

Optical ID

Printing Guides & Requirements

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Optical ID Printing Principles

1. Overview

1.1 OID Printing Principles

OID decoding system makes use of image capture topology to read the CODES from printed paper material followed by decoding them to digital data format. To cope with the OID decoding system requirements, it is required to embed the Color Layer(s) and Index Layer. Color layer(s) usually refers to the Graphic & Text Content while Index Layer refers to proprietary OID layer;

A. Color layers :

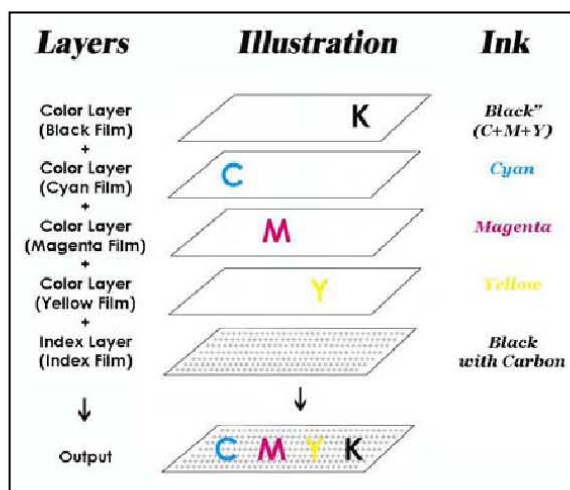
These layers can be edited and generated as conventional printing processes and primitive function is to generate visual content for instance graphics, text. Conventionally, processes consists either 3-color layer(s) or 4-color layer(s) printing.

B. Index layer :

Index layer consist all codes that can be decoded by OID system. From which, the customized functionalities can be performed by retrieving the codes. To generate the Index layer, please refer to the Sonix proprietary Authorization Tools User Guide for the detail operations.

1.2 5-films OID printing

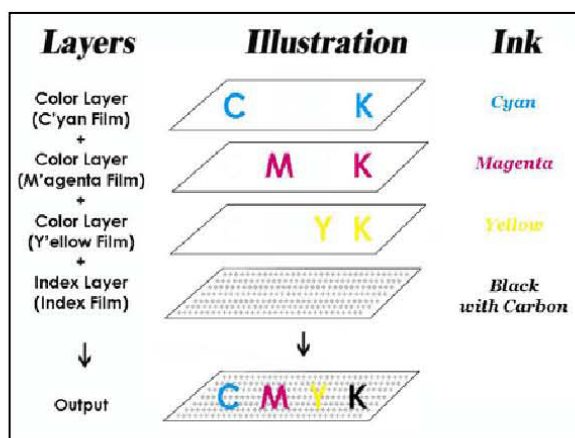
5-films printing methodology is required to make use of 4 color layer(s) and additional index layer. The ink for the index layer **MUST** contain carbon or graphite while the ink for the color layer(s) **MUST NOT** contain carbon or graphite. The ink of C,Y,M,K from conventional printing process, ONLY the ink for K film does contain carbon or graphite but not the ink for other films. Following summarized the ink requirements from each layer(s).



1. The INK for C-film → USE NORMAL ink for C-film (without Carbon)
2. The INK for Y-film → USE NORMAL ink for Y-film (without Carbon)
3. The INK for M-film → USE NORMAL ink for M-film (without Carbon)
4. The INK for K-film → Combine C + Y + M ink* to generate the **Near-BLACK** color and is recommended to make use of 1:1:1 proportion among C,Y,M.
(Any black Ink – without Carbon can be used for K-film printing)
5. The INK for index film → USE ink with CARBON
(or to use ink for normal K-film printing that usually contain Carbon)

1.3 4-film OID printing

4-films printing methodology is required to make use of **3** color layer(s) and additional index layer. The ink for the index layer **MUST** contain carbon or graphite while the ink for the color layer(s) **MUST NOT** contain carbon or graphite. The ink of C,Y,M,K from conventional printing process, **ONLY** the ink for K film does contain carbon or graphite but not the ink for other films.



Following summarized the ink requirements from each layer(s).

1. The INK for C-film → USE NORMAL ink for C-film (without Carbon)
2. The INK for Y-film → USE NORMAL ink for C-film (without Carbon)
3. The INK for M-film → USE NORMAL ink for M-film (without Carbon)
4. The INK for INDEX film → USE INK **WITH** Carbon or to use ink for normal K-film that usually contains Carbon.

1.4 Comparison on 4-films to 5-films OID printing

OID system does support BOTH 4- and 5- films OID printing processes. The essential concerns include the **COST, Compatibility and Visual Effect from printed material**

1. The coloring from 5-films printing is more accurate than 4-films OID printing processes which mean the Visual Effect would be better by making use of 5-films OID printing , provided that appropriated INK for Black Color should not contain carbon
2. Original C,Y,M,K films can directly be used on 5-films OID printing without any changes. It can simply include the INDEX film for OID printing that means more easier and quicker for content development
3. In 5-films OID printing, the Black color (or near-black) from the K-film being generated by the combination of C, Y and M films is likely to be dimmer than 4-films OID printing.
4. In 4-films OID printing, special attention to get the exact locations for each of the films need to pay. It will be more easier to use 5-films OID printing for the content comprises significant amount of TEXT
5. Printing cost from 4-films OID printing is likely to be CHEAPER than 5-films OID printing.

Example: Covert CMYK to CMY in Photoshop

1. Open image file in Photoshop
2. In Photoshop, choose Image/Mode/Convert to Profile
3. In "Convert to Profile" dialog box , choose Destination space/Profile/Custom CMYK
4. In "Custom CMYK/Separation Options" , select none" in Black Generation

2. OLD printing requirements1

2.1 Equipment Requirement

OID_II : The resolution of image setter is recommended to be NOT LESS than 1200dpi (dot per inch)

2.2 Paper Quality Requirement

Smoothness of paper that can support 600 dpi resolution printing is crucial on OID II system. Heaviness of the paper is not the primitive concern on OID II system

1. For better “reading and decoding” performance, it is recommended to use ART-COATED Paper
2. OID II can also apply to general office use A4 size paper.

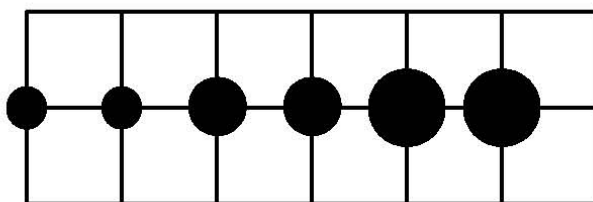
2.3 Size of OID II DOTs

To have best sensitivity from OID II system, the diameter of the DOT should be well controlled within the range of **40um to 80um**, as shown below. Detection angle is likely to be deteriorated if the diameter fell out of recommended range. For example, 0 to 45 degree can be achieved under conventional printing process while 10 to 35 degree can only be expected under poorer printing quality.

Remarks:

Printer or factory has to pay special attention to the INK intensity and the accuracy of the Index film

Diameter of OID II DOT



2.4 Tolerance of Center alignment of printed OID II Dots

Each complete OID Codes are constructed by a Matrix of Dots with identical size. The orientation of the dots is used to determine the “meaning” of the code. Therefore, locations of Dots MUST be consistent with the index film being generated by the Sonix Authorization Tools. The tolerance of the centre alignment should be well controlled within 10um. *The best sensitivity can be performed by having Dot's diameter well controlled within 40um to 65um.*

2.5 Contrast among the printed OID dots

Refer to Section 1, the ink being used to print Index layer should contain Carbon. The higher carbon level can give better contrast of dot pattern image during capturing. Hence, better sensitivity performance can be achieved. It is worth reminding the importance on controlling the use of INK upon the size & shape of the dots

2.6 Printing Environment

It is highly recommended to monitor the printing environment as cleanness as possible. Contamination of dust will easy distort the sensitivity or even degrade the Hit-Rate (OR increase the Error-Rate) of the OID II system

2.7 Verification on Index layer by using office use laser printer

Index layer of OID II system can be verified by office use laser printer which can support printing resolution up to 1200dpi. This function is very useful and essential during development stages. To print the index layer from the laser printer, the printer is required to set to finest resolution. Reading and decoding performance can further be enhanced by increasing the intensity of INK or by ensuring the printer rolling works properly.

2.8 Recommendation of Laser Printer :

MODEL : EPSON EPL2120, HP4000 series or others printer that can support printing resolution of TRUE 1200dpi.