



For as long as I can remember fall has been my favorite time of year. The colors and scents of fall, how everything changes is truly beautiful to see. I love watching as nature creates its own rainbow of colors. It really makes me appreciate how blessed I am to have the ability to see all the worlds color, and to be in the coloring of plastics industry. For me it has been 26 years in this industry, that may sound like a lot but when you talk with the veterans that have 40+ years, it is only a drop in the bucket. Many of these long-term veterans sit beside me on the board of CAD. They work tirelessly on educating those involved in the coloring of plastics.

RETEC® 2017 in Wisconsin was very successful with 455 attendees and a record 47 table exhibitors. Our event continues to grow and the Color & Appearance Board members would like to hear from you. Please feel free to send suggestions on ways we can make the program even better. One way we strive to improve is working to expand our social media where more information can be communicated quickly, board member Mercedes Landazuri has volunteered to head this undertaking and she is already doing a wonderful job. Follow CAD with Mercedes on Facebook: @SPECAD, Twitter: @CADRETEC, LinkedIn: SPE Color & Appearance Division.

Our group continues to grow and evolve, and I would like to thank James Rediske for his dedicated efforts over the years. Jim has served on many committee as well as being a valued speaker at past ANTEC® and CAD RETEC® Conferences. Jim decided to retire at the end of this year. We wish Jim all the best in his retirement. Brian West was selected by the Board of Directors to fill Jim's position as Chair-Elect of the Division.

On a related note, we will be holding Board of Director and SPE CAD Board Member elections for the 2018-2021 term during February-March 2018. Board members participate in four meetings per year with two meetings held at

ANTEC® and CAD RETEC®. Councilors take part in 4 meetings per year with 2 meetings at ANTEC®. Anyone interested in running for these positions can contact a CAD board member for details. Deadline for candidate nomination and biography is January 15, 2018. All candidates must be a current SPE member and have CAD as their primary division.

Our next CAD meeting is scheduled for Thursday January 11th in Atlanta GA. Attending a board meeting is a great opportunity to learn more about how the board works. SPE CAD members who would like to attend please contact any board member.

ANTEC® has long been known as the largest technical conference on plastics with cutting edge academic and industry research being presented. ANTEC® 2018 will be in Orlando Florida on May 7th thru 10th at the Orange County Convention Center, Co-located with NPE 2018. Doreen Becker and Ann Smeltzer are putting together a great program. A panel discussion has been added and the topic is What's New in Colorants. If you are think you can add to this discussion or if you have a technical paper you would like to present, please contact a board member to get signed up.

Wishing you a Colorful Fall.

Cheryl Treat
Chairman

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CAD RETEC® 2017 in Milwaukee was a great success. Attendance was 455! I would like to thank our sponsors once again, with specific thanks to our Platinum Sponsors Aakash Chemicals, BASF, Lansco Colors and The Shepherd Color Company. Registration fees are kept low in part by the generous donations of our sponsors. Everyone I spoke to really enjoyed Milwaukee and we did have great weather for mid-September. Technical sessions were well attended and we received a lot of positive feedback on the LED super session on Monday, and the quality of the presentations overall. Thanks to Michael Willis, Ed Ford, and Jack Ladson for all of their work on the technical program. Tabletops were in multiple rooms this year to avoid having to use the convention center across the street. Traffic appeared to flow well between the rooms. Thanks to Brian West for coordinating the exhibit space. I would like to thank the rest of the CAD RETEC® 2017 Committee for all of their hard work to make this conference a success. For those of you who either renewed SPE membership, or received a SPE membership as part of the conference registration, you should have received a confirmation e-mail from SPE headquarters once the memberships were processed. If you did not receive notification, please let me know. See you all in Charleston in 2018.

Bruce Mulholland, CAD RETEC® 2017 General Chair

2017 End of Conference Prize Giveaway

Grand Prize was Bose® Noise Cancelling Wireless Headphones.

Must have filled out the conference survey to enter contest and be present to win



2017 Fall Newsletter Editor's Note



Where did 2017 go? Another year has flown by and so many things to look back on and smile about with our Division and its accomplishments. The Color and Appearance Division received both the 2017 SPE Communications Excellence Leader Award and the 2017 SPE Pinnacle Gold Award which continues to show that this division remains active and informed. The Division supported a successful ANTEC® technical session in Anaheim back in May and most recently the successful 2017 RETEC® in Milwaukee.

Looking back at the 2017 RETEC® in Milwaukee, all I can think was what a great city and what a great event. Topping the conference agenda was the LED Illumination Super Session that showcased the number of topics around LED lighting sources. Hopefully, the sessions enhanced the understanding of LED's and their continued uses and potential issues. The conference was full of

great presentations around many day to day topics as well as

As 2017 comes to a close, we would like to send out a huge thank you to all the sponsors to our division. Without their continued support, we could not do all the things we do to make the Color and Appearance Division one of the best divisions of SPE. From supporting RETEC® to supporting this Newsletter, the sponsors really step up when it comes to our division.

Their support allows us to keep fees low for our RETEC® conference, publish this newsletter and award over \$100,000 in scholarships over the past three years, just to name some.

Mark Tyler

Newsletter Editor

Now Available- Conference Proceedings

CAD RETEC® 2017 Proceedings available for download. [Click here](#)

Enter the email address used to register for 2017 RETEC® for conference proceedings login and same email address for password.



Registration fees for attendees are kept low in part by the generous donations of corporate and individual sponsors. We'd like to say a special thanks to these generous sponsors and recognize their support of the conference.

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Call For Papers



Color and
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Division

SPE CAD RETEC® 2018

Embassy Suites
Charleston, South Carolina



Coloring the World of Plastics



September 23–25, 2018

Events will be located both at the hotel and the convention center

Conference Chair: Brenda Mullins
Brenda.mullins@basf.com (313) 920-7113

**DEADLINE FOR ABSTRACTS:
FEBRUARY 2018**

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CAD NEWS®



Color and
Appearance
Division

**Call for Candidates
Color & Appearance Division
Board of Directors
WE NEED YOUR HELP –
CONTINUE THE EXCELLENCE!**



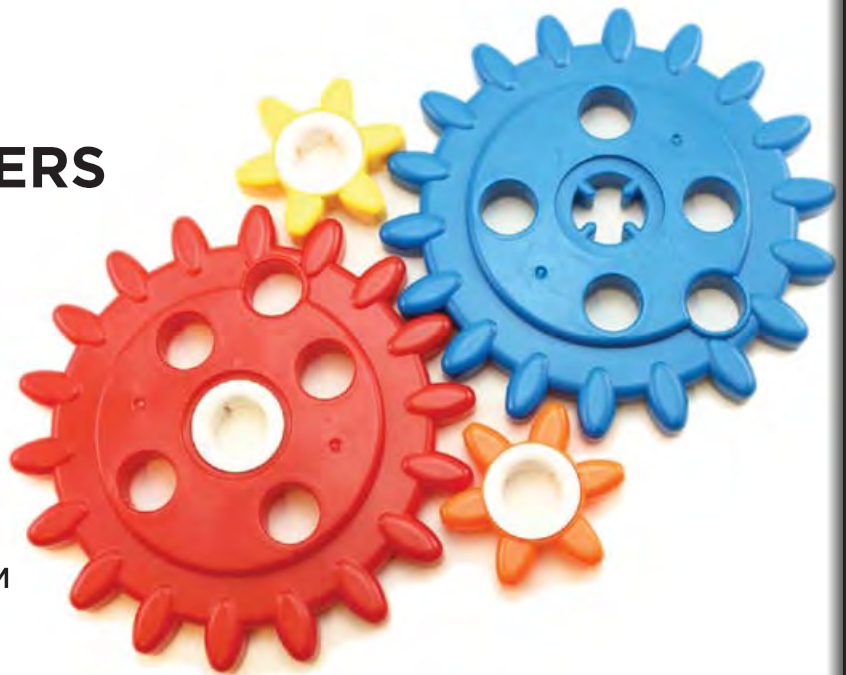
Interested candidates for the 2018 Board of Directors should contact Brian West, Jeff Drusda, any Board Member.
(Contact information located on last page of this Newsletter)

- ◆ We are soliciting candidates through the end of 2017
- ◆ Biographies due 2nd week of January, 2018
- ◆ Elections start in February, 2018 and run throughout the month
- ◆ If elected, term is 3 years (serve until 2021)
- ◆ There are 4 Board meetings per year to attend: ANTEC®, CAD RETEC®, Winter, and Summer meetings

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Review of Twin Screw Extrusion Parameters That Impact TiO₂ Dispersion

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Abstract

Twin screw extrusion processes have long been a staple of the plastics manufacturing industry. Masterbatch compounding processes are the primary means of incorporating titanium dioxide into plastic melts, particularly so for polyolefins. The majority of twin screw compounding processes are optimized for low solids content and the very specialized field of high solids compounding remains largely unexplored in the masterbatch compounding market. One mystery of high solids compounding, especially with materials such as TiO₂ pigment, is the role of process parameters with respect to pigment dispersion. The paper demonstrates how temperature and the ratio of feed rate/ RPM (Q/N), are pre-determinants for the dispersion quality using a given screw design. The paper utilizes computer simulation to highlight the impact of screw design and how the screw design impacts the fill factor, residence time distribution and viscosity. The impacts are then linked with a sieving dispersion test to characterize the level of agglomerates in a 70% TiO₂ formulation in LDPE.

Introduction:

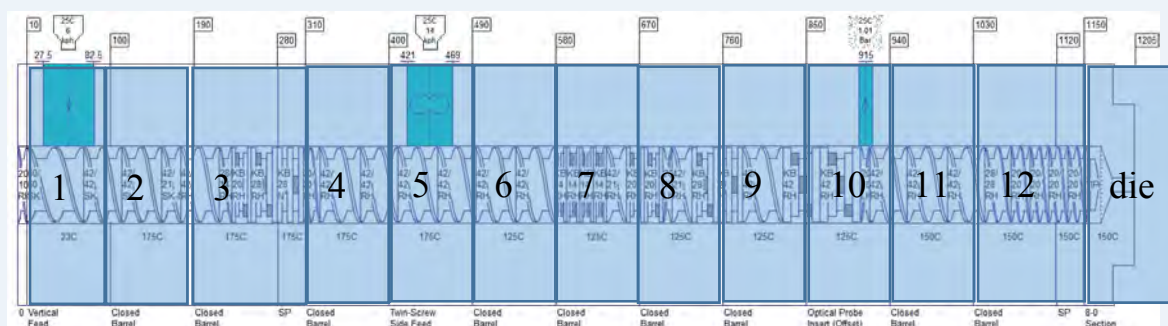
The extrusion process for plastics with high solids content has been gaining interest as a specialized technology to understand the interplay of process parameters with dispersion quality. For example, recent articles have utilized percolation theory as a means to describe the role of a plastic containing high solids as a Bingham fluid and how this description of viscosity is relevant to dispersion performance 1,2. Additionally, studies matching dispersion performance with residence time distribution and shear distribution with choice of twin screw processing elements has been reviewed 3. The interplay of viscosity, screw speed, element selection, screw speed and throughput with temperature have been demonstrated with shear distribution for various twin screw elements. The general trend for a given screw element is that as the screw speed and throughput increase, the shear is higher and dispersion is presumed to improve. Additionally, the studies have shown that increasing barrel temperature lessens the impact of higher screw speed and through-put. Modelling extruder conditions by varying the screw and through-put rates allows for calibration of extrusion parameters but lacks the ability to describe quality of dispersion. The missing link is experimentally determining the dispersion performance for given operational parameters of a given screw design.

Experimental:

This study was conducted on a 30mm co-rotating twin screw extruder that has a 36:1 L/D and is equipped with two gravimetric feeders and a strand die for pelletization. The extruder has twelve barrel sections and a two-hole die. The extruder drive is rated 9 kW at 500 rpm (maximum screw speed). Melt thermocouples were installed in barrels 4 and 7. Melt pressure transducers are located at the screw tips and at the die. TiO₂ is introduced in barrel 5 via a twin-screw side-feeder.

The extruder screw design is provided in Figure One.

Figure One: Design for 30 mm twin extruder



The % torque and other process data were recorded using the extruder's data acquisition system. The purge and equilibrium time for each sample was fifteen minutes. Data measurements were taken every twelve seconds and the measurements were averaged for the last twenty minutes of the sample run to obtain the process data for a given condition.

Dispersion quality was measured using the "Screen Pack Analysis" method described in literature ⁴. The test involves the extrusion of 700 grams of TiO₂ (ex. 1000 g of the compounded TiO₂ masterbatch for 70% wt TiO₂) through a screen pack containing six screens in the following order: 30 mesh-60 mesh-500 mesh, followed by three 60 mesh screens, using a Killion 1" (30.54 mm) single screw extruder. The polymer is burned off and after cooling, the residue on the 500 mesh screen is affixed to the screen using a clear fixative agent. The screen is analyzed in an X-ray fluorescence (XRF) spectrometer, compared against a calibration standard and a "screen pack dispersion number" (SPD) is calculated

Materials and test conditions:

A low-density polyethylene (LDPE) with a nominal melt flow index of 12g/10 min., specific gravity 0.92 g/cc and softening point of 80°C was utilized for all evaluations. The loading of TiO₂ was 70% by weight.

The processing conditions that were used for this experiment are as follows. Cooling water was used only at barrel 1 for all of the samples. The experiment included three different temperature set points for barrels 2, 3, 4, 5 and 6: 125°C, 150°C, and 175°C. Barrels 7, 8, 9 and 10 temperature set points were held constant at 125°C. Barrels 11, 12 and the die temperature set points were kept constant at 150°C. Three different throughput rates (Q) were used for each of the three barrel temperature set points. The throughput rates of 20, 22.5, and 25 kg/hr. were used for this set of experiments. Three screw speeds (N) were used at each of the three throughput rates (Q). These screw speeds were 200, 250, and 300 rpm. A total of nine samples were run at each of the three barrel temperature set points. Twenty-seven samples were run during this testing. The main distinguishing feature of the experimental design is to note the influence of temperature at different Q/N ratio's ranging from 0.07 to 0.13.

For the chosen screw design, twelve barrel sections can be used to describe the location of various elements and their functions.

Barrel section 1: Resin ONLY addition point, conveying elements, and barrel cooled with water to avoid resin sticking to the screws, barrel, and feed throat

Barrel section 2: Conveying elements and initial heating of resin

Barrel section 3: Conveying and mixing/melting with narrow and medium width right hand kneading blocks to initiate distributive mixing/melting of resin polymer

Barrel section 4: Distributive mixing/heating with medium width kneading elements and conveying of molten polymer

Barrel section 5: Addition of TiO₂ powder into molten polymer stream

Barrel section 6: Conveying of TiO₂ powder/polymer

Barrel section 7: Mixing/melting with narrow width right hand kneading blocks to initiate distributive mixing/melting of resin polymer followed by a conveying element to relax the viscosity of TiO₂/resin mixture

Barrel section 8: Mixing/melting with narrow and medium width right hand kneading blocks to initiate distributive mixing/melting of resin polymer, left hand conveying element to provide back pressure/back flow and a conveying element to relax the viscosity of TiO₂/polymer mixture

Barrel section 9: Neutral medium width kneading block, followed by a conveying element to relax viscosity of TiO₂/polymer mix, then right hand medium width kneading blocks

Barrel section 10: Wide width right hand kneading elements for additional/finishing dispersive mixing and a left hand conveying element to provide back pressure/back flow

Barrel section 11: Conveying elements to pump mixture to die

Barrel section 12: Conveying elements to provide pressure to die

The key feature of the experiment was to note the impact of the initial polymer melt temperature on the dispersion of the TiO₂ powder. The hypothesis was that dispersion would deteriorate as the temperature increased but the role of Q/N ratio was not defined. Previous studies indicated the viscosity at higher temperatures was not sufficient to cause agglomerate rupture and dispersion was therefore poor. Additionally, lower temperature did not provide sufficient polymer penetration into the agglomerate matrix for dispersion⁵. The purpose of the experiment was to determine the optimum temperature for a given Q/N ratio that provided the highest level of dispersion quality.

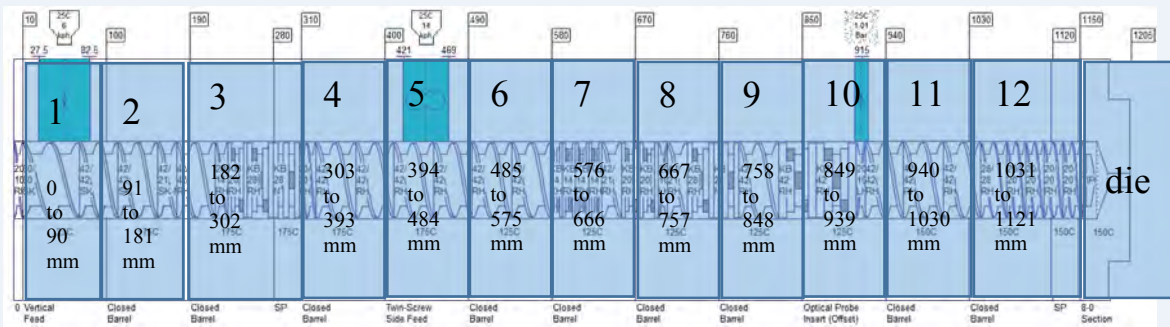
Results and Discussion:

The ratio of mass flow rate, Q, to the screw RPM, N, serves as a useful calibrator to evaluate the processing conditions for dispersion performance. Quite often dispersion is viewed as performance parameter that is dictated by raw material selection, residence time, shear distribution and fill level (volume occupied by mass flow) within a particular screw design. The most useful calibrator of the process is Q/N ratio versus Q and N individually. For high solids compounding, the most common “best practice” uses a maximum allowable Q and adjusting the RPM for operating parameters such as melt pressure and torque to maintain quality in dispersion; i.e., fastest processing rate. As such, Q/N ratio is adjusted by keeping Q constant and changing N. This practice is useful for empirical evaluation of Q/N with dispersion but lacks the ability to determine Q/N boundary conditions for a defined screw design. Extrusion modelling can offer insight to identify Q/N ratios that may be of concern for dispersion. For example, for certain Q/N values,

dispersive mixing sections could have excessive mass that exceeds the volume capacity of the barrel zone. Processing parameters such as torque and pressure may not offer the resolution to pinpoint a barrel zone as an area of trouble. Additionally, residence time may be too short in certain zones where viscosity is favorable at certain Q/N ratios. Again, operational monitoring devices would be “blind” to the differences. In this experiment, extrusion modelling of the operation was conducted to gain insight in identifying Q/N ratios of concern for dispersion performance before the temperature component was added as an important parameter for dispersion.

Computer modelling of screw design the screw design was done by charting the barrel length in mm versus volumetric flow rate (cc/sec), degree of fill (% of volume occupied by mass) residence time (seconds), effective viscosity (pascal sec). Figure Two describes position of the barrel zones in mms.

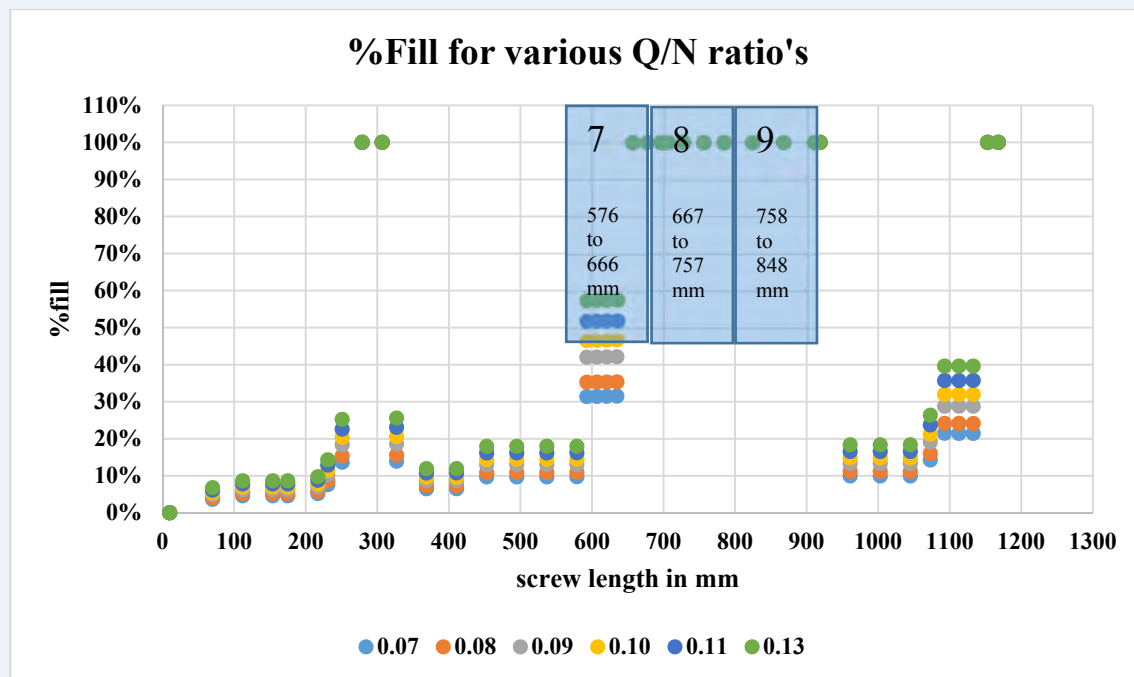
Figure two: Length definition for certain barrel zones



The focal points in the screw design are barrel zones which contain elements designed to manage the initial dispersion/distribution of the titanium dioxide powder. These barrel zones are primarily 7 and 8 (575 to 66 mm and 667 to 757 mm). Barrel zones 9 and 10 (758 to 848 mm and 849 mm to 939 mm) serve as a dispersion/distributive polish. From polymer melting perspective, barrel zone 3 is the main focus (182 to 302 mm).

The first simulation is to note the impact of Q/N ratio on %fill along the length of the screw. The %fill (% volume occupied by the TiO₂/polymer mass) is noted in Figure Three.

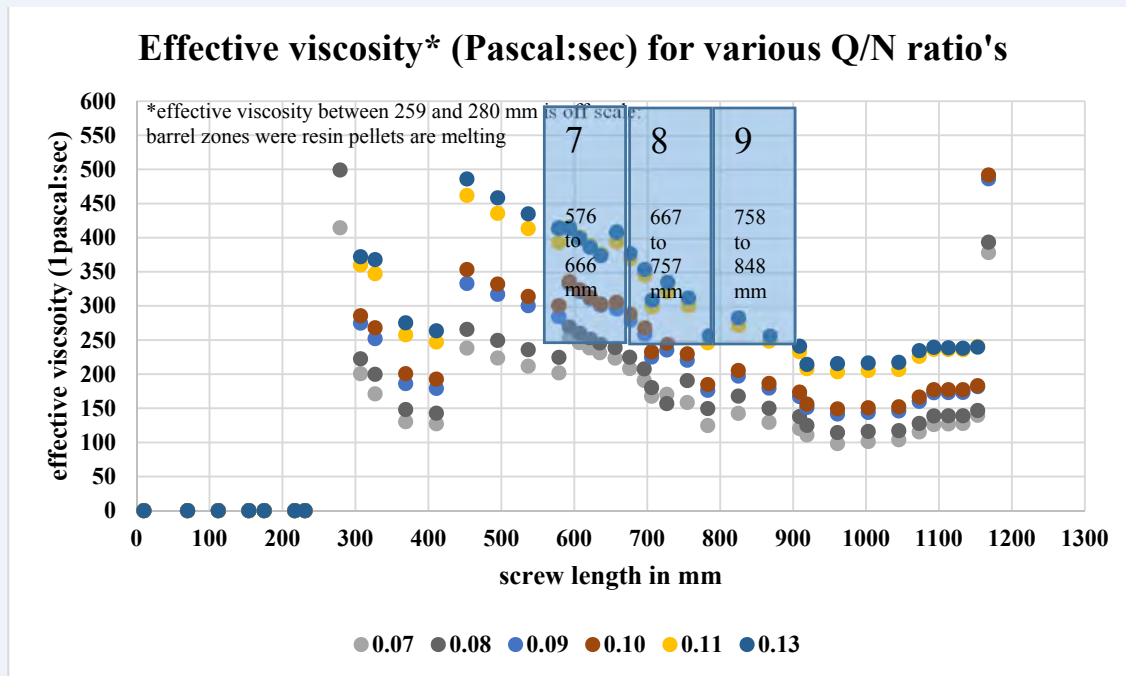
Figure Three: Computer Simulation of %Fill with various Q/N ratios at 125 deg C



The modelling highlights those zones where the screw length is completely full regardless of Q/N ratio. The resin melt section (275 to 302 mm) is always full. The mixing sections for the TiO₂ powder and resin (650 to 925 mm) are always full. The intriguing trend is that as the Q/N ratio increases, the length between 590 and 650 mm starts to get “fuller”. This section is primarily where the wet-in of polymer with dry TiO₂ occurs in the screw design. If this location loses viscosity with Q/N ratio or temperature increases, this section could impact the dispersion. However, an insufficiently high temperature would not allow for polymer penetration into the dry TiO₂ agglomerate. Hence, an optimum temperature must be identified for a Q/N ratio. The modelling program provides an “effective viscosity” term that highlights the trend of viscosity with Q/N ratio (see Figure Four); the trend implies that as more mass per rotation moves through section 7, the viscosity increases. In Figure Four, the effective viscosity values for the barrel zone 3 where the resin is melted have been removed allowing the focus to be on the barrel zones where TiO₂ and resin are mixing. The resin melting barrel section 3 dominates the effective viscosity graph if included. The viscosity in the resin melting zones is nearly four times the sections where TiO₂ and resin are being mixed.

Figure Four also highlights the impact of the “viscosity break” at the 590 to 650 mm position. The simulation demonstrates what the term “viscosity break” means; a position in the barrel length for TiO₂/polymer blend to recover viscosity. This recovery is favorable to dispersion provided the TiO₂ particle agglomerate has been sufficiently been “wetted” by resin. The hypothesis is the TiO₂ agglomerate is wetted by molten resin in regions of low viscosity (up to 570 mm), then the mixture is to recover viscosity with either cooling or lower shear to become “sticky”, or more viscous (575 to 610 mm). The “wetted” sticky agglomerates start to glue together and then are sheared into smaller agglomerates (after 610 mm) and viscosity starts to fade into the polish barrel zones.

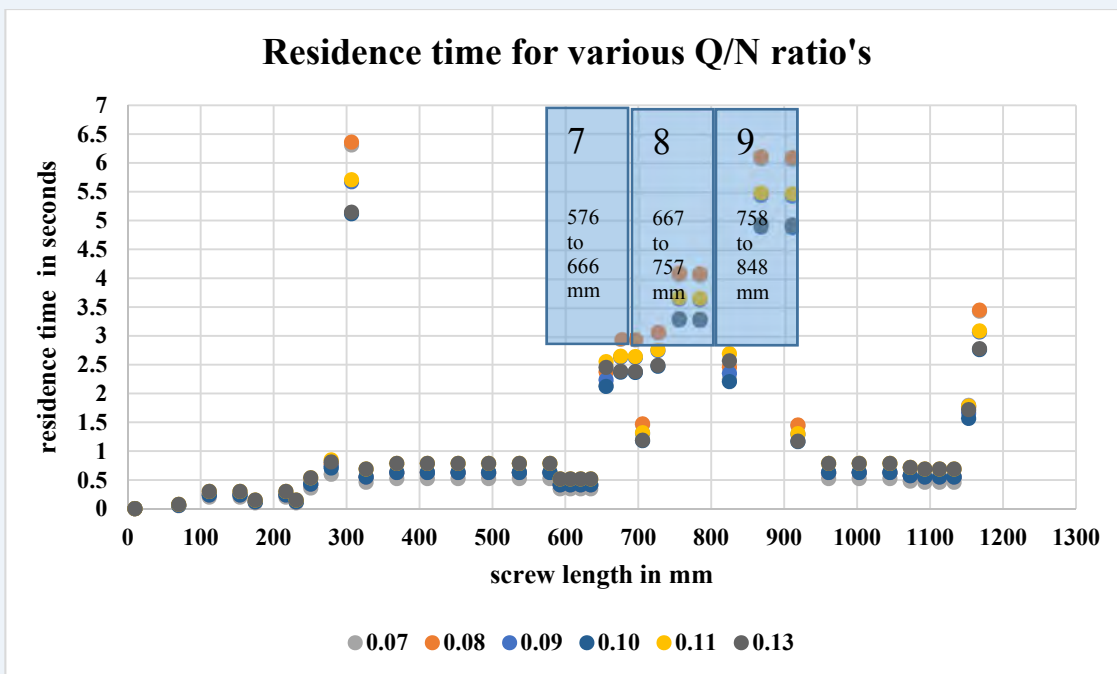
Figure Four: Computer Simulation of effective viscosity with various Q/N ratio's at 125 deg C.



So, the modelling highlighted that as the mass flow moves through the barrel zones 6 and 7, this portion of the screw length is getting full (%fill increases) and more viscous as the Q/N ratio increases. The next simulation involves residence time, “what length of time is the wetted, sticky TiO₂ agglomerate rupturing in different barrel sections?”

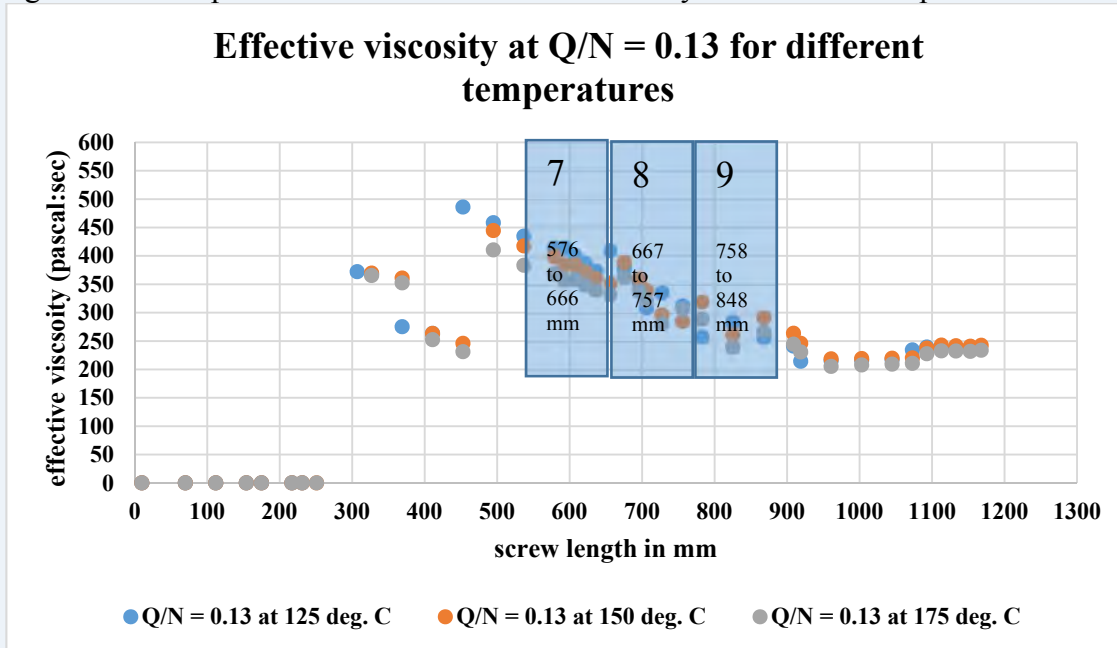
The key screw elements to impact residence time are “left hand” and “neutral” elements. These elements provide the necessary back flow to allow material to recirculate and increase residence time. In this experiment, two left hand elements are present in the screw design located in barrel zones 8 and 10 (approximately at 730 and 860 mm) and a neutral is located in barrel zone 9 (77 mm). Based on the modelling, residence time decreases with increasing Q/N, i.e., less time at a particular location. The previous review of fill and viscosity demonstrated that the wet, sticky TiO₂ agglomerate formation is favored at high Q/N ratios. However, in the screw design locations where “viscosity breaks” are incorporated, the wet, sticky agglomerates does not reside in that environment for extended periods of time. So the question remains which temperature favors wetting TiO₂ agglomerates to create stickier agglomerates that have enough time at higher Q/N ratios for dispersion?

Figure Five: Computer simulation of residence time distribution with various Q/N ratio’s at 125 deg C



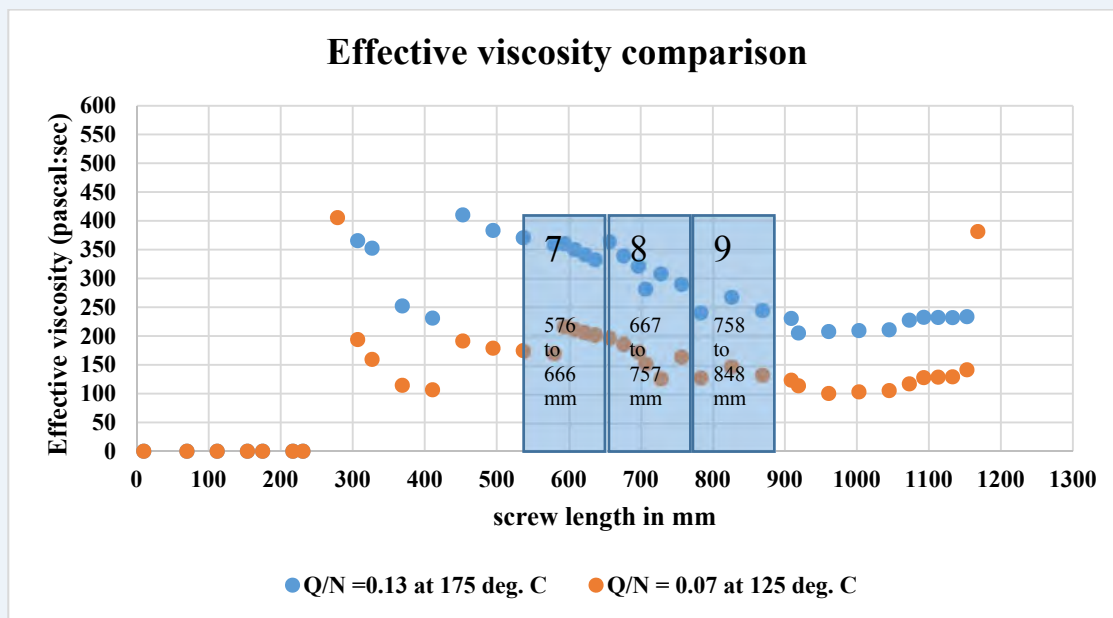
The modelling can be used to anticipate the impact of temperature at the same Q/N ratio. The modelling indicates that the higher Q/N ratio would be more favorable for effective viscosity and %fill BUT the residence time is too short. Temperature would not influence the %fill to a large degree (minor melt density changes at constant TiO₂ loadings) but it can influence effective viscosity. Figure Six showcases the influence on temperature adjustments at the highest Q/N ratio reviewed. As expected, the effective viscosity increases as the TiO₂/polymer melt is cooled.

Figure Six: Computer simulation of effective viscosity with various temperatures at constant Q/N



Modelling can also be used as an indicator as temperature and Q/N ratios are compared. For example, the comparison of lower temperature at low Q/N may have the same effective viscosity as a high temperature at high Q/N ratio. Figure Six demonstrated the magnitude of temperature required to offset a low Q/N ratio.

Figure Seven: Computer simulation of effective viscosity with various temperatures and Q/N



According to the modelling, the impact of a cooler temperature is helpful; effective viscosity increases about 75 pascal:sec. Figure Six shows how decreasing temperature makes the TiO₂/polymer melt more viscous at constant Q/N ratio. Figure Seven shows how the “hot, high Q/N” experiment still has higher viscosity than the “cool, lower Q/N ratio” experiment by about 200 pascal:sec. Within the limits of the experiment, the modelling indicates that temperature adjustments would not have as large an impact on viscosity as increasing the Q/N ratio.

The dispersion measurements seem to corroborate the modelling results. The dispersion metric is referred to as the “screen pack dispersion” value which represents the amount of agglomerates that accumulate on a 500 mesh screen during the extrusion of a prescribed amount of a 70% TiO₂ concentrate. Hence, the higher the screen pack dispersion value, the worse the dispersion performance.

The first cursory observation to note is the reduction in screen pack dispersion values (meaning dispersion improves) as the Q/N value increases for all temperatures. There is a hint that the screen pack dispersion values start to increase as the Q/N value gets too high (dispersion quality deteriorates), but the confines of this experiment does not allow the verification of this speculation. The optimum Q/N value for this screw design seems to be near 0.10 to 0.12. This optimum Q/N is most evident when the average screen pack dispersion values are plotted with average Q/N for ALL temperatures (see Figure 8).

Figure Eight: Average screen pack dispersion values for all temperatures at for various Q/N

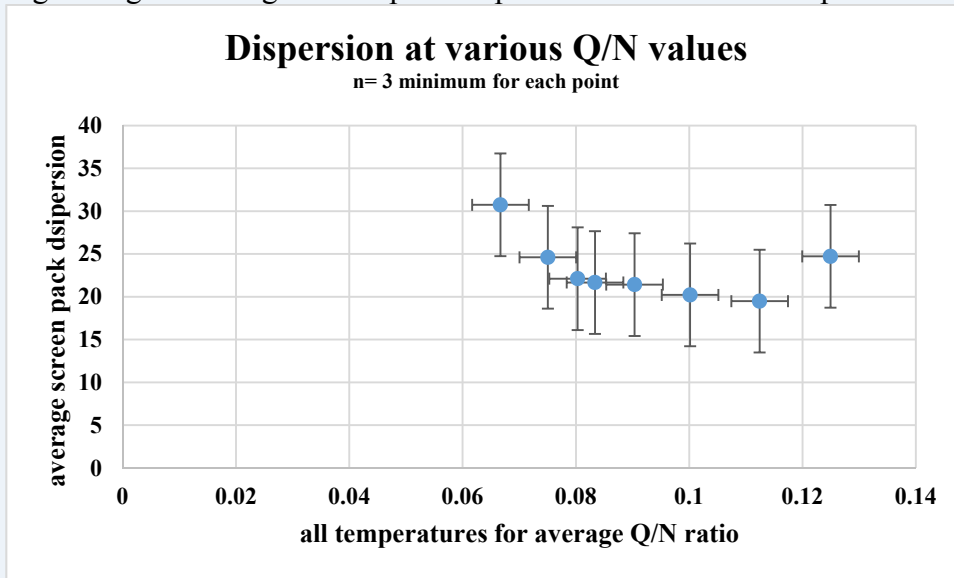


Figure Nine: Relationship of Dispersion with temperature at various Q/N values

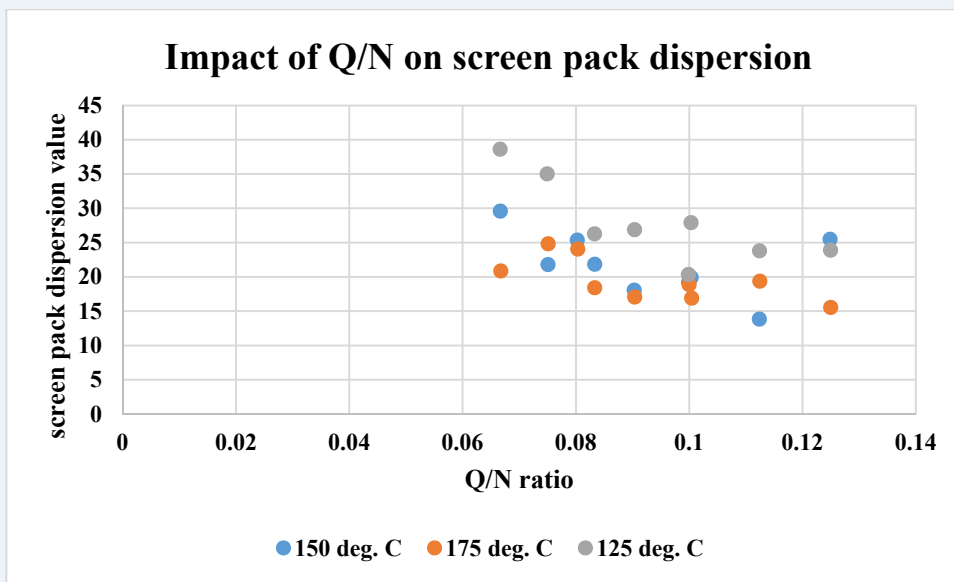


Figure 9 describes the relationship of Q/N and the screen pack dispersion measurement results at different temperatures. The role of temperature accentuates the dispersion performance at various Q/N values. The lower temperature setting of 125 deg C seems to have slightly poorer dispersion performance, especially at low Q/N values. Additionally, the dispersion improvement with Q/N increase at higher temperature was less impactful, i.e., as the temperature increased the dependency of dispersion on Q/N was less.

Summary:

The mechanism for TiO₂ agglomerate dispersion is regulated by two factors, the ability to wet the TiO₂ agglomerate with polymer and rupturing a wetted TiO₂ agglomerate. The key function of the extruder screw design is to provide the right viscosity regimes to allow the melted polymer to penetrate the agglomerate network (low viscosity) and be sticky enough to that agglomerates

rupture one another as shear is provided by the elements (high viscosity). The “trick” is to find the right operating conditions for a given screw design to find the optimum viscosity for wet-in and rupture.

Modelling of a fixed extruder element sequence was performed to note the role of Q/N on the residence time, effective viscosity and %fill factor. The %fill factor pointed out that the barrel zone 7, 8 and 9 (termed as “wet-in” section) increased as the Q/N value increased. In fact, the modelling indicated that these barrel zones are full at all Q/N values except for the initial entrance into the “wet-in” section. This observation is noteworthy because it indicates that within the confines of the experimental design for Q/N values, the TiO₂/polymer flow is not “backing out” in the wet-in section. The viscosity prediction for the wet-in section indicated that the viscosity increases with higher Q/N values (less shear at higher Q/N values). Also, the modelling pointed out that viscosity recovers in the “break” sections of the screw design to prepare the TiO₂ agglomerate to rupture. Lastly, the residence time modelling pointed out that the higher Q/N setting provided less time in the wet-in section which may harm dispersion since the TiO₂ agglomerate may not have sufficient time to wet and rupture.

The modelling pointed out favorable Q/N values for operational settings for wet-in and rupture except for temperature. Wet-in and rupture are related to viscosity which is regulated by operating temperature. Experiments were conducted at various temperatures and Q/N settings and matched with dispersion performance of a 70% TiO₂ compound. The results confirmed the modelling of an “optimum Q/N” for dispersion performance. Within the experimental conditions, the temperature range reviewed indicated a slight dependency for dispersion primarily at low Q/N values. The results indicate that hotter temperature seemed to temper the influence of Q/N, hotter temperature seemed to be less dependent on Q/N setting.

References:

- 1 “Development of a Predictive Power Law Relationship for Concentrated Slurries, Part 1: Theory”; Gregory A. Campbell; Jayaprakash. S. Radhakrishnan; Mark D. Wetzel; Michael E. Zak; ANTEC 2016 Conference Proceedings; Extrusion Division
- 2 “Development of a Predictive Power Law relationship for Concentrated Slurries Part 2; Experiment and Processing Implications”; Gregory Campbell, Ray Pettitt, Mark Wetzel; ANTEC 2016 Conference Proceedings, Extrusion division
- 3 “Modeling of Dispersive Mixing in a Twin-Screw Extruder with Three Parameter Residence Stress Distribution”; David I. Bigio, Chad Brown, Ben Dryer, Francis Flanagan, Jake Webb, Fengyuan Yang; ANTEC 2016 Conference Proceedings, Extrusion division
- 4- Niedenzu, P.M; Holtzen, D. A., “Measurement of Dispersion Quality in Thermoplastics”, SPE Color and Appearance Div. RETEC Conf. Proc., Marco Island, FL, USA, (2002), 71-81
- 5- Niedenzu, P. M., Sedar, Jr., W. T., Wetzel, M. D., “High Solids Viscosity for TiO₂ Masterbatch,” SPE Color and Appearance Division RETEC, 2011

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2017 Outstanding Achievement Award

The Outstanding Achievement Award, is now known as the “*Terry Golding Outstanding Achievement Award*” to honor past Board member, Terry Golding. The award name modification is more than appropriate because not only was Terry the primary founder and author of this program but he was and will always be remembered as the ultimate outstanding achiever.

It is with great pleasure on behalf of the CAD Board of Directors to recognize Jim Rediske as the 2017 Terry Golding Outstanding Achievement Award recipient. Jim’s dedication, commitment, and contributions to the division embodies what this award is all about. Jim has been in the Color and Appearance industry for 28 years and has been a SPE CAD board member since 2013. Because he is such an active member on the BOD it just seems like he has been on the board much longer than that. He is currently chair of the technical review committee, member of the education committee, and is also the current chair-elect of the division. He has presented many papers at both RETEC® and ANTEC® and has also received the best paper award.



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Connect With SPE CAD Via Social Media

Join SPECAD's Group On [LinkedIn](#) to network with industry peers, participate in group discussions of industry and technical topics, find job opportunities, and get the latest division and conference announcements.

Group Name: SPE Color & Appearance Division

Group ID 152108

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COLOR & APPEARANCE

Invitation to Attend Our Board Meetings

The Color and Appearance Division regularly holds Board of Director (BOD) meetings at the ANTEC® and the CAD RETEC®. In addition, a Summer BOD meeting is typically held about 6 weeks prior to the next CAD RETEC®.

The Summer meeting is scheduled in various locations. A Winter BOD meeting is held in January. The Winter meeting is typically held at a site of a future CAD RETEC®.

Any SPE CAD members who wish to attend are welcome at these meetings. If interested in attending the next Board meeting, please contact the Division Chairperson for more information.

Board Minutes

The CAD Division posts the board minutes as soon as approved and they are accessible on our website.

[Click here](#) to review our board minutes.

Color and Appearance Division

About 2017 CAD NEWS® Sponsorships

Deadline for the 2018 newsletter period is the end of December 2017.

Mark Tyler, the CAD Newsletter Editor, publishes at least (3) issues of the CAD Newsletter per calendar year. This publication is e-mailed to approximately 700 Plastic Color Industry professionals and is also posted on our website at <http://www.specad.org/> and the Parent SPE website on the Divisional pages.

In addition, the newsletter is posted on the Society of Plastics Engineers website technical area. Three (3) issues appear in electronic form annually and each sponsor placement is automatically linked directly to your website when the viewer clicks on your ad, provided you supply us with your website address. Participating in a sponsorship in the CADNEWS® is a great way to connect with plastic coloring industry professionals by promoting your company and the services you offer.

OPTIONS	HEIGHT X WIDTH
1-unit	2 x 3.5
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3-unit	6 x 3.5
4-unit	4 x 7.5
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If interested in learning more, please contact:
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Note: remove xxx after ampersand in email addresses before emailing – added here to prevent bots from capturing email.

COLOR & APPEARANCE

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