technology - Process control for the manufacture of half-tone colour separations, proof and production prints - Part 6: Flexo printing
- work in progress

Addresses

BVDM: Bundesverband Druck und Medien e.V., P.O.Box 18 69, 65008 Wiesbaden, Germany, Fax +49-611-803-194, ppf@bvdm-online.de

ECI, European Color Initiative, source of the ECI Guidelines for colour managed workflows, www.eci.org

FOGRA: FOGRA Forschungsgesellschaft Druck, P.O. Box 80 04 69, 81604 Munich, Germany, Tel. +49-89-4 31 820, Fax +49-89-4 31 68 96, www.fogra.org

ISO International Organization for Standardization, 3 rue de la Varembe, Case postale 131, CH-1211 Genève, Switzerland, www.iso.ch

ISO standards may be obtained from ISO directly or from national standards institutions.