The single most important aspect of the printing industry as it makes the transition to the 21st Century is that it is close to completing an evolution from the craft-based industry of the last century to becoming a completely definable process ready for this new century.

The major driving force behind the printing industry’s transition from a craft-based industry to one that is based on definable processes has been the work on industry standards done by CGATS in the U.S. and by ISO world wide, supported by organizations like IDEAlliance in the U.S. Without the work of a very limited number of dedicated people in these standards and support organizations, the printing industry would be much more vulnerable to the charge that it is an old industry whose time has come. Instead, what is presently happening is that printing is becoming the reference media for defining and reproducing images and pages when various media are brought together in cross-media applications. That is all due to standards.

But it isn’t time to rest on our laurels yet. Some very major issues still need to be resolved before we can claim that we have a controlled process that will guide the way that people view images throughout this century. In recent years, we had thought that we were getting close, as evidenced by successes in color management, process control targets and certified reference materials. ISO and ICC had together developed a clear and explicit standard for color management that has required very little modification. Color management came out of the printing industry, and now most of the work that remains is to apply it to other industries. Second, TC 130 has developed images and targets known as SCID (standard color image data) images, which include the best colors to visually and metrically compare each of the different media used to reproduce an image. There are individual SCID images for colors that appear in the original scene (in the real world), in electronic output (both normal and extended range monitors), in CIELAB space, in XYZ space and, of course, in printed output. Our industry is the best equipped to be able to compare images (both visually and through measurement) across media. And third, Certified Reference Materials were standardized based on two principles. First, meaningful and accurate measurement is essential to an imaging industry such as printing, and second, meaningful and accurate measurement is very difficult to achieve.

To achieve accurate measurements, we must make sure that our instruments are very precise and consistent among one another and, maybe more importantly, accurate and consistent with other instruments. The only way to achieve this is to develop certified reference materials that will give predictable results when properly measured. They are very difficult to make, since there will be some variation in manufacture and the act of measurement itself can and does affect the measured result.

For those who are interested, this standard work deals with the concept of calculating uncertainty (combining all the variables to determine the potential level of accuracy of a process). For the rest of us, we have the resulting perspective that any reported color accuracy under about 0.5 delta E is meaningless and achieving accuracy under 1 delta E is probably too costly for our industry. So with these three standards in place (color management, targets and reference materials), we thought we were well-positioned to drive the industry toward complete control of the process.

Then the standards hit the fan. The problem was that, starting five to eight years ago, paper vendors began slowly increasing the

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amount of fluorescing agents they added to paper to give the appearance of white without the cost of TiO2. This essentially negated all the good work we had done developing color management for our industry because in a comparison of reproductions of the same image, such as proof to press (with at least one being on a fluorescent substrate), the visual comparison does not match the measured comparison unless the amount of UV in the viewing booth and the spectrophotometer source are equal. Historically UV was not exactly defined for either spectros or booths because they didn’t have to be in the TiO2 era. Now with fluorescing agents in the paper and random amounts of UV in viewing booths and spectrophotometers, all color management has been rendered suspect.

TCI30 moved as fast as a standards body could move (which is still not very fast) and addressed the spectros with ISO 13655 and the viewing booths with ISO 3664. There are now good definitions for the UV content in both viewing booths and spectros. So everyone should follow the IDEAlliance/SWOP advice to upgrade their units to match the new standards by the end of 2011 if possible.

But the problem isn’t over! Even when this is done, issues will persist because first, the visual/metric match is achieved only under the prescribed condition (matched proof to press sheets can still vary visually outside the booth) and second, the amount of UV in the stock diminishes with time and exposure to light/heat, so the match will change over time. But at least we are back to having a working color management system when the UV is controlled, and the standards bodies will continue to work on improvements to the process in the future. We also expect that a paper standard, presently under development by a group of paper vendors, will give the industry very good guidance as to what they can and can’t expect from all levels of paper in terms of printability and color in the future. Finally, there is a plan to migrate all measurement in all standards from CIELAB to CIEDE2000. While this is more difficult to use, it fits much better with visual results. Look for more direction from IDEAlliance and other groups to make this transition easier.

Once the technical aspects of measuring and viewing are under control, the next issue is the age-old question: Who is in charge of the process, the printer or the print buyer? The argument is simple. Does the print buyer specify exactly how it wants its images reproduced in one general format for all of its suppliers to match (even across media) or should each supplier limit the supplied ‘prepress’ input from the print buyer to what they can easily and reliably produce? The former results in bringing all the suppliers’ products together visually but tends to result in more variation during production. The latter results in more consistent but divergent interpretations. Obviously the best answer is some compromise between the two. That is what we have in both approaches under discussion in ISO. The 12647 approach favors the printer. Basically it is the same as the old SWOP process control approach, where printing is categorized by the marketplace that it services. It is assumed that there is one standard condition for each marketplace based on a chosen paper and typical ‘density/dot gain’ recommendations for that combination. Each printer is expected to adjust his presses (by adjusting printing curves) to match that targeted condition and, hopefully, the proper representation of the image. We are presently updating the 12647 standard paper/solid color/tone value recommendations for the various process and/or marketplaces, including offset, newsprint, gravure, flexo, screen printing and two levels of proofing.

The 15339 approach favors the print buyer. It is a family of related
characterization data sets derived from the IDEAlliance G7 approach, which uses a three-color gray scale for process control (in order to allow for variations in transparency and trap of the inks). It brings the reproduction of images visually close together, regardless of the data set chosen for reproduction. It works on the assumption that there only needs to be one highlight to mid-tone neutral scale reproduction for all presses, applications and all marketplaces, and that brings the images visually together.

Midtones to shadows can vary for the different marketplace papers and reproductions to give the images more or less range but not change the part of the reproduction scale that people notice. As with the first case, each printer is expected to adjust his presses (by adjusting printing curves) to match one of a set of targeted conditions for their given marketplace that has this neutral scale reproduction. Since all targeted conditions have the same neutral scale, they will be visually much closer together to reproductions in other marketplaces. Those are the two options.

Another major issue that relates to this debate is, how and where does digital printing fits into this whole picture? Obviously, process control is completely different for digital printing, so there is little point in using simulated offset process control parameters as in 12647. But there are some unique aspects of some of the various forms of digital printing that seem to require more than just a need to match the family of characterized data sets in IS339 as the only requirements for digital printing. Based on the work of the IDEAlliance digital printing certification committee along with the FOGRA Digital Printing Group and a Japanese digital printing group, ISO is debating a family of standards that addresses the various types of digital printing. The resulting standards will try to address a wide range of market needs and all types of digital presses. Our intent is to address the needs for all types of digital printing. The resulting standards will try to address a wide range of market needs and all types of digital presses. Our intent is to address the needs for all types of digital printing certification (system, user and product) with a “three levels of quality” approach that can be applied as needed. Much needs to be done.

A quick list of other active standards efforts at present would include:

1. We have two standards that address monitor proofing. One is limited to monitor specification (viewing cone dependency, luminance, etc.) for use in the graphic arts. The second standard includes how to use a properly set up monitor for proofing.

2. Control of PDF was also given to ISO by Adobe several years ago. This has resulted in all the printing versions of PDF/X and PDF/A (for archiving documents). This is yet another example of printing leading other industries, and we are presently looking for any new market needs.

3. We have just finished work on the definitive standard for variable data PDF/VT. It promises to be so effective in addressing variable data needs that it was awarded an Intertec Award, the first standard to be so recognized.

4. There is a new standard for Preparation and Visualization of RGB Images. This is an attempt to use the RGB format to define the customer’s visual expectations as was historically done with the photographic transparency. Many issues still need to be resolved.

Finally we began three new initiatives this year that broaden the standards horizons and will offer the opportunity for a more diverse set of experts to become involved.

1. **Environmental Impact of Printed Products.** The goal is to take the general guidelines for establishing the “carbon footprint” of products as determined by ISO and specifically apply these to printed products. Led by England, there are some dedicated if inexperienced people
working their way through this process and, at the very least, it should result in some numbers that can be used by printers to establish their environmental impact. More importantly, especially for printing, is that experts are somewhat optimistic that once this impact is properly determined, printing may compare very favorably with electronic media. After all, printing’s environmental impact happens only at manufacture and disposal and does not increase every time our product is viewed as with electronic media. Wouldn’t it be interesting if the environmental impact of the printed page turned out to be less than the same page viewed a normal number of times on electronic media? It wouldn’t turn the world around, but it would sure give us something to brag about.

2 POSTPRESS. Postpress was also established during the past year. Chaired by China, the major issue with Postpress is that, while everyone acknowledges that it is very important, it has very little technical crossover with the other standards in TC 130. As a result, expertise is lacking. We need experts who can help determine what is important to standardize and the best ways to standardize that information. These experts do not have to travel to meetings, although that would be best, but we at least need people from the U.S. delegation who can read and critique the postpress standards as they are written. Volunteers should contact IDEAlliance or NPES.

3 CERTIFICATION REQUIREMENTS. The most recent effort is Printing Certification Requirements. It will address the need around the world to unify the goals, tolerances and especially the procedures of various certifying bodies such as IDEAlliance as they advance from the basic certification of proofs to more detailed certification of all aspects of printing, including the various print processes themselves. While we initially thought this would be a relatively easy process based on the work that had been done by IDEAlliance, FOGRA, etc., we soon found out that we had to develop a much deeper understanding of the whole concept of certification, what it is and what it can’t be. First, certification must be separate from the process/product standard. The process/product standards should only describe how the process and/or product is done, but they cannot mandate that people do it that way. A separate standard is needed to define how certification can be done. Second, this separate standard must address all three levels of certification: self certification, contracts between a supplier and their customer and independent third party certification. Since all three happen in the marketplace, the standard must allow each to happen and only give guidance as to the best way to institute certification. While this does lead to more relaxed enforcement of certification, it prevents one person or group from legally limiting another person or group. They can cite the proper standards, but the individual certification bodies themselves must provide the power to enforce them. When you think about it, this is only right, and the standards have to gain and maintain their authority by being the best way to describe a process/product and not the only legal way. It will keep us on our toes.

There are also separate standards efforts for:

- Safety, which, in its early years prevented OSHA forcing our industry to Lock out/Tag out for all printing operations and essentially shutting down our industry!
- Terminology, which has been developing an electronic data base of definitions to serve the whole industry.

In summary, a lot is happening and it is safe to say that standards, with support from groups like IDEAlliance, is where the action has been and will continue to be as we drive our industry the final steps from a craft to the predictable, automated process that will make printing the reference media of the future.