US Involvement in Graphic Arts Standards Activity
A Partial History

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Abstract: For most of its history, the United States graphic arts industry has had a cautious relationship with formal standards activities. The earliest accredited activities were in the area of printing equipment safety. Outside of the safety area, formal standards activities were usually ignored by the graphic arts industry and even trade association specifications were looked at with suspicion. The formation of iso/tc130 in the 70s was ignored by the us industry.

The arrival of color electronic prepress systems (CEPS) in 1980 became the motivation for a number of people to begin a drive to develop formal standards activities in the US. This resulted in the creation of IT8 and COATS. The need to gain international recognition of the early graphic arts data exchange standards, created by IT8, became the motivation for the reactivation of ISO/TCL30 - Graphic technology.

Unfortunately, most of the records of these activities are in the form of oral history. This paper will summarize some of that history in written form.

Introduction

Much has happened and many people have contributed to the United States involvement in the development of industry specifications and accredited standards for the graphic arts. Unfortunately, most of the records of these activities are in the form of oral history or buried in long lost minutes of meetings. This report will try to summarize some of that history in written form. Because much of this report is based on my perspective, memory, and records, it is not guaranteed to be either complete or balanced. However, I hope that it will provide a draft for others to build upon, so that a more complete history of these activities is available for those that follow.

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Standards activities come in many varieties with varying degrees of formality. One big division is among the formal or accredited standards and the many industry groups and consortia involved in developing trade specifications and practices.

What are accredited standards? Standards committees (and the standards that they prepare) that operate under the guidelines of the American National Standards Institute (ANSI), the International Organization for Standardization (ISO), or the International Electrotechnical Commission (IEC) are considered accredited or formal standards activities. These groups have well-established guidelines for the development of standards — all require openness in their processes, broad industry representation, and public review of standards during the approval process.

While not part of the accredited standards process, some of the industry groups developing specifications follow the same consensus principals that we associate with the accredited process. Others, particularly consortia, are open only to the members of the sponsoring organization. The degree of openness of the development process is often a measure of the industry wide acceptance of the specification(s) produced.

Last, but by no means least, are the proprietary or defacto standards. These are usually prepared and owned by a single company. These industry activities, according to a purist, are not "standards". However, when they receive broad acceptance and/or facilitate communication within the industry, we must include them as part of our standards portfolio. In fact, when there is a strong formal standards process in place, both defacto standards and trade specifications are often the precursors to formal "standards".

Unfortunately, for many years the printing and publishing industry (particularly in the United States) has had a general distrust and misunderstanding of both industry specifications and formal standards. Printing was viewed as a quality craft and standards were felt to represent the lowest common denominator of quality — and no one printed "that way". The more pressing issues needed for basic technical communication — densitometry, viewing conditions, etc. — were adopted from the photographic standards of ISO 42 (Photography) and its equivalent US and other national body groups.

The only clear exception to this, was the work that has been ongoing since the 1950s, under ANSI Committee B65, in the area of safety of graphic arts equipment. Although the work of this group is vital to our industry, and we applaud their participation in the accredited standards process, I have not

had much involvement with B65, hence this summary will therefore focus primarily on the area of prepress and printing.

The Beginnings

The late 60s and early 70s were an unusual time for graphic arts standards activities. During this time ISO TC130 (Graphic technology), SWOP (Specifications for Web Offset Publications), and the GTA (Gravure Technical Association) standards group on viewing conditions were all formed. There were other industry groups before this that focused on specific issues, but there seem to be few records of their activities.

ISO/TC130, Graphic technology

The initial proposal for an ISO standards committee in the area of Graphic Technology came from Sweden, and is dated 7 June 1968. The justification for the formation of an ISO Technical Committee in this area included the following statement (ISO, 1968):

> "The graphic arts industry, or more appropriate—the visual communications industry — has a great impact on the economy in the countries participating in the ISO The importance of standards for products, methods of testing and terminology in the graphic arts industry is especially evident in countries which are developing domestic production of books and other products for visual communication."

The issues are still the same.

Ironically, that proposal listed over 200 graphic arts national body standards from 10 countries that had been prepared in the preceding 3 years, but none from the United States. The forming meeting of the newly created TC130, Graphic Technology, was held 2-4 June 1971 in Paris, France, with AFNOR (Association Fran,çaise de Normalisation) as the secretariat. Participating countries were Australia, Brazil, Czechoslovakia, Finland, France, Hungary, Italy, Poland, Romania, Spain, Sweden, Switzerland, United Kingdom, and the USSR. Noticeably absent was the United States.

The initial focus was on terminology, paper sizes, correction marks, and typographical measurements. This was soon followed by a considerable flurry of activity around the issue of the interaction of ink with a number of chemicals and food products, including wine. Unfortunately, records from that era are sketchy but we do know that a second Plenary was held in 1975 in Paris, France and a third Plenary in Lausanne, Switzerland in 1980.

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In a TAGA article McCamy (1977) described the newly formed TC130 and urged the United States printing publishing industry to become involved. He suggested that taga might be a logical group to coordinate United States participation.

SWOP

In late 1974, a group of concerned United States industry people met informally to explore the possibility of forming a committee to write specifications for material supplied to publications printed using web offset. In early 1975, representatives of various segments of the printing industry were invited to a meeting. At that meeting it was decided to form a Review Committee and invite all interested parties to participate. William Sullivan, of McGraw Hill, was elected chairman and an initial set of specifications were published by the end of 1975. These specifications drew heavily on work that had been done earlier by an informal group concerned with the input to publication printing using letterpress web. In 1976, the present name and the acronym, SWOP, were first used.

Not surprisingly, many of the early participants in SWOP have also had a strong impact on other standards activities. Typical are Joel Rubin (Phototype Color Graphics) who has represented IPA on many of these activities, Frank Benham (Eastman Kodak Company and later American Color), George Leyda (3M), and Tom Basore (DuPont and later PIA/WOA).

Other Industry Activities

In the mid 70s the Gravure Technical Association (GTA) formed a committee to promote standard viewing conditions within the advertising segment of the printing industry. Frank Benham, a key figure in that committee, also headed up the GTA Input Copy Requirements Committee. Both of these groups strongly supported the ANSI viewing standards which had been developed by ANSI PH2 (Photographic Sensitometry). However, Frank reports that they had two problems; there was no recognized graphic arts industry spokesman on viewing standards and there were no graphic arts industry representatives on the ANSI PH2 Committee. The members of ANSI PH2 (and its subcommittees), which developed the viewing standards, were all from the photographic industry and the secretariat was the National Association of Photographic Manufacturers. To remedy this situation the GTA committee pushed for and received observer status for GTA, with Oscar Smiel of Intaglio in New York as the first representative. According to Frank, this was really the first graphic arts effort to get involved in the formal standards process.

Soon after the GCA Spectrum Conferences began in the late 70s an unofficial group got together and called themselves the "Quality Control Association." It was a small group made up mostly of QC people from the printers. As the meetings progressed it became obvious that you couldn't have QC without a base to measure from, and it also became obvious that standards with official stature needed to be pursued. In 1983, a group was formed under "The Master Printers of America" section of the Printing Industries of America (PIA). After 2 years of effort, it went into limbo for lack of interest.

The Middle Years

The Digital Issues

In 1979, at the IMPRINTA graphic arts show in Milan, and in 1980 at Graph Expo in Chicago the first Color Electronic Prepress System (CEPS) was publicly introduced. Although not recognized at the time, this event started a revolution in graphic arts technology and made standards mandatory.

In 1982 I was asked to present a report on "Data Storage in Publication Gravure" (McDowell 1982a) to the Annual Conference of the Gravure Technical Association (GTA). A similar paper was presented at TAGA that same year (McDowell, 1982b). In those papers I suggested that:

> "Computer systems and software designed by different manufacturers often cannot talk to each other. The simplest solution to this problem would be for all trade houses, publishers, cylinder preparers and printers to use a system made by the same manufacturer. That's not very feasible. Short of this, a common standard for both data format and electronic exchange media would have to be established to enable information to be transferred between different kinds of systems."

I certainly did not realize the immensity of the task I was proposing.

Others, like Dr. S. Thomas (Tom) Dunn, and Frank Benham (American Color), were also becoming concerned about the need for standards, particularly in the area of electronic data interchange between CEPS. In late 1984 at the winter meeting of the TAGA board of directors, Tom and I tried to convince the board that TAGA should take the lead in coordinating the development of accredited standards for the graphic arts with a primary emphasis on electronic data exchange. The board did not agree with our proposal (and in retrospect, that was the correct decision for TAGA), so Tom and I decided that we would take on the task of rousing interest in the

industry. We flipped a coin to see who would give a presentation at the upcoming taga conference, describing our concerns and sending out a call for action. Tom got the responsibility, and Patrice (then Wagner) Dunn made the presentation (Wagner, 1985) at the 1985 taga Annual Conference.

Tom was not satisfied that anyone really heard our concerns and he devoted considerable time and energy trying to find an industry association that would take on the responsibility for establishing an accredited standards committee for graphic arts. No one was willing to accept the challenge.

In a bold stroke, typical of his style, Tom arranged a panel discussion (confrontation) between CEPS users and vendors at his 1985 Lasers in Graphics Conference held September 29 - October 3 in Nashville, Tennessee. As an outcome of that forum, the user community chartered Tom and Dunn Technology Inc. (DTI) with the responsibility of pulling the vendors together to discuss the development of digital data exchange standards (DDES). The first meeting of this group was held in December 1985 with representatives of Crosfield Electronics Ltd., 3M Comtal. Eikonix (A Kodak Company), Scitex, Dai Nippon Screen Mfg. Co. Ltd., and Hell GmbH present — all of the major CEPS manufacturers. Tom was elected chairman of the group.

This initial attempt at developing data exchange standards was focused at what was then the only exchange media available to all of the vendors — 9 track magnetic tape (remember this was 1985). Everyone recognized that this was a first step and media independent formats would be required, we just didn't realize how quickly the technology would change.

TC130 Events

Although the last meeting of TC130 had been held in 1980, and the only activities were some work by correspondence, in 1984 the United States became a participating member of ISO TC130. The secretariat for the United States Technical Advisory Group (USTAG) was the National Association Photographic Manufacturers (NAPM), with Mr. Walter (Walt) Irving as the secretary. The records do not show how or why this happened, but there we were. Walt had no graphic arts background or experience, nor did the NAPM membership. In late 1984 or early 1985, Walt contacted Frank Benham, who by this time was at American Color in Phoenix, and he agreed to be chairman of the USTAG and to collect input from the graphic arts industry to respond to any actions or ballots.

ANSI Activities

It was also in 1985 that Roland (Rollie) Zavada of Kodak became the Chair of the ANSI Image Technology Standards Board. In that role, one of the challenges he took on was to determine if industry support could be

developed for standards in the graphic arts. ANSI was concerned about the total lack of any formal standards activity in such a large industry sector. Rollie turned to Chuck Rinehart and me (at Kodak) for help in understanding the graphic arts industry, and some of the issues around standards and the graphic arts. (This was a marvelous opportunity for me — I learned more about standards from Rollie than I taught him about graphic arts.)

During 1985 and early 1986, Rollie contacted many of the industry trade associations to discuss the need for, and interest in, a standards organizational structure for the graphic arts industry. In response to some of these discussions, and to show interest in the need for graphic arts standards, the International Prepress Association (IPA) became a member of ANSI and a member of the ITSB.

As a result of the interest that Rollie saw within the industry, an open meeting was scheduled to follow the 1986 TAGA Annual Technical Conference at Valley Forge, PA. Rollie also agreed to make a presentation at the TAGA Conference (Zavada, 1986a) outlining his thoughts. The open meeting was attended by more than 75 people. Although there were some dissenting voices, the attendees expressed near unanimous endorsement for the creation of an accredited graphic arts standards coordinating committee that would serve as an umbrella under which graphic arts standards could be developed (Za vada, 1986b). Based on this endorsement, Rollie began the task of creating what was to become ANSI CGATS (Committee for Graphic Arts Technologies Standards).

At the same time, the DDES Association was looking for a Standards home. Rollie connected with Tom Dunn and provided guidance and support to the DDES Association. The National Printing Equipment and Supply Association (NPES) was represented at the open standards meeting by Kip Smythe. During these meetings NPES agreed to accept responsibility as the secretariat for an ANSI committee to support the work of the DDES Association. This opened the way for the accreditation of what subsequently became ANSI Committee IT8.

During the ANSI reviews leading to accreditation of IT8, considerable debate took place between the groups involved in information systems (computer) technology, and the applied technology groups that used the computer as a tool. The key point of these debates revolved around the question of who was in the best position to establish the needed standards — those that developed the computer technology, or those that developed the implementations that used the computer technology.

The application view prevailed, and final accreditation of IT8 was received in 1987. The initial chairman of IT8 was Frank Benham, with Tom Dunn continuing in his key role of managing (and driving) the technical development work, as chairman of the Technical Subcommittee. On July 5, 1988 the first IT8 standard—IT8.1-1988, *User Exchange Format (UEF00)*

for the Exchange of Color Picture Data Between Electronic Prepress Systems via Magnetic Tape (DDES00), was approved by ANSI and by the end of 1988 the second IT8 standard, IT8.2-19889 *User Exchange Format (UEF01) for the Exchange of Line Art Data Between Electronic Prepress Systems via Magnetic Tape (DDES00)*, was also approved.

One of the more unusual aspects of the IT8 committee was the international makeup of its participants. Although all of the companies participating had US divisions, many of the parent companies and actual technical participants were from other countries.

While IT8 was pursuing these initial standards and its accreditation, CGATS was also getting organized. The founding meeting of CGATS was held on May 14, 1987. At the September 1987 meeting Richard Fisch of 3M was elected chairman and Al Materazzi of NAPL the Vice Chair. NPES had also agreed to be the secretariat of this proposed ANSI accredited standards committee and the necessary ANSI application process was started in parallel with the accreditation of IT8. Final accreditation of CGATS was received in May 1989.

Industry Activities

While the accredited standards process was getting itself organized, various industry groups were also forging ahead. One activity that was particularly significant was the introduction of halftone input for gravure. Clearly the availability of electronic color scanners, and the tone scale manipulation available as halftone output, was not benefiting gravure printing. To take full advantage of the new equipment in prepress, gravure had to accept halftone input.

Within a very short period of time, in the 1982-84 time frame, the GTA Standards Committee through the halftone gravure study group developed specifications to allow the gravure publication industry to convert almost completely from continuous tone to halftone input. The summer 1983 GTA Bulletin (Anonymous, 1983) published the preliminary proposals and foundation for halftone gravure input standards. This also paved the way for input into the gravure electronic engraving process of data intended for halftone printing. Another effect of this step was that both gravure and offset publication printers could accept the same input — either as data or as separation films.

TC130

The approval of the initial IT8 standards, the international nature of the graphic arts equipment manufacturing business, and the large international participation in IT8, emphasized the need to move this work into an arena that had international applicability. However, TC130 had not met since 1980, the secretariat had been moved from France (AFNOR) to Germany (DIN) in 1986, and there was no active work ongoing.

To the US standards community, the logical step was to try to get ISO/TC130 reactivated and introduce electronic data exchange as a new work item. In late 1988, Tom Dunn, Rollie Zavada, and I took on the responsibility for coordinating that task. Frank Benham immediately (and arbitrarily) appointed me chair of the USTAG for TC130. His excuse was that this would give me more clout — I'm not sure about the clout, but it did throw me into the middle of all of the formal negotiations with DIN and ISO regarding the reactivation of ISO/TC130. Shortly after this we moved the secretariat responsibility to NPES. (I continue as the chair of the USTAG and NPES as the secretariat.)

After considerable discussion and negotiations, DIN agreed to schedule a reorganizational Plenary meeting in early summer of 1989. Much to our surprise, when the meeting announcement arrived, it called for the meeting to convene on the morning of July 4th in Berlin, Germany. We were not sure if the date was a prognostication of things to come or not, but we went anyway. That initial meeting included representatives of Austria, Belgium, Finland, Germany, Italy, Japan, Norway, Saudi Arabia, Sweden, Switzerland, United Kingdom, and the United States. As chairman of the USTAG, I was head of the delegation. The United States participants in that reactivation meeting of TC130 were:

Frank Benham	American Color/IPA
S. Thomas Dunn	Dunn Technology Inc.
Patrice Dunn	Dunn Technology Inc.
Eric Gutwillig	Agfa Corporation
Richard Fisch	3M Company
B. W. Lavery	E. I. DuPont Company
David McDowell	Eastman Kodak Company
Norman Newman	3M Company
William K. (Kip) Smythe	NPES
Gregory Tyszka	GAA
Roland Zavada	Eastman Kodak Company

In that meeting, the US proposed a Working Group structure with responsibility for conveners and vice conveners of working groups assigned

to national bodies. This was "not according to ISO traditions" but after considerable negotiating we prevailed. The initial TC130 Working Groups (WG) and associated responsibilities were:

	Area of Responsibility	Convener	Asst. Convener
WGI	Nomenclature	Germany	UK
WG2	Prepress Data Exchange	USA	Japan
WG3	Process Control	Germany	USA
WG4	Media and Materials	Switzerland	Germany
WG5	Ergonomics and Safety	USA	Norway

The United States assignments were Tom Dunn for WG2, Greg Tyszka for WG3, and Kip Smythe for WG5.

Throughout these discussions two of the key players were Tom Dunn and Rollie Zavada. Tom had the broadest graphic arts technical background of those present (and had the widest international exposure) and Rollie was the political expert. The US Delegation had taken Rollie along as our parliamentarian and ISO strategy expert. It served us all well as Rollie was the ultimate expert in ISO policies and procedures — what should be done, what shouldn't be done, and most importantly how to use the systems to do what needed to be done.

The work item proposals assigned to the individual working groups were largely contributed by the United States, although there was excellent support and discussion from the other national body representatives. The US proposals came from the work of both the ANSI IT8 Committee and the fledgling CGATS Committee. In addition to agreeing that all five of the initial IT8 (IT8.1 through IT8.5) standards should be work items of WG2, the Plenary agreed to fast track the existing and draft ANSI versions of these standards as proposed ISO standards.

ANSI IT8 Activities

The initial IT8 standards push was to move the work started by DDES into the formal standards arena. This was totally focused on electronic data exchange. However, the committee quickly realized that just being able to move data was not enough. We needed to be able to assemble this data into completed jobs (partial pages, pages and/or multiple pages) and equally important, to define the meaning of the data in terms of the printing results expected. This led to work on a series of standards known as IT8.7 that defined input scanner color characterization targets, and a CMYK data set for printing characterization. There was also considerable work done towards developing page assembly models.

The scanner calibration targets developed by IT8/WG11(that I was privileged to chair) represented a significant accomplishment. These targets

were modeled on the Kodak Color Reproduction Guides, Q60, that were already in the marketplace. Representatives from all of the film companies (Kodak, Fuji, Agfa, Konica, 3M, and Polaroid) and all the major color scanner manufacturers (Hell, Crosfield, Scitex, Screen) actively participated. Targets made in accordance to the standards developed *(IT8.7/1-1993, Graphic technology — Color transmission target for input scanner calibration* and *IT8.7/2-1993, Graphic technology — Color reflection target for input scanner calibration)* have become a key building block for both scanner calibration and color management systems. A conservative estimate is that over 200,000 targets, meeting the requirements of these standards, have been manufactured and sold to date.

At the same time, the IFEN Committee (InterCompany File Exchange Network) had been formed between Crosfield, Scitex, and Hell and they were starting work on a complete data network approach to interconnect their equipment both between sites and within sites. One by-product of this that was provided to the IT8 committee was the media independent file structure that was based on the Aldus TIFF tagging concept. This eventually became the IT8.8 standard which is called *IT8.8-1993, Graphic technology — Prepress digital data exchange — Tag image file format for image technology*

Meanwhile, the International Association of Diemakers and Diecutters came to the IT8 committee with a request to assist them in a data exchange standard for die cutting information. The restricted version of the IT8.3 standard for vector data, which is based on the IGES (Initial Graphics Exchange Specification) standard, was almost tailor made for their application. This became *IT8.6-1991, Graphic technology — Prepress digital data exchange—Diecutting data.* Although it is probably the least known of the IT8 standards it is also probably one of the most widely adopted. Current estimates are that over 100 companies have adopted IT8.6 and are using it in their die cutting equipment offerings.

In 1990, on his retirement from American Color, Frank Benham resigned as Chairman of IT8. Paul Hanson (Hanson Graphics) was elected Chairman and Tom Dunn (DTI Inc.) was elected Vice Chairman serving until the merger with CGATS in 1995.

ANSI CGATS

ANSI CGATS continued to be a key player in the standards development process. It coordinated graphic arts input into other standards groups and more importantly provided an umbrella for moving industry specifications into standards. Typical were *CGATS.7-1995, Graphic technology — Pallet loading for printed material,* which was a joint activity with the Research and Engineering Council of the Graphic Arts Industry, and *CGATS.6-1995, Graphcc technology—Specifications for graphic arts printing—Type 1,* which was a cooperative effort with SWOP.

In January 1995, the programs of the IT8 Committee were merged into CGATS to streamline the administrative process — many of the same people were involved in both committees. The IT8 designations are being maintained on all of the standards developed under IT8, but all new standards are carrying the CGATS designation.

In 1994, in response to a suggestion from Frank Benham, CGATS created the Roland Zavada Standards Award, commonly referred to as the "Rollie". The intent of this award is to recognize the significant contributions of an individual toward the development of US graphic arts standards. The name was chosen to recognize the contributions made by Rollie in organizing and creating the structure for both the US and international graphic arts standards activities. Tom Dunn was the unanimous choice as first recipient of this award, which was presented to him at the IPA Annual Technical Conference in May 1994.

Industry Activities

Two industry groups were created in the early 1990s in direct support of the standards activity. These were OSCA (Open Standards Color Association) and the DDAP (Digital Distribution of Advertising for Publications) Association. Tom and Patrice Dunn were strong participants in both these activities and provided much of the creative thinking that enabled them.

The inaugural sponsors of OSCA were Agfa, DuPont, Fuji, Kodak, Radius, and 3M. The goals were to provide support within the graphic arts industry for the testing and implementation of the color related standards that had been, and were being, developed within the accredited standards community. The key issue was to encourage the industry to put aside issues of short term gain in the interest of the long term growth (and efficiency) of printing and publishing.

The DDAP Association grew out of discussions at the 1990 Lasers in Graphics/Electronic Design in Print Conference (Dunn, 1990) and has been a user driven organization. It has focused on (1) developing a consensus set of user requirements for the digital distribution of advertising, from primarily the agency and publisher perspective, and (2) on testing the various implementations of standards offered by manufacturers. It has also played a key role in educating the advertising and publishing community about the advantages of standards, and in providing a unified voice for this community in dealings with hardware and software manufacturers. CGATS/SC6 was created to provide standards development in response to the requirements defined by the DDAP Association.

Where We Are Today

Today, the printing and publishing industry has clearly evidenced its support of both industry specifications and accredited standards. This is demonstrated by its support of conference sessions and articles devoted to standards and in response to various surveys. In addition, many of the trade associations now have standards committees. There is also a new openness in cooperative efforts between industry groups, consortia and the accredited committees. The initial support for, and involvement in, the accredited standards activities has come from the vendor technical community at both the ANSI and ISO levels. Not surprisingly, a very high percentage of these participants have also been members of TAGA. The TAGA Annual Technical Conference has also been the venue of choice for publication of much of the technical background material developed in support of the standards activities.

The growing involvement of the user community has been encouraging. This is an important component, needed to assure that standards are not only technically correct but also practical, useable, and meet a real need. The IPA and GAA, in particular, have been strong supporters of these activities.

I will only touch on some of the highlights of the current status — anything more would be a paper in itself. Those interested in more information on present activities are urged to contact:
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ANSI Activities

NPES is the secretariat for B65, CGATS, TC130/WG2, and the USTAG/TC130. These committees are all active and healthy. The work of CGATS and the US support of TC130 is being integrated to minimize overlap and/or conflicts. All TC130 documents are circulated to one or more of the CGATS SCs in addition to the members of the USTAG.

Although NPES and IPA are the only two graphic arts organizations represented on the ANSI Image Technology Standards Board, in 1994 Kip Smythe of NPES was elected chair of the ITSB. In addition, a number of the company representatives bring a graphic arts background—this is a real turn around in involvement and interest by the graphic arts in a ten year time span.

Within CGATS the relationship with industry groups has also continued to grow to the benefit of both. A significant accomplishment occurred in the fall of 1995 with the publication of the first CGATS Technical Report, ANSIICGATS TR 001-19957 *Graphic technology — Color characterization data for Type 1 printing*. This technical report, and its companion standard CGATS.6, is the outgrowth of the cooperative effort between SWOP and CGATS to prepare and measure physical printed samples produced as close to the SWOP aims as possible. The data contained in this report is the first publicly available colorimetric characterization data for a major printing process. It has the endorsement of both SWOP and CGATS and is the perfect example of cooperation between an industry group and a standards committee.

CGATS is also in dialogue with many of the other industry groups interested in specification and standard practices. In the area of printing these include Flexographic Technical Association (FTA), Screenprinting & Graphic Imaging Association International (SGIA), Gravure Association of America (GAA), the SNAP Committee, and Graphic Communications Association (GCA).

The current CGATS organization is:

Main Committee
- Executive Committee
- SC1 Terminology
- SC2 Plates
- SC3 Densitometry
- SC4 Process Control
- SC5 Materials Handling
- SC6 Digital Advertising Exchange
- SC7 Data Exchange
- SC8 Color Data Definition

As of this writing there are 18 CGATS (and IT8) standards in place and another 7 in the development/approval process.

Following Dick Fisch and Al Materazzi the officers of CGATS have been:

	Chairman	Vice Chairman
1991-1993	David McDowell (Kodak)	Tom Basore (PIA/WOA)
1994-1995	Tom Basore (PIA/WOA)	Gerd Koehler (Quebecor)
1996-1997	Bruce Shifrin (Dianippon Screen)	Walt Zawacki (Flint Ink)

A key project in the current CGATS program of work is the development of standards to allow the exchange of completed work in electronic form. These standards must satisfy the needs of the DDAP requirements definitions

and will also find applicability for material beyond advertising. It is important that these exchanges be enabled between both CEPS (raster based systems) and DTP (desk top publishing) systems. These activities are Ibuilding on a combination of the TIFF/IT (IT8.8 and ISO 12639) standard and an implementation standard for graphic arts use of the Adobe Portable Document Format (PDF). This latter step is possible because the Adobe PDF is a publicly available format specification.

ISO Activities

The work of ISO/TC130 has continued to progress and accelerate. The Chairman is Dr. Friedrich Dolezalek of the German graphic arts research institute, FOGRA. The work in TC130 is maturing and is incorporating national body work from, in particular, the United States, Germany, and Japan. Other countries are also active and these activities are clearly beginning to allow international communication of graphic arts information. A key difference between the current activities and those of earlier standards activities is that the current focus is on the enablement of communication rather than the strict prescribing of acceptable performance.

Considerable emphasis is being placed on the definition of printed output. A three tiered model is being followed. Under this model the color of the ink in the can is defined in terms of an ink test. This is followed by definition of various standard printing conditions — typically related to the paper being used. This is then followed by the characterization of the printing under those specific conditions with a specific ink. This latter characterization is usually based on the IT8.7/3 *(IT8.7/3-1993, Graphic technology — Input data for characterization of 4-color process printing)* data set or its ISO equivalent ISO 12642 with the same title.

Following the lead of the United States, both the European and Japanese communities are beginning to develop printing characterization data based on this approach, similar to the SWOP characterization in CGATS TR001. In another area, the colorimetric measurement profiles defined first in CGATS.5-1993 and then incorporated in ISO 13655 are being accepted by many other groups such as color fax and the color management groups.

One activity of special interest is the development and approval of the first ISO standard that includes image data in digital form on a CD-ROM as a normative part of the standard. ISO 12640, *Graphic technology — Prepress digital data exchange — Standard color image data (SCID)*, was approved by ISO in 1995. This standard started as a proposal from the Japanese National Body. It was accepted by TC130 with additional images proposed by several other national body groups. The final standard carries both natural images (pretty pictures) as well as test objects such as a rendition of the IT8.7/3 (ISO 12642) data set used for printing characterization. The images contained in this standard have formed the basis for all of the printing

characterization work being accomplished world wide (e.g. SWOP, Japan Color, the FOGRA work, as well as the work going on in SNAP, GAA, etc.).

Although the Working Group structure of TC130 has remained the same the convener and assistant convener responsibilities have changed. The current responsibilities are:

		Convener	Asst. Convener
WGI	Nomenclature	Germany	USA
WG2	Prepress Data Exchange	USA	Japan
WG3	Process Control	Germany	USA
WG4	Media and materials	Germany	USA
WG5	Ergonomics and Safety	USA	

The people currently filling these roles, on behalf of the United States, are David Avery (Anitec) for WGI, Ken Cloud (Cloud Information Systems) for WG2, Larry Warter (Fuji) for WG3, Walt Zawacki (Flint Ink/NAPIM) for WG4, and Kip Smythe (NPES) for WG5.

The Working Groups of ISO/TC130 have continued to meet twice a year, and a Plenary has been held annually in the fall, in conjunction with the Working Group meetings. Since 1992, the Working Groups have chosen to meet together at the same location. The meeting locations have been:

	Working Groups	Working Groups/Plenary
1990	USA/Germany	Dusseldorf, Germany
1991	USA/UK	Chicago, USA
1992	Stockholm, Sweden	Nashville, USA
1993	Munich, Germany	Toyko, Japan
1994	Baltimore, USA	Berlin, Germany
1995	Boston,USA	London, UK
1996	San Francisco, USA	Vienna, Austria

Industry Activities

The SWOP Committee is very active and is keeping up with the changes in technology. In the 1993 revision of the SWOP requirements document, off-press proofing was included for the first time. The concept of "Application Data Sheets" was also introduced to allow the manufacturers of proofing equipment to better specify the proper operation of their product to provide the best appearance match to a SWOP press proof.

SNAP (Specifications for Non-Heat Advertising Printing) and CGATS have begun a dialogue to consider a standard defining the technical aspects of the SNAP printing conditions and development of color characterization data similar to the SWOP definitions in CGATS.6 and CGATS TROOI.

Several subgroups within the GAA Standards Committee are looking at definition and characterization of packaging, publication, and commercial gravure printing. It is too early to know if these will lead to GAA or ANSI/ISO standards. However, this work is following the model of the SWOP/CGATS work and is using the images and measurement procedures specified in the ANSI and ISO standards.

In 1994, an industry consortium was formed to deal with the exchange of color profile data between color management systems. This group is now called the International Color Consortium (ICC). NPES is the administrative secretariat and the technical secretariat is FOGRA. The initial founding members were Adobe Systems, Inc, Agfa-Gevaert, N.V., Apple Computer, Inc, Eastman Kodak Company, Microsoft Corporation, Silicon Graphics, Inc., Sun Microsystems, Inc., and Taligent, Inc. By the end of 1995 the membership had grown to 26 companies. Although it is not a formal standards committee, the ICC has entered into dialogue with TC130 and is preparing their specification in accordance with the procedures for an International Standard.

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