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## ► The History of SWOP®

### SWOP Incorporated

Over the past thirty years SWOP has ensured consistency and quality of advertising material in publications. Because of the efforts of dedicated and passionate industry professionals driven to achieve attainable goals for an industry willing to improve itself, SWOP has become a major factor in the success of the publication printing industry in the United States.

### The Beginning of SWOP

In the late 1960s and early 1970s, as web offset printing of publications started to become popular and then predominate, it became obvious that the supplied input materials (proofs and film) were difficult for printers to match on press. Under these circumstances prepress service providers did their best, but without any specifications they merely were guessing at what the printer required. The situation was chaotic and getting worse. Printers were unable to run advertisements supplied from various sources in line with each other on the same press form and found it difficult to satisfy the advertiser's quality requirements.

In late 1974, a group of concerned industry experts met informally to explore the possibility of forming a committee to write specifications for material supplied to web offset publications. This is where the initial set of specifications that would become Specifications for Web Offset Publications — and its acronym, SWOP — were first envisioned.

Several key dates stand out in the publication printing industry during the evolution of SWOP. In 1986, the SWOP Specifications booklet included guidelines for web printing of publications. In the 1993 edition of the booklet, SWOP addressed specifications for electronic file preparation and transfer of graphic arts data in a digital workflow. In 1997 and 1998, SWOP addressed the emergence of computer-to-plate as an important production method for publication printers across the country. This was addressed in the booklet's eighth edition and in a subsequent brochure, "Digital Specifications and Requirements." Here the issues of standardizing file formats and digital proofing were first introduced. Throughout its history, SWOP has played a key role in helping the printing industry adapt to new technologies while continuing to ensure quality.

### SWOP Mission

The mission of SWOP is to continue to raise the level of publication printing quality by setting forth specifications and tolerances. SWOP accomplishes this by providing specifications for everyone involved in graphic arts workflow, which includes all forms of magazine advertising and editorial input, whether analog or digital. Adherence to these specifications ensures that all input received by the printer can be reproduced as intended and desired by the advertiser/publisher with minimal difficulty. Quality that is measurable and verifiable at each step in the prepress-to-print workflow allows everyone in the image reproduction process to monitor and improve performance by statistical methods.

### Current Direction and Philosophy

SWOP Specifications are core components of the SWOP success story. Updated on a regular basis to address critical trends in

## ► SWOP — A Vision for the Future

Nubar Nakashian, Chairman, SWOP Board of Directors

As we approach the 30th anniversary of the first publication of the SWOP specifications, I am encouraged by the improvement in print quality the publishing industry has achieved over those years. We have seen the transition from a film-based process to essentially an entirely digital workflow. This evolution was made possible by the use of standard practices. As we continue to explore opportunities to become more efficient, cost effective and competitive with electronic media, we must build upon the experience and successes of the past.

In the near future, I expect the industry to move more quickly toward a "proofless, print-by-the-numbers" workflow. In many applications we already are using our computer monitors for proofing. A key benefit of such technologies is reducing the time cycle necessary to produce a project. SWOP-certified systems are now available for digital, hard proofs and for evaluating color images on a computer monitor. Color management provides us with tools to control color throughout the process. Computer-to-plate devices have virtually eliminated image register problems. Closed-loop, color control systems on web presses assure faster makeready and improved color consistency throughout the press run. The industry is at the brink of completing the JDF standard that will allow seamless communication of page, image and business information between equipment and systems.

The recent affiliation of SWOP and IDEAlliance and coordination of the best practices of SWOP, GRACoL and SNAP, are efforts that will provide great value to the industry, and also will provide one common location for industry standards and communication. In addition, we are launching several innovative new programs to increase awareness of SWOP and acceptance of its specifications. First, of course, is the completion of the SWOP 10th Edition Specifications and the redesign of our website, [www.SWOP.org](http://www.SWOP.org), to make it more useful and easier to navigate. Also planned are web-based tutorials to show agencies how to prepare SWOP-compliant ads in a few "how-to" steps, and a search tool designed to help agencies find recommended prepress providers capable of producing SWOP proofs. Also on the horizon are a SWOP Digital Calibration Kit "webinar" and SWOP Speakers Bureau.

Finally, I hope we can inspire everyone in our industry to take an active part in helping SWOP achieve its mission to "continually raise the level of quality of publication printing by setting forth specifications, tolerances and functional, experience-based compliance procedures." Only by the contribution of time and information from companies and individuals is SWOP able to respond to the needs of our industry and implement change. If anyone wishes to take an active part in this process, please contact SWOP and volunteer to participate in the regular SWOP Review Committee meetings. It is only through the flow of new ideas, technical innovation, and thorough discussion that we are able to improve our industry and fulfill our mission.

SWOP is a registered trademark of SWOP, Inc.

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The SWOP Specifications are core components in the SWOP success story. They have been updated and printed in 10 editions starting with the first edition, pictured above with some of its contemporaries.



## ► The SWOP Certification Program for Off-Press Proofing Systems



The SWOP Certification seal, carried on promotional materials and packaging, assures clients of quality and consistency.

### What is the SWOP Certification Program?

One of the key contributions SWOP has made to ensure quality and consistency in the publication printing industry has been the SWOP Certification Program and its accompanying Certification Mark for proofing systems. The impetus for creating the program resulted from an increasing diversity in the development and marketing of digital proofing devices and the broad range of tonal reproduction of the proofs they produced. Fortunately, proofing manufacturers and SWOP were able to work together in developing a common, measured goal in the certification program.

Under this certification program, manufacturers of proofing systems submit a SWOP Application Data Sheet (ADS) and two proofs made to that ADS. SWOP representatives check the proofs submitted for certification against the supplied ADS for quantitative conformance then determine the acceptance of each system's visual match to a SWOP-certified press proof using TR001 as a target. Proofing systems that successfully demonstrate such a match are granted SWOP Certification and may carry the SWOP Certified seal on packaging and advertising materials for a fixed period of time.

### What is TR001?

TR001 refers to an ANSI technical report titled, "CGATS TR001-1995 Graphic Technology-Color Characterization Data for Type 1 Printing." ANSI is the acronym for American National Standards Institute and CGATS is the acronym for Committee for Graphic Arts Technology. Industry-referenced targets such as TR001 are necessary to the integration of digital workflows. The value of a TR001 target is that its data allows users to create ICC profiles for use in color management applications.

### How is TR001 related to SWOP Certification?

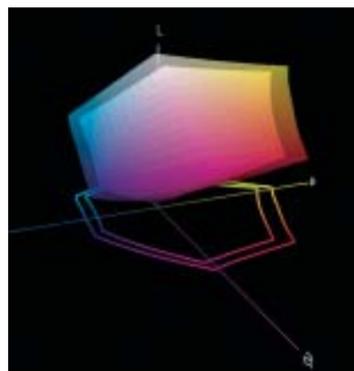
All SWOP-certified press proofs are verified to have been printed to SWOP reference print conditions as specified by SWOP and documented in CGATS.6. The characterization data measured in the IT8/7.3 target on a SWOP-certified press proof should be very close to that documented in TR001. Therefore, a proofing system that accurately simulates the TR001 characterization should simulate a reasonable match to the SWOP Certified Press proof.

### How do I find out if a proofing system is SWOP Certified?

SWOP provides an up-to-date list of SWOP-certified proofing systems on its website ([www.SWOP.org](http://www.SWOP.org)) along with the Application Data Sheets for those certified systems. If your proofing system is not listed as being certified, ask your vendor to apply for certification. Certification application information also is located on the SWOP website. Certification implies that the device is capable of creating a SWOP compliant proof. It does not mean, however, that any individual proof made on that system is SWOP-certified, nor does it mean that certified proofs from different systems will match exactly.

All SWOP-certified systems must provide an Application Data Sheet (ADS) that gives instructions on how to make a SWOP proof with that device. The ADS presents the manufacturer's recommendations including sequence, colorants and substrate. When followed, the recommendations result in appropriate colorimetric (CIELAB) and densitometric data that provide the best match to SWOP-certified proofs. Additionally, SWOP has established a method to verify a proof's conformance to the manufacturer's ADS. Users may contact SWOP for the necessary procedures. You can find the ADS of any certified system on the SWOP web site.

Three-dimensional CIELAB graphic comparing the larger color gamut of GRACOL-TR004 to that of SWOP-TR001.



the print publication industry, these specifications are the result of input received from a wide range of endorsing organizations whose key concern is quality in publication printing. These specifications continue to represent industry-wide consensus on quality standards. Individuals from these groups, manufacturers of proofing devices, paper and ink and concerned end users all participate in the SWOP Review Committee. This committee meets regularly to decide what is needed to keep the specifications up to date. Ideas emanating from the SWOP Review Committee have resulted in the SWOP Certification program, SWOP Digital Calibration Kits, SWOP Certified Press Sheets and other educational initiatives. SWOP can continue to address the needs of the Print Publication industry, but only with your participation. So, get involved today by contacting us at:

### SWOP

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## Milestones of SWOP

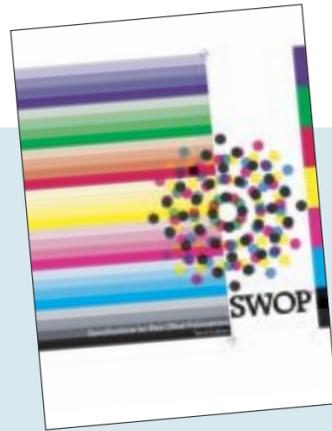
SWOP Milestones—ensuring consistency and quality of advertising material in publications for over 25 years.

|      |  |
|------|--|
| 1974 | A group of concerned industry experts meet to explore the possibility of forming a committee to write specifications for material supplied to web offset publication printers.   |
| 1975 | Representatives of various graphic arts industry segments agree to form a review committee and write specifications. It is decided that unanimous agreement of all endorsing organizations was required for approval of the specifications and all future updates. This becomes the core concept on which the SWOP Specifications are founded.<br>William Sullivan, then of McGraw Hill, is elected Chairman, a post he held until 1991. |
| 1976 | Specifications for Web Offset Publications and its acronym, SWOP, are first used. Specification booklet updates are published in 1977, 1978, 1981, 1986, 1988, 1993, 1997 and 2001   |
| 1986 | The 1986 booklet edition updates the specifications, and for the first time includes guidelines for the web printing of publications.<br>In cooperation with GAA (Gravure Association of America), SWOP specifications are adopted by the gravure process, which allows advertisers to produce film that can be used interchangeably.  |
| 1988 | SWOP is incorporated as a not-for-profit corporation, and a board of directors is formed.  |
| 1993 | SWOP specifications begin to address electronic file preparation and the transfer of graphic arts data in a digital workflow.<br>Off-press, analog and digital proofing are covered in more detail, including the development of SWOP Application Data Sheets that help users make a proper proof.   |
| 1997 | In the eighth edition of the booklet and in a subsequent brochure, "Digital Specifications and Requirements," SWOP addresses computer-to-plate as an important production method for publication printers across the country.  |
| 1999 | SWOP debuts the SWOP Certification Program for Off Press Proofing Systems.   |
| 2000 | SWOP, Incorporated becomes affiliated with the Digital Distribution of Advertising for Publications (DDAP) for the purpose of creating synergy with other industry standards groups.   |
| 2003 | "SWOP" becomes registered as a trademark of SWOP, Inc  |
| 2004 | SWOP and IDEAlliance form a coalition to support print media through the coordinated development of standardized specifications and guidelines, certification programs, software tools, educational seminars, and peer support networks.   |



## ► What is The SWOP Specification?

SWOP specifications cover virtually the entire print advertising workflow from proper viewing of art and proofs to final file formats. Conformance to these specifications allows advertising agencies to produce and send input materials to publication printers and know that these materials can be reproduced accurately. Observance of these specifications allows the publication printer to gather those input materials, place them in large press forms and reproduce them with the least amount of waste while meeting the advertisers expectations.



10th Edition SWOP Booklet

### SWOP Specifications

These specifications are for the preparation of input materials sent to a publication printer. This includes digital files and proofs of all kinds.

#### Viewing of Artwork and Proofs

Artwork, proofs and final printed product **MUST** be viewed and/or compared using 5000 Kelvin (D50) illumination complying with ISO 3664:2000, "Viewing conditions for graphic technology and photography."

#### Digital Page Preparation

SWOP assumes that all pages are created by digital means, whether they are to be delivered as film or digital file. Most publication printers are now requesting pages to be delivered in digital form.

**Type Reproduction:** Thin lines, fine serifs and lightweight or very small type should be restricted to one color. Reproduce all colored type with a minimum of colors.

Reverse type and line art should not be less than .007" (1/2 point rule) at the thinnest part of a character or rule. Reverse type should use dominant color (usually 70% or more) for the shape of letters. Where not detrimental to the appearance of the job, make the type in subordinate colors slightly larger to minimize register problems on the production press. Small type and fine serifs should not be used for reverse type. The surrounding tone must be dark enough to ensure legibility.

Overprinted (surprinted) type should not be less than .004" (1/3 point rule) at the thinnest part of a character or rule. When type is to be overprinted, the background should be no heavier than 30% in any one color and no more than 90% total in all four colors for legibility.

**Image Trapping:** All supplied materials sent to the publisher or printer must be trapped properly and, when possible, image trapping should be represented in the accompanying SWOP proofs.

Since files must be trapped when exchanging PDF/X-1a files, the trap flag must be set to "TRUE".

**Vignette or Fade-away Edges /Minimum Printable Dot:** Special care should be taken with fade-away edges where the fade-away is made up of more than one color. Generally, fade-away shadows are best reproduced in black only.

With computer-to-plate technology it is possible to accurately produce 1% dots on plate. In preparing digital files this should be kept in mind. For critical work it is important to use a proofing system that reflects this minimum tone reproduction characteristic.

**Screen Rulings:** When film or analog halftone proofs are supplied, the nominal screen ruling should be 133 lines per inch. When a prepress provider supplies digital files, screen rulings are no longer an issue unless the press or off-press proofs are made with a halftone dot pattern. Screen rulings and screen angles typically are now the responsibility of the printer when digital files are accepted as input.

The specification for digital, halftone proofs supplied by a prepress supplier is 133 lines per inch (52 lines per centimeter), which is the recommended nominal screen ruling.

**Screen Angles:** Digital files sent to a publication printer should not include screening parameters and dot shape.

Screen angles and rulings should be such that no moiré pattern should appear in the film, proof or print.

Gravure printers normally require digital files and not film. If films are provided to a gravure printer, however, colors other than yellow should avoid angles between 75° and 105°.

**Total Area Coverage (TAC):** The total of dot percentages in any spot in the four-color file or films should be no more than 300% to minimize ink drying problems.

For some small, non-critical image areas that carry no detail, TAC may exceed 300%. TAC in these small image areas must be less than 325%.

Super Calendared (SC) Papers generally require TAC in the range of 260% to 280%.

#### Final Material

**Digital Files:** Files representing print-ready material should be exchanged only as CMYK data using the TIFF/IT-P1 or PDF/X-1a file formats or their future versions. The use of non-standard, application or native file formats is not permitted.

A SWOP proof, made from the supplied file, must be furnished to the publication printer with all supplied digital files.

The files should include all image trapping and should incorporate all of the other logical parameters specified by SWOP for film preparation (e.g., UCR/GCR, gray balance, register marks, total area coverage, etc.). However, files should not include screening parameters or dot shape.

Specifications help everyone in the print production workflow by keeping costs down and helping to keep printed materials viable in a world of increasing media options competing for advertising dollars.

Because of space limitations, this is not all of the SWOP specifications. In some instances the ones included have been condensed. This is only a sampling to give you an idea of specifications content and importance in the print advertising workflow. Complete specifications will appear in the new 10th edition of SWOP specification booklet, which will be released soon. Check the SWOP website, [www.SWOP.org](http://www.SWOP.org), for availability. Everyone in our industry should have a copy of the new booklet and insist that designers, prepress providers, suppliers, printers and publishers all have the new SWOP 10th edition booklet.

File resolutions should conform to, or be compatible with, the publication printer's output device resolution requirements. The individual publisher should be consulted for this information.

Data compression used within files should comply with the provisions of the TIFF/IT-P1 and PDF/X-1a file format standards.

#### Proofing

The color guide should be an offset press proof made to SWOP specifications or an off-press proof made by using only a SWOP Certified Proofing System and made according to the manufacturer's SWOP Application Data Sheet.

**Color Bars:** To be considered a SWOP proof, all proofs must include a SWOP specified Color Control Bar and be clearly identified with available job information and proofing system identification. The bar should contain the following control elements, whether the proof is made on press or off-press, analog or digital:

Screened areas with rulings of 133 lines per inch with values of 25%, 50% and 75% of each of the primary colors in physical proximity to a solid patch. Two-color overprints of the same 25%, 50% and 75% are also recommended. Additional areas such as 1%, 2%, 3%, 5% and 95%, 97%, 98%, 99% may be useful, especially for digital output. In the case of off-press proofs that contain no screen pattern, tones should match the above values.

A gray balance control bar or patch, in the case of off-press proofing, must be included on the proof and designed to match the neutral appearance and weight of black tints of three different values under standard viewing conditions. The black and three-color gray balance portions of the color bar should have the following values:

#### Gray Balance

| Black | Cyan | Magenta | Yellow |
|-------|------|---------|--------|
| 75%   | 75%  | 63%     | 63%    |
| 50%   | 50%  | 40%     | 40%    |
| 25%   | 25%  | 17%     | 17%    |

#### Press Proofs

**Paper-Proofing Stock:** Standard proofing paper is 60# basis weight paper of 72 (nominal) TAPPI brightness. Brightness varies with age.

The paper may be a coated, groundwood stock or a sheet coated to simulate the appearance of such a groundwood stock. A paper known to meet these specifications is Monterey Gloss, (a SWOP Specified Proofing Paper), manufactured by the Tembec Paper Group and distributed by Manchester Industries and sold in sheet form by various paper merchants.

**Standard Ink Colors:** Proofing inks must be used that conform to ISO 2846-1: "Graphic technology — Specification for color and transparency of printing ink sets — Part 1: Sheet-fed and heat-set web offset lithographic printing."

**Tone Value Increase (Total Dot Gain):** In order to ensure properly balanced tone reproduction, Tone Value Increase (Total Dot Gain) at 50% from file or film to print should be:

|         | Target Value | Tolerance (±3%) |
|---------|--------------|-----------------|
| Yellow  | 18%          | 15 – 21%        |
| Magenta | 20%          | 17 – 23%        |
| Cyan    | 20%          | 17 – 23%        |
| Black   | 22%          | 19 – 25%        |

To help obtain proper gray balance, this specification includes the restriction that gain values of the three colors (Y, M, C) should not differ from each other by more than 4% from their target values.

**Print Contrast:** Print Contrast is an important characteristic in printing and proofing and should be controlled in order to better define the entire tone curve.

Control of Print Contrast at the 75% tone value is a specification for proofing and must be maintained.

Print Contrast specifications at the 75% tone value are based on data obtained from the several Certified Press runs are as follows:

| Color          | Center Point and Range |
|----------------|------------------------|
| Yellow         | 25 ±5%                 |
| Magenta & Cyan | 35 ±5%                 |
| Black          | 38 ±5%                 |



