CHAIRMAN’S MESSAGE

Hello Everyone,

I trust that you enjoyed the many pleasures of autumn…the beginning of football season, the beautiful continuum of color in the leaves and the sensational CAD RETEC® Conference "Remember the Color" that Jim Figaniak and his committee Chaired in San Antonio. As always, the program was filled with an array of informative technical presentations and back by popular demand, the New Technology Forum. The final attendance count was 387, along with 56 tabletop exhibitors. I personally wish to thank the following (18) companies for their generosity in sponsoring our annual event and making it possible to add the "extras" because of their continued support: Clariant Corporation, BASF Corporation, DuPont Titanium Technologies, Eckart America, EMD Chemicals, LTL Color Compounders, Nubiola, Shepherd Color Company, Sun Chemical, Tronox, A. Schulman, BYK Gardner, Dominion Colour, Ferro Corporation, Konica Minolta, Lanxess, Ribelin Sales and Standridge Color Corporation. I would like to mention that the CAD Board continues to commit to using a portion of the proceeds from all RETEC® conferences to enlarge the Endowment Fund so that we can increase the number of scholarships we offer annually in our industry.

This year, for many of us, the highlight of RETEC® was having the honor of Susan Golding (Terry Golding’s Wife), Shelly Palashewski and Sherri Zimmerman (Terry Golding’s daughters) with us to make the presentation of the First Annual "Terry Golding Outstanding Achievement Award" during the RETEC® Awards Luncheon. The CAD Board voted to name this award after Terry Golding to serve as a lifetime tribute of recognition to his unending contributions to the CAD Board and the plastics industry. It was a pleasure to have the opportunity to forge new friendships with these three phenomenal ladies. We truly appreciated their participation. It was very fitting that because Terry was instrumental in the establishment of our CAD website (www.specad.org) that the award was presented to Joe Cameron, Sharon Ehr and Tracy Phillips who represent our CAD Website Committee. We are very proud of the hard work that Joe, Sharon and Tracy dedicated in giving our website a major transformation into a very user friendly, updated and powerful tool for our membership, over the past year.

continued on page 2
EDITOR’S NOTE

Hello to all;

It is hard to believe that it is almost the end of another year! Time sure flies . . .

In this issue, there are several great technical articles and some candid shots from the past RETEC® conference in San Antonio. I think everyone will find both to be interesting and entertaining.

Beginning next year, we will be phasing out the printed newsletter in favor of an all electronic version. The costs of printing and mailing the newsletter have risen dramatically over the past several years. The newsletter will be delivered in a PDF format for easy viewing. Email links will be sent to all members with up-to-date email addresses. The newsletters will also be posted in the Communications section of the CAD website (www.specad.org).

This will also be my final issue as editor of the newsletter. Jamie Przybylski of Terra Community College will be taking over the responsibilities for next year. I have really enjoyed this experience and wish Jamie all the best.

Have a happy and safe holiday season . . .

Sharyl M. Reid
CAD BOD Chairman

Quickly approaching is that time of year in which we will be requesting your vote on the upcoming ballots for the new board members so that they will be ready to take their positions at the summer board meeting. This event typically takes place in February and March of each year. If you are interested in running in the election, please contact Tracy Phillips at tracy.phillips@cibasc.com by January 1st, as she will be handling the elections this year and will be happy to walk you through the process. Both I and the CAD Board would like to strongly encourage your participation in the voting process, as well as, consideration in running in the election.

Wishes to All of You for a Safe and Joyous Holiday Season!

Barb Parker
Editor

PRESIDENT’S MESSAGE continued from page 1

The following is a short trip down memory lane for all you RETEC® cow pokes.

Many thanks to Joe Cameron for his camera quick draw. Enjoy!

Welcome to the Alamo!

Registration

Dudes, GREAT Shirts!
Quality Pigments Producer In China

CINIC Chemicals (Shanghai) Co., Ltd. is located in Shanghai, China. The company is ISO 9001 certified. It develops, manufactures and markets organic pigments for the applications in the industries of paints & coatings, plastics and inks.

Currently its product range includes DPP series high performance organic pigments.

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- Standard red pigment for plastics
- Brilliant shade with excellent all-around properties
- For polyolefins, PVC, PUR and many other polymers
- Cost effective

### Regulatory Compliance

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### Heat Resistance in HDPE

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Tel: +86 21 52400178 Fax: +86 21 52400136
www.cinic.biz
A *Perfect Red* and *Blue* are two books that show how, more than any other colors, red and blue came to dominate Western culture. But when you pick up *Mauve*, you’ll learn how the history of both red and blue was changed forever by its invention, which turns out to be so much more than just the combination of the two.

*A Perfect Red* by Amy Butler Greenfield is the story of the cochineal, a small insect that lives on the leaves of the nopal cactus. Cochineal bugs, when crushed, yield a bright red dye, a rare commodity when the color was reaching its peak of popularity. Because the cochineal flourished only in the New World, and Spain at the time had a lock on that location, cochineal became a key part of the Spanish economy.

The citizens of various other European countries tried to help themselves to some of this truly extraordinary pigment. English pirates seized Spanish ships loaded with cochineal and reaped substantial financial rewards; a daring young Frenchman managed to secure some live cochineal and tried to set up a colony. Meanwhile, Dutch scientists were trying to determine what exactly a cochineal was. *A Perfect Red* is a detailed, well-researched recounting of red’s long and occasionally bloody history. Reading it may give you new insight into the source of red’s power and drama.

*Blue* by Michel Pastoureau has a more personal feel. Pastoureau, a French academic, tells of blue’s rise in fame, from its inauspicious beginnings as a color of “nothing, or at least very little”, to its current spot as the most popular color in the West. Pastoureau is a confident writer, rigorous and precise, and his assertions are proudly patriotic and often provocative.

While blue was an important color for the people of ancient Egypt and the Middle East, it was pretty much completely disregarded by European cultures of antiquity. The Greeks had no word for blue, simply referring to it as “dark”; the Romans associated blue with their enemies, the Celts, and did not make much use of it in art or daily life. It wasn’t until around the 11th Century that blue began to rise in popularity. Much of this can be attributed to the new practice of depicting the Virgin Mary in blue robes.

But Pastoureau really hits his stride with the story of the adoption of red, white and blue for the French flag during the revolution of 1789. It’s almost as if Pastoureau is claiming the color blue itself for the French; he’s that passionate about its role in French history. Whether you agree with him or not, Blue is a terrific read, enlivened by full color illustrations throughout.

*Simon Garfield’s Mauve* is a much cooler story, a tale of scientific inquiry, felicitous discovery and business acumen. It’s the story of William Perkin, a young British chemist who studied at the Royal College of Chemistry in London. In 1856, while at home on Easter holidays, Perkin was messing around with aniline when he made an unusual discovery. Through a simple process of distillation and oxidation, he created a new form of dye. Perkin dipped a silk cloth in the dye and produced a beautiful, lustrous mauve color that did not fade with washing or exposure to light. The dye became known as Perkin’s purple, although Perkin himself called it “mauveine.”

Mauve became an incredible fashion trend, set off by the French Empress Eugenie, wife of Napoleon, who had decided that mauve matched her eyes. In January 1858, Queen Victoria wore a mauve gown to the wedding of her daughter, and sparked a major mauve mania. Perkin went on to develop other colors and processes, and made a fortune. But patent issues, lawsuits, and concerns over safety eventually sapped his energy for the business, and at 35, he sold Perkin and Sons and retired, a wealthy and famous man.

*Mauve* contains a significant amount of detailed research, yet it remains an easy and fluid read. It’s wonderful to think that a simple desire for color could lead to so many momentous discoveries.
INVITATION TO ATTEND OUR CAD BOARD MEETINGS

The Color and Appearance Division regularly holds Technical Program Committee (TPC) and Board of Director (BOD) meetings at the ANTEC™ and the RETEC®. In addition, a Summer BOD and TPC meeting are typically held about 6 weeks prior to the RETEC®, and a Winter BOD and TPC meeting are held in early January. The Summer meeting is scheduled in various locations, the Winter meeting is typically held at the site of the RETEC® that is a year and a half away.

Any SPE/CAD members who wish to attend are welcome at these meetings. Contact the Division Chairman (see the back cover) for information on the location and times of any of these meetings.

Disclaimer:
The information submitted in this publication is based on current knowledge and experience. In view of the many factors that may affect processibility and application, this data/information does not relieve processors from the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom this information is supplied to ensure that any proprietary rights and existing laws and legislation are observed.
OPENING/WELCOME (DAVE JOHNSON)
Dave Johnson welcomed everyone to the meeting. He noted that Terry Golding would be receiving the Honored Service Member award over the phone today.

SECRETARY'S REPORT (HOWARD KENNEDY)
There was a motion to accept the minutes from the September 20th meeting. The motion was seconded. Minutes of the last meeting of October 2006 were approved.

TREASURER'S REPORT (BRUCE MULHOLLAND)
Total ending balance for 2006 was $134,225.67 with the Endowment fund balance at $288,500.56. RETEC 2006 earned a net amount of $81,597.73. A motion was made to accept treasurer’s report as written. Motion accepted.

The annual report will be audited by the finance committee. The starting balance on the annual report on July 1st, 2004 was $249,095.20. The endowment fund entry on line 15 moves it to the endowment fund allocation. The ending balance on the annual report ending on June 30, 2005 was $337,035.25 (including endowment fund total). A motion was made to accept the treasurer’s report, second motion was made, and all in favor passed it.

COUNCILOR'S REPORT (AUSTIN REID)
No Council meeting since last BOD meeting therefore no report was submitted. The next Council meeting is January 27. Ms. Davis will proxy for Mr. Reid at the upcoming council meeting.

ANTEC™ TECHNICAL PROGRAM COMMITTEE
BRUCE MULHOLLAND
ANTEC™ 2007 (Cincinnati, OH) – Scott Heitzman
Kathryn Brannon
Schedule is still to be confirmed. CAD will have one session with 6 papers (am Tuesday, May 8 requested). CAD and PMAD will share a joint session with 6 papers as well (pm Tuesday, May 8 requested). The CAD business meeting and CAD/PMAD joint reception to be held after the sessions.

The BOD meeting is tentatively scheduled for Monday, May 7. Ms. Brannon made a motion that CAD would contribute up to $2000 for a joint reception with PMAD. The motion was seconded by Ms. Davis and accepted. B. Mulholland made a motion to provide up to $2000 to ISPE for ISPE student sponsored travel as per the budget. The motion was seconded and accepted. Mr. Mulholland made a motion to provide $5000 to the SPE Foundation. Mr. Rangos seconded the motion. The motion was accepted. Mr. Goldstein made a motion to provide up to $2000 for Terra student travel and accommodation to attend ANTEC™ 2007. Mr. Charvat seconded the motion. The motion was accepted.

ANTEC™ 2008 (Milwaukee, WI) – Ann Smeltzer & Marty Paisner
It was reported that there has been no action yet.

ANTEC™ 2009 (San Antonio, TX) – Roger Reinicker / Tracy Phillips
No action to report.

ANTEC™ 2010 (Orlando, FL) – No action to report.

ANTEC™ 2011 (Boston, MA) – No action to report.

RETEC™ Technical Program Committee (Sandra Davis)
RETEC™ 2006 Cincinnati, OH) – Scott Heitzman
Scott was thanked by the BOD for the excellent job done for RETEC™ 2006.

A logo has been selected. There will be a golf outing, a fun run/walk and a visit to the zoo/aquarium has been scheduled. Details are being confirmed with the hotel. The food budget is approximately $40,000. A new products forum is scheduled for the Tuesday.

RETEC™ 2008 (Detroit, MI) – Aram Terzian Oct. 18-20, 2009
The Detroit Color Council (DCC) has been contracted and has agreed to assist with local advertising and paper generation in return for a ‘head tax’ of $50 per DCC attendee and an exhibit table. Joe Cameron has agreed to act as Technical Program Chairman.

RETEC™ 2009 (Savannah, GA) – Bruce Mulholland
Negotiations have been finalized with the hotel. The dates have been moved to Oct. 18-20, 2009 in order to avoid any conflicts with religious or national holidays. The rate has been set at $169 at the Hyatt for 760 room nights. The contract has been reviewed and approved by Leslie Kyle. Additional rooms at the Hampton Inn are being considered as well.

RETEC™ 2010 Nashville, TN Sept. 12-14, 2010 – Brian West
EDUCATION COMMITTEE (BOB CHARVAT & JAMIE PRZYBYLSKI)
Mr. Charvat stated that there has been little activity in the Clearinghouse. Terra has launched their Distance Learning Program and currently has 25 students. The current Dean is retiring and a search is underway for a new Dean. Work on Volume II of the Color Technology book will resume shortly. It was noted that a recent article in the November issue of Plastics Engineering concerning color was published with numerous errors and inaccuracies. The article did not go through any peer review process. Mr. Charvat has agreed to prepare and submit a letter to the editor with copies to S. Oderwald and the ISPE Publications Committee Chair detailing the inaccuracies and offering to implement a review process for articles concerning color. ISPE has requested that CAD to supply web seminar on color. Jack Ladson volunteered to present the ‘Colorants for Plastics’ presentation.

RETEC™ PAPER ARCHIVE (TRACY PHILLIPS)
All books have been received by Omnipress and are currently being scanned and compiled. Completion is expected by ANTEC™ 2007.

CAD TAG LINE CONTTEST (TRACY PHILLIPS)
200 tag lines were submitted and 14 were selected for review by the BOD. Tracy will supply the tag lines electronically to all of the board members to vote on 3 tag lines.

continued on page 8
NEWSLETTER COMMITTEE 
(BARB PARKER) Dave Johnson reported that the newsletter has been sent out electronically.

CAD WEB-SITE (JOE CAMERON & TRACY PHILLIPS) 
The new website has been completed and populated and is ready to be launched. Mr. Johnson will advise, Mr. Cameron to complete the process to launch the new website.

ENDOWMENT COMMITTEE 
JOHNNY SUTHERS 
Submission dates for scholarship applications will be June 2007

AWARDS COMMITTEE (TERRY GOLDFING) 
The ISPE Awards Committee has unanimously approved the Honored Service Member Award for Terry Golding. The award will be presented via a conference call after this CAD Board meeting.

PUBLIC INTEREST COMMITTEE (GARY CONRAD) 
Mr. Conrad has resigned this post due to a job change. Ms Brannon volunteered to complete the survey information from RETECE™ 2006 and to put the survey together for RETECE™ 2007.

COLOR ADVISORY GROUP (BRIAN WEST) 
There have been no requests for assistance submitted.

INTERNATIONAL COMMITTEE (BRIAN WEST) 

MEMBERSHIP COMMITTEE (ROGER REINICKER) 
No report submitted.

DIVISION/SECTION TECHNICAL RESOURCE COMMITTEE (STEVE GOLDSTEIN) 
Presentation has been completed with disclaimer and will be submitted for uploading to website. Mr. Goldstein will email a list of possible topics for the next project to the BOD.

PLASTIC MUSEUM COMMITTEE (BOB CHARVAT) 
Several requests for ideas and/or donations for a display at the Plastics Museum have been made but no responses have been received.

OLD BUSINESS (ALL) 
Reviewed and updated existing action item list. Mr. Charvat moved that the remaining $5000 that is budgeted for Terra be released. The motion was seconded by Sandy Davis and accepted.

NEW BUSINESS (ALL) 
Earl Balthazar and Scott Heitzman were nominated for the position of BOD Secretary. Earl Balthazar was elected. Mr. Johnson requested that all Executive Chairs confirm their acceptance of their new positions effective at the end of the ANTEC™ 2007 BOD meeting. All Executive Chairs confirmed. It was moved, seconded and accepted that the meeting be adjourned.

UPCOMING BOARD MEETINGS: 
2007 Spring Cincinnati May 7 (tentative) 
2007 Summer August TBA 
2007 Fall San Antonio October 3, 2007

ACTION ITEMS

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<th>Item</th>
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<th>Status</th>
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<td>Post together a list of items needed for the Plastic Museum and send to Barb Parker to put in the next CAD News issue.</td>
<td>Bob Charvat</td>
<td>November 1, 2006 complete</td>
</tr>
<tr>
<td>Send Tech Resource Presentation for review and comment to CAD BOD.</td>
<td>Steve Goldstein</td>
<td>October 31, 2006 complete</td>
</tr>
<tr>
<td>Send all items regarding material and dates for RETECE to Sandy Davis.</td>
<td>CAD BOD</td>
<td>November 1, 2006 complete</td>
</tr>
<tr>
<td>Review and writeup the disclaimer from Steve Goldstein.</td>
<td>Bob Charvat</td>
<td>November 1, 2006 complete</td>
</tr>
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Mailing List: 
From Summer 2007 CAD BOD Meeting Assigned To: Sue Status: Complete 
Possible policy concerning paid attendance for education (i.e. free registration) | Dave Johnson | Complete |

Scanning of historical papers at ISPE (celebrity with B. Dave | Complete |

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In the twentieth century, interior design choices were largely the domain of women - which may explain pastel floral couches and mauve carpeting. When guys did have a say, their spaces were predictably clad in sturdy shades of brown or forest green.

Justine Blanda-Wengrod still sees those preferences in her Los Angeles-based residential interior design practice. "Men seem to gravitate to deeper, richer colors. Most women like pale, soft hues."

Joel Sanders, principal of Joel Sanders Architect in New York and Associate Professor of Architecture at Yale University, also sees gender playing a part in color selections. Guys are "a little fearful of colors that are traditionally feminine," such as purple, lavender or pink. But, Sanders cautions, context matters. Centuries ago, pink was considered masculine and popular in men's clothing. Today's metrosexual men have once again embraced pink as a fashionable clothing choice.

But when it comes to interiors, males usually prefer neutral, earth-toned elements, such as sand and stone, Sanders says. Meanwhile, Blanda-Wengrod recalls a female client who looked at 75 paint samples before making a selection, something that has never happened with a male client.

Is there any biological basis for gender color preferences? Perhaps. Research finds that men identify fewer colors than women and are 16 percent more likely to be color-blind. Women not only see, but respond favorably, to a wider range of colors. One University of Texas study found that white, gray and beige offices were depressing to women, while men felt similar negative feelings in orange and purple rooms.

Regardless of their differences, says Blanda-Wengrod, men and women share the same goals for color. With busy lives, both want "comfort and relaxation" - whatever color it comes in.

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**Your Company, Our Division**

The Color and Appearance Division (CAD) is committed to the publishing of at least three newsletters a year (four, if there is sufficient material to justify the extra issue). To that end, we would like you to think about the financial side of sponsorship of the newsletter. For the small donation of $300 per year, we offer a business card sized (2 x 3.5 inches) mention in our newsletter, which goes out to the nearly 1,500 members of the CAD as well as other SPE division members. These are people active in every aspect of plastic coloring and additive technology. Larger sized spots are available at a commensurate increase in rate.

This year we are also initiating "Hot Links" on our SPE/CAD web page, located at http://www.specad.org for a fee of $300.00 per year. These Hot Links would allow visitors to our webpage to be one click away from your site!

In addition to this new service, we are also offering a discount for those who might wish to help sponsor both CAD news vehicles. The cost of a combined Hot Link/Newsletter sponsorship is $500.00 per year.

If you are interested in helping to sponsor either the SPE/CAD Newsletter or the CAD Website, or both, please contact:

**SHARYL REID, A. SCHULMAN**

Phone: 864-968-2426    Fax: 864-968-9515
Email: Sharyl_Reid@us.aschulman.com.
Sight (in particular, color vision) is a sense we use to judge things. In industrial settings, we use vision to make color judgments. Is it good color? Is it bad color? If it's bad, which direction is it off? How can it be fixed? Color measurement is at its heart an attempt to express numerically that which is seen by the human eye. It's a relatively new science, based on developments in computers, spectrophotometers, and color difference equations. Color measurement is used to make the go-no go decisions above. It's also useful to measure changes in physical appearance due to some sort of degradation (such as UV exposure, weathering, chemical exposure, and so on).

Color Difference Equations

"Many color problems resolve themselves into questions, not of the absolute constants of a color, but of the difference between two colors. This may involve the differences between a sample and the standard which it is supposed to match, or it may be the difference between the original color of a sample and that same sample after some treatment, such as weathering, or aging. Obviously, the treatment of these problems becomes much simpler if we have a numerical method of expressing the magnitude of these color differences. Also, it is very helpful if color differences which seem visually to be of about the same magnitude have approximately the same numerical value, regardless of the nature of the color differences." (Francis Scofield, 1943)

This is an apt and well-written description of color differences and the value of measuring them. Color measurement came into serious use in the 1940s in industrial countries, typically due to the increased use of colored paints and powder coatings. In industrial and artistic settings, there are a number of scales that are used to measure color difference. Each of them measures color differently from the others, and all vary in some degree in their relationship to visual assessment. There are many methods and strategies that these scales employ, but in the final analysis, they can be reduced to four basic types.

Munsell Color Scale

The first is based on the work of Albert Munsell, and is generally known as the Munsell System Color Difference Scale. This scale is based on the coordinates of the Munsell Color System, a system created to meet the needs of the artist Munsell to both identify colors and to state how they relate to each other coloristically. Munsell based his work on the notion that color could be viewed as a three-dimensional abstract, and that the three dimensions of color are hue, chroma, and value (in other words color, saturation, and lightness/darkness). He arranged his color space so that the visual differences between the various side-by-side chips appeared to be the same. Here it should be noted that this arrangement demonstrated clearly that color space as perceived by humans is not uniform, an issue which will cause a great deal of trouble as this and the other color measurement systems are created and employed. The Munsell Color System was the basis of several early attempts to quantify color industrially. Equations were worked out that allowed for the calculation of color difference numbers, primarily for textile applications at first. The very first was developed by Dorothy Nickerson and was called the Nickerson Index of Fading. It was an empirical attempt to judge fading in fabrics and textiles. It didn't take long for work to be done to measure the distance from a standard to a trial object and thus provide a color difference number. Another version of color difference determinations was a visual scale based on Munsell Gray Scale. ISO, the international standards organization, adapted a version of this in the late 1940s. AATCC and ASTM have also promoted versions of the Gray Scale method.

Adams-Nickerson Scales

The second basic type of scale was developed by E.Q. Adams in conjunction with Nickerson. Adams was developing his theory of opponent color vision, and Ms. Nickerson worked with Adams to apply this theory to the Munsell Value scale. This was modified to create color difference numbers that related more closely to the Nickerson Index of Fading. This color equation, now generally known as ANLAB40, describes total color differences in terms of differences in light vs. dark, red vs. green, and yellow vs. blue (or L, a, and b values). In 1952, this equation was used in conjunction with a filter colorimeter, and represents one of the first viable combinations of color measurement and color difference equations. Gunter Wyszecki's CIE committee used this work as the basis of the early 1970s development of the CIE L*a*b* formula.

continued on page 11
Judd-Hunter Scales
Dr. Dean Judd was the primary developer of the third scale. His notion was that L, a, and b values were not always enough to describe color differences. He became a proponent of the notion of a total color difference number, commonly known as DE. Dr. Judd, who worked for the National Bureau of Standards (NBS), defined DE as equal to DL^2 + DC^2 where L is equal to lightness and C is equal to chromaticity or saturation. He also defined DE, or total color difference, to be such that a DE of less than one unit would be commercially acceptable, while a DE of greater than one unit would be unacceptable in a commercial transaction. Dr. Judd applied his formulation to the x,y chromaticity diagram generated from the 1931 CIE 2° Standard Observer work. Richard Hunter further developed and modified this DE for the NBS to create a widely used version popular among color technicians of the time. This work that Hunter did (while working for Dr. Judd at the NBS) was actually based on reality. A series of kitchen and bathroom tiles were examined and the color difference formula was adjusted as a result, giving the formula a foundation rooted in actual visual observations.

In the late 1950s, Richard Hunter developed a color scale for use in conjunction with a tristimulus colorimeter. This was the Hunter L, a, b color scale which became widely used in machine colorimetry. It was useful for several reasons - it was visually relatively uniform, it worked in terms of the opponent color theory (light vs. dark, red vs. green, yellow vs. blue), and it was able to be used for the output of an early colorimeter. In other words, it worked!

MacAdam Systems
The fourth type of color measurement scale was based on David MacAdam’s work in the 1940s to determine the limits of acceptable color differences. His work determined that color tolerances graphed on an x,y chromaticity diagram showed the shape of ellipses. Although these ellipses varied in size throughout the chromaticity diagram, they consistently retained their basic elliptical shape. MacAdam worked with his assistant W.R.J. Brown to add lightness data to the existing hue and chromaticity information. Friele, MacAdam, and Chickering worked to create the FMC scale for color difference measurement, which later evolved into the FMC2 color equations. These have been widely used and are still used today, and remain based on the MacAdam chromaticity differences.

Two Special Cases
In 1976, the International Commission on Illumination (CIE) defined total color difference, or DE, in terms of L,a,b values in this manner: DE = [(DL^2)+(Da^2)+(Db^2)]^½. This formula has gained general acceptance at least in part as it works fairly well, and also was the best color equation for general determination of plastic color differences at the time that personal computers came into general use. Many existing color technicians, color technologists, and lab managers "cut their teeth" on the CIELab equation, and have become familiar and comfortable with its strengths and weaknesses. It is still widely used today for practical color difference determination. This formula weighs differences in lightness as having the same importance as differences in hue, a proposition that had been disproven by the earlier MacAdam and Brown work with color tolerances.

Taking CIELab issues into consideration, the Color Measurement Committee of the Society of Dyers and Colorists decided to modify the CIE formula to allow for different weights for lightness, chroma, and hue. Their color difference formulation, CMC, also allowed for different visual perceptions of color differences in different areas of color space. (For example, humans view color differences in a saturated green more tolerantly than differences in a saturated yellow or a white.) Two basic versions of the CMC equation were developed - CMC (1:1) for just barely perceivable color differences, and CMC 2:1 for commercially acceptable color differences. CMC tends to correlate better with visual assessments of color differences than does CIELab, particularly for samples and standards less than 8 or so DE units different. CMC is requested for some US automotive color specifications, and has made significant inroads into other areas of color measurement as well.

We have seen how color measurement systems have evolved over time. Various groups such as the CIE, the Color Measurement Committee of the Society of Dyers and Colorists, and others continue to work to create better equations for color differences. The somewhat elusive goal is to create a color space that works well in many industrial and scientific situations, and agrees with visual assessments made by competent color evaluators. The hope is that they will succeed.

References
You can submarine your career and work relationships by the actions you take and the behaviors you exhibit at work. No matter your education, your experience, or your title, if you can’t play well with others, you will never accomplish your work mission.

Effective work relationships form the cornerstone for success and satisfaction with your job and your career. How important are effective work relationships? Effective work relationships form the basis for promotion, pay increases, goal accomplishment, and job satisfaction.

These are the top seven ways you can play well with others at work. They form the basis for effective work relationships. These are the actions you want to take to create a positive, empowering, motivational work environment for people.

- Bring suggested solutions with the problems to the meeting table. Some employees spend an inordinate amount of time identifying problems. Honestly? That’s the easy part. Thoughtful solutions are the challenge that will earn respect and admiration from coworkers and bosses.
- Don’t ever play the blame game. You alienate coworkers, supervisors, and reporting staff. Yes, you may need to identify who was involved in a problem. You may even ask the Deming question: what about the work system caused the employee to fail? But, not my fault and publicly identifying and blaming others for failures will earn enemies. These enemies will, in turn, help you to fail. You do need allies at work.
- Your verbal and nonverbal communication matters. If you talk down to another employee, use sarcasm, or sound nasty, the other employee hears you. We are all radar machines that constantly scope out our environment.
- In one organization a high level manager said to me, “I know you don’t think I should scream at my employees. But, sometimes, they make me so mad. When is it appropriate for me to scream at the employees?” Answer: Never, of course, if respect for people is a hallmark of your organization.
- Never blind side a coworker, boss, or reporting staff person. If the first time a coworker hears about a problem is in a staff meeting or from an email sent to his supervisor, you have blind sided the coworker. Always discuss problems, first, with the people directly involved who "own" the work system. Also called lynching or ambush your coworkers, you will never build effective work alliances unless your coworkers trust you. And, without alliances, you never accomplish the most important goals.
- Keep your commitments. In an organization, work is interconnected. If you fail to meet deadlines and commitments, you affect the work of other employees. Always keep commitments, and if you can’t, make sure all affected employees know what happened. Provide a new due date and make every possible effort to honor the new deadline.
- Share credit for accomplishments, ideas, and contributions. How often do you accomplish a goal or complete a project with no help from others? If you are a manager, how many of the great ideas you promote were contributed by staff members? Take the time, and expend the energy, to thank, reward, recognize and specify contributions of the people who help you succeed. This is a no-fail approach to building effective work relationships.
- Help other employees find their greatness. Every employee in your organization has talents, skills, and experience. If you can help fellow employees harness their best abilities, you benefit the organization immeasurably. The growth of individual employees benefits the whole. Compliment, recognize, praise, and notice contributions. You don’t have to be a manager to help create a positive, motivating environment for employees. In this environment, employees do find and contribute their greatness.

If you regularly carry out these seven actions, you will play well with others and develop effective work relationships. Coworkers will value you as a colleague. Bosses will believe you play on the right team. You’ll accomplish your work goals, and you may even experience fun, recognition, and personal motivation. Work can’t get any better than that.

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OPENING/WELCOME (DAVE JOHNSON)
The meeting opened with a welcome from Dave Johnson (Chair). Dave then welcomed our guests Lesley Kyle & Marie Russo from ISPE and Scott Aumann from EMD Chemicals.

SECRETARY’S REPORT (TIM REILLY)
There was a motion to accept the minutes from the August 6, 2006 meeting. The motion was seconded. Minutes of the last meeting of August 2006 were approved.

TREASURER’S REPORT (BRUCE MULHOLLAND)
Bruce stated that the scholarship monies have been distributed. A motion was made to accept treasurer’s report as written. Motion accepted.

COUNCILOR’S REPORT (AUSTIN REID)
Austin Reid stated that the Councilor’s meeting is Friday, September 29th in Pittsburgh. He stated that the following changes being made to ANTEC would be discussed at the meeting:

1) It will be a 1-year change.
2) The ANTEC Trade Show in Cincinnati will be done as a Plastics Encounter which is an industrial trade show.
3) The show will have an extra ½ day of technical programs.
4) The show will have a more diverse group of attendees.
5) This is being viewed as a very positive change.

ANTEC TECHNICAL PROGRAM COMMITTEE (BRUCE MULHOLLAND)
ANTEC 2007 (Cincinnati, OH) - Kathryn Brannon and Scott Heitzman
Kathryn reported that they have 9 papers committed and 5 undecided. The abstract submission deadline is October 16th and paper deadline is December 4th. Paper reviews are to be completed by December 29th and the revision deadline date is January 10, 2007. There will be a new ANTEC schedule in 2007 in which the SPE Celebration Banquet will take place on Sunday night. And the Opening Welcome Reception will take place on Monday night.

ANTEC 2008 (Milwaukee, WI) - Ann Smeltzer & Marty Paisner
No action to report.

ANTEC 2009 (San Antonio, TX) - Roger Reinicker & Tracy Phillips
No action to report.
ANTEC 2010 (Orlando, FL)
No action to report.
ANTEC 2011 (Boston, MA)
No action to report.

RETEC TECHNICAL PROGRAM COMMITTEE - SANDRA DAVIS
RETEC 2006 (Cincinnati, OH) - Scott Heitzman/Bruce Mulholland
Sandy thanked Scott for doing a great job as the Chair. Scott stated the initial attendance count is 482. He said very large corporate groups brought a large representation from their sales and lab groups. He said that the feedback on the hotel was very positive. Scott thanked Bob Charvat for his very successful training program and he thinks that the "Back to Basics" theme brought great value to all the attendees. Scott very graciously thanked his committee members for making the RETEC a great success.

RETEC 2007 (San Antonio, TX) - Tim Reilly, Jim Figianiak Oct. 1-2, 2007
Tim Reilly said they have a new contact at the host hotel. Tim made the hotel contact aware that he will be stepping off as the conference chair due to a new work assignment/position. Sharon Ehr is working on the logo for him. Jim Figianiak will continue as the general chair and Austin Reid has agreed to be his co-chair. The TPC committee has already received a few paper commitments.

RETEC 2008 (Detroit, Hyatt Dearborn) w/ Detroit CCC Sept 21-23, (Bruce Mulholland)
Bruce has a contract signed with the Dearborn Hyatt. The dates are sealed with ISPE. Bruce negotiated that the Clarient breakfasts and hospitality food money will be counted toward our overall food budget. Bruce will hold his 1st committee meeting at our winter BOD meeting.

RETEC 2009 Savannah, GA - Aram Terzian
Aram has approval on the hotel package and dates from ISPE. He will hold a 2nd committee meeting at our BOD Meeting. Howard Kennedy asked if the dates could be changed as the Canadian Thanksgiving falls during those dates. Sandy Davis will discuss this with Aram.

EDUCATION COMMITTEE (BOB CHARVAT & JAMIE PRZYBYLSKI)
Mr. Charvat stated that he has several positions open in the Clearinghouse and welcomes any recruits. Jamie stated that Terra's Distance Learning Program is thriving and he thanked Scott Heitzman and the board members for allowing the Terra Tech students to attend and volunteer to help at this RETEC. Bob said that the Color Technology Book has languished some due to format inconsistency.

RETEC PAPER ARCHIVE (TRACY PHILLIPS)
Tracy reported the prices she researched. She will have further discussions with ISPE prior to our next meeting.

CAD TAG LINE CONTEST (TRACY PHILLIPS)
Tracy said that the committee will compile the submissions received from RETEC and narrow down to 5. She will then have ISPE review to make sure they have not already been used elsewhere. We will then vote on the final 5 at the Winter CAD BOD meeting. Tracy will then contact the winner and have it published in the next newsletter and they will be recognized at the following RETEC Awards Luncheon.

continued on page 15
NEWSLETTER COMMITTEE (BARB PARKER/SHARYL REID)
Barb stated that she could use more technical articles for the upcoming issues. Barb thanked Scott Heitzman for all of his recent article submissions. Sharyl reported that she would soon be sending out 2006 CAD News Invoices.

CAD WEB-SITE (JOE CAMERON)
Joe Cameron stated that the website is ready to go live. Tracy Phillips has defined goals to strive toward as to how it should look as we progress forward. Tracy said that Reggie stated we could keep the ColorPro links. The committee will have a "Member's Only" section set up.

ENDOWMENT COMMITTEE (JOHNNY SUTHERS)
Johnny stated that scholarship recipients went well. They have named scholarships after Jack Graff, Bob Charvat and Gary Beebe. The endowment committee will have a telephone conference on how to go about repeat scholarships. Johnny hopes to receive more applications next year.

AWARDS COMMITTEE (STEVE GOLDSTEIN)
Steve stated that he would better explain each award next year as it is given at RETEC so that the audience will be more familiar with the background and requirements that goes along with each award. Bruce Mulholland received the Honored Service Award. Austin Reid received the Outstanding Achievement Award. It was decided 2 meetings ago that the next Honored Service Award Nominee will be Terry Golding sponsored by Austin Reid and Bruce Mulholland.

PUBLIC INTEREST COMMITTEE (GARY CONRAD)
Gary said that he would have an electronic version of the results out to us in about 2 weeks. He said there were 94 responses and the comment listed most was how awesome the classroom setting in the meeting room was.

COLOR ADVISORY GROUP (BRIAN WEST)
Brian stated that the paper on the USI was good and that an invitation was extended to the TAPPI organization.

INTERNATIONAL COMMITTEE (BRIAN WEST)
Brian stated that he put the European A&C Group’s brochures at the CAD tabletop and on tables in and outside the paper meeting room. He will also put the information on the European A&C Conference into the next newsletter issue.

MEMBERSHIP COMMITTEE (ROGER REINICKER)
Roger has compiled a month's worth of data and Bruce will email Roger the 2006 RETEC registration information to incorporate it into his data.

DIVISION/SECTION TECHNICAL RESOURCE COMMITTEE (STEVE GOLDSTEIN)
Steve said that he is ready to launch the 1st article. Steve will send it to all the CAD BOD members along with the disclaimer for review prior to it going out.

PLASTIC MUSEUM COMMITTEE (BOB CHARVAT)
Bob has asked for feedback from the board members with little reply so Bob said he would put a display together and then have us scrutinize it for improvements.

OLD BUSINESS (ALL)
Reviewed and updated existing action item list.

NEW BUSINESS (ALL)
In light of Tim Reilly stepping down from his CAD BOD position due to a new work assignment, Jim Figaniak, being next in line vote wise, will take Tim Reilly’s place on the board.

The Chairman used his Discretionary Fund to match the amount of monies that the Fun Walk generated to be donated to the local chapter of Habitat for Humanity in Cincinnati.

Austin Reid made a motion to make the CAD Newsletter Business Manager a chair position. The vote was taken and accepted to make this the Sponsorship Finance Chair position moving forward.

Due to the fact that Tim Reilly has resigned his position from the CAD BOD due to his new work assignment we took nominations to fill his position as Secretary on the Executive Board. Howard Kennedy and Scott Heitzman were nominated. The votes were taken and counted by the Chair-Elect. Howard Kennedy was voted in as Secretary to the CAD BOD.

There was a discussion about taking a look at alternate time and day schedules for future RETEC’s as it is very difficult for some people to start that early on a Monday morning. The board members are to send all ideas to Sandy Davis to investigate.

A motion was made that the by-laws be amended to allow past chairman to attend the executive board as ex-officio attendees. A vote was taken and the motion was denied.

The winter CAD Board meeting will be held January 8th-9th, 2007. The location will be announced by Dave Johnson at a later date.

Lesley Kyle announced that a micro site for students will be rolled out from ISPE in the next few weeks. This site can be used to announce awards, competitions and scholarships. The web address is www:4spe.org/zone.
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2009 - May 3-7, San Antonio, Texas

2010 - May 16-20, Orlando, Florida

2011 - May 1-5, Boston, Massachusetts

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**FUTURE RETEC® MEETINGS**

2008 RETEC Detroit  
Venue: Hyatt Dearborn  
Dates: September 21-23, 2008  
Chair: Bruce Mulholland

2009 RETEC Savannah, GA  
Venue: Hyatt Regency Savannah  
Dates: October 18th - 20th - 2009  
Chair: Aram Terzian

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**TERRA COMMUNITY COLLEGE:**

**INTERNET COURSES FOR PLASTICS PROCESSORS SPRING 2008**

<table>
<thead>
<tr>
<th>Courses offered in Spring Semester (Begins January 7, 2008)</th>
<th>Fees: $365 Ohio students</th>
<th>$600 out of state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section VL PET 1100 Introduction to Plastics (3 Credits)</td>
<td>Books: approximately $200</td>
<td></td>
</tr>
<tr>
<td>Section VL PET 1240 Introduction to Color (3 Credits)</td>
<td>Books: approximately $200</td>
<td></td>
</tr>
<tr>
<td>Section VL PET 2320 Colorants for Plastics (3 Credits)</td>
<td>Books: approximately $200</td>
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</tbody>
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The two courses above, along with a third to be offered in January, can be taken to complete a certificate program designed to give plastics processors valuable color knowledge. Processors are experts on producing the parts that they make, however they often do not have the knowledge necessary to prevent potentially expensive color problems from occurring. These courses are designed to provide this valuable color knowledge to QC technicians, operators, production engineers, or anyone else that needs to work with the coloring of plastic parts to reduce color problems and help lower production costs.

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India has always been exalted and remembered fondly as the country of colors. To an outsider, its colorful culture, streets and stories seem like a page out of ancient folk tales. But color in essence has been a large part of the Indian consciousness.

From the deep orange marigold flowers that bejewel almost every celebration to the deep hues of red that bedeck the bride on her most important day, color in India has over time become synonymous with religion, an expression of faith and beliefs. In a country where a deep understanding of the prevalent diversity is perhaps the only common thread that ties in its people, India is a magical experience ought not to be missed.

Just in as many other cultures across the world, there are some typical classifications of color to be found in India. Black in India has connotations of lack of desirability, evil, negativity and inertia. It represents anger and darkness and is associated with the absence of energy, barrenness and death. Black is used as a representation of evil and is often used to ward off evil. This can be found in an age old custom amongst Indians where an infant or for that matter anyone looking really spectacular is often traditionally blessed with a little black dot on the chin or under the ear to ward off the evil eye. And while white stands for everything desirable in the west, in India it takes on a more somber connotation. White is the absence of color and is the only color widows are allowed to wear. It is the acceptable color at funerals and ceremonies that mark death in the family. It reflects the basic quality of the color itself in principle- White as a color repels all light and colors and therefore when a widow wears white, she disconnects her self from the pleasures and luxuries of active and normal participation in society and life around her. White is also widely accepted as the color of peace and purity and is diametrically opposite to red, the color of violence and disruption in the southern half of India.

Red is dynamic and constantly breathing fire in the eyes of the beholder, it incites fear and is the color associated with one of the most revered goddesses in Hindu mythology- Durga. Her fiery image is enhanced by her red tongue and almost red eyes. The color also stands for purity and is the preferred color for a bride's garment. Red has a deep meaning in the Indian psyche. It commemorates the union between two people and is visible right from the wedding, where the bride is decked in brilliant hues of red to the red tikka (spot on forehead) that she adorns after the wedding as a sign of her commitment. It is perhaps easy to see why red also symbolizes fertility and prosperity.

Turmeric, for instance, while being used for cooking in both north and the south, is also used in ceremonies offering prayers and marriages. Yellow symbolizes sanctity and is an essential herbal ingredient applied on the body and face by women in the sub-continent. In a country steeped in religious beliefs, the origin of most colors lies in the powers and mythical lives of its gods. The color blue, for example, is associated with Lord Krishna, perhaps one of the most favored gods in India. And as is obvious for any agricultural economy green would symbolize a new beginning, harvest and happiness it is also the revered color of Islam, a large religious presence in India. Green symbolizes nature and therefore is a manifestation of God himself.

The colors of India have mesmerized rulers, outsiders and visitors perhaps more so because of the stories and legends that bind its people, its culture and its beliefs. The 'rani' pink of mystical Rajasthan, the pastel hues of southern India, the joyous bright hues of the northern frontier to the balmy bright colors of the east, India offers a kaleidoscopic insight into an almost perfect blend of history and modernism. Perhaps only a trip down its many roads will lead you to an understanding of its pulse. Maybe you'll take the road untaken and bring home a whole new hue to your life.

Excerpted from Color Chips Spring 2007
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