The new OptiFlex® Pro from Gema gives you the highest charging power in the industry at 110,000 V / 110 µA, allowing you to coat faster and more efficiently. Plus you can manage your application process in real time by using Gema's exclusive E-App, for total connectivity. More power, more quality, more control.

The new OptiFlex® Pro from Gema. Let’s finish it.

www.optiflexpro.com
877.437.6771
Call now to schedule a demo.
Why Join PCI?

**Networking**

Get to know your industry and be a part of career-fulfilling endeavors.

**Education**

Gain professional development from the most comprehensive, non-biased resource for powder coating education.

**Visibility**

Use your membership benefits and save on advertising, education, and events.

**Credibility**

Join one of PCI's committees to contribute to the voice of powder coating globally.

**Have a Voice**

PCI is the place to make yourself, and your company, known among your peers in the industry.

**Build Your Credibility**

Build your personal and company credibility through PCI's certification programs.

For more information on the benefits of PCI membership, and to join today, visit www.powdercoating.org.
Surface treatment technologies: High-performance processes for sustainable success

Chemetall, a global leader in applied surface treatment, offers high-performance system solutions in metalworking, cleaning, and pretreatment for a wide range of industries. Experience our innovative technologies that increase sustainability, efficiency, and economy. Trust our expertise and global availability.

800.526.4473
www.ChemetallNA.com
5 DIRECTOR’S MESSAGE
Differentiating Strategies for your Marketing Plan
PCI provides opportunities for improvement and growth. Executive Director Trena Benson outlines some of the most important in her final Director’s Message of 2019.

6 POWDER COATING WEEK 2020
A comprehensive sneak-peek at an even bigger, better powder coating conference which consists of three separate events: Powder Coating 101 Workshop, Custom Coater Forum, and Powder Coating 2020 Technical Conference & Exhibition.

14 TECHNOLOGY INTERCHANGE: EMERGING TRENDS IN POWDER COATING TECHNOLOGY
Companies and entrepreneurs are continually working to refine powder technology, such as improving the powder manufacturing process, expanding uses for functional powder coatings, and diversifying curing capabilities. Kevin Biller highlights some of the more interesting advancements being introduced to the marketplace.

19 AUXILIARY EQUIPMENT/SUPPLIES
19 CONVEYOR EQUIPMENT
Belt
Chain-on-Edge
Enclosed Track
Floor
I-Beam
Parts
Power-and-Free

19 OVENS
Convection
Convection, Gas

Cure/Force Dry/Dry Off/Boost
Electric
Infrared (IR)
IR, Electric IR
IR, Gas IR
IR, Near IR
Parts & Maintenance
Ultraviolet (UV)

20 PRETREATMENT EQUIPMENT-CHEMICAL
Headers/Risers
Immersion Pretreatment
Parts (Nozzles)
Spray Washers
Vapor Degreasers

20 PRETREATMENT EQUIPMENT-MECHANICAL
Blast Equipment
Vibratory Equipment

20 OTHER AUXILIARY EQUIPMENT/SUPPLIES
Absorbents for Chemical Spills
Air Compressors
Air Dryers
Air Filters
Air Knives
Air Makeup Systems
Air Movers
Air Purifiers
Blow-Off Equipment
Burners
Centrifugal Systems
Cleaning, Degreasing and Lubrication
Combustion Systems
Cooling
Deburring Equipment
Decorations/Decals
Environmental Rooms
Etchants
Fans/Blowers
Filters
Fire/Explosion Detection Systems
Hangers/Hooks/Racks
Heat Exchangers
HVAC
Lighting
Masking Supplies, Caps
Masking Supplies, Custom
Masking Supplies, Plugs
Masking Supplies, Tapes
Masking Supplies, Tubing and Cord
Mixers/Blenders
Personnel Lifts
Process Management
Protective Clothing
Respiratory Supplies
Rust Removers/Inhibitors
Software Systems
Steam Cleaning
Stripping Equipment, Aqueous or Dry Blasting
Stripping Equipment, Burn-Off Ovens
Stripping Equipment, Fluidized Sand
Stripping Equipment, Salt Baths
Stripping Equipment, Solvent
Tanks
Temperature Control Equipment
Temperature Profiling Equipment
Touch Up Paint, Aerosol
Touch Up Paint, Liquid Spray
Ultrasonic Cleaning Equipment
Valves
Waste Treatment

23 CONSULTING SERVICES
Powder Coating
Powder Coating Certification Programs
Product Development
Software
Systems Design
Technical Training
Third Party Testing
Troubleshooting

25 CUSTOM COATERS
Listed alphabetically by state

27 POWDER APPLICATION EQUIPMENT & BOOTH/ SYSTEM DESIGN
27 POWDER APPLICATION EQUIPMENT & BOOTH
Batch
Cartridge
Control Systems
Corona Applicators
Cyclone
Fluidized Bed
Hoppers
Maintenance Services
Oscillators
Powder Pumps
Quick Color Change
Reciprocators
Reclaim/Recovery Systems
Replacement Parts

Robots
Spray Applicators
Spray Applicators, Powder Bells
Tribo Applicators

29 SYSTEM DESIGN
Finishing Systems Engineering & Installation (Systems
Houses)
Powder Application Rooms/Clean Rooms/Environmental
Rooms

31 POWDER COATINGS/POWDER COATING
CHARACTERISTICS
31 POWDER COATINGS
Thermoplastics, Nylon
Thermoplastics, Polyolefin (PO)
Thermoplastics, Polypropylene (PP)
Thermoplastics, Polyvinylidene Fluoride (PVDF)
Thermoplastics, Vinyl
Thermoset, Acrylic
Thermoset, Epoxy
Thermoset, Fusion Bonded Epoxy
Thermoset, Hybrids
Thermoset, Polyesters

31 POWDER COATING CHARACTERISTICS
Anti-Graffiti
Antimicrobial
Architectural Grade
Clearcoats
Conductive
Electrical Insulating
FDA/NSF compliant
Fluorescents
For Heat-Sensitive Substrates (Low Cure)
Hammertones
High-Reflectance
High-Temperature Resistant
Meets Military Specs
Metals
Metals, Bonded
Near-Infrared-Curable
Pearlescents
Post-Formable
Smooths
Static Dissipating
Superdurables
Textures
UL-Approved
UV-Curable
Veins
Wrinkles
Zinc Rich Primers
40 RAW MATERIALS
- Additives
- Crosslinkers
- Extenders
- Metallics
- Pigments
- Plasticizers
- Resins

41 DISTRIBUTORS
PCI members who are solely distributors can be found here categorized by the types of products they distribute.

42 ASK JOE POWDER
Sponsored by Gema, this section is a Q&A with PCT’s technical editor, Kevin Biller.

45 MEMBERSHIP MEMO
A New Member of the PCI Family
Anthony Valerio with Frank Lowe explains the tangible value that PCI membership has brought their company.

46 POP QUIZ
Using answers that you can find in your Powder Coating: The Complete Finisher’s Handbook, compete with colleagues to win a PCI t-shirt of your own! Pop Quiz is sponsored by Nordson.

49 SUPPLIERS DIRECTORY
All PCI members are listed alphabetically. Advertisers in this edition are listed in a colored boldface font with a company logo.

59 AD INDEX
When you contact these advertisers, be sure to tell them you found them in Powder Coated Tough!

Don’t see your company listed in this Buyers Guide?
To become a PCI member and be included in our next Buyers Guide, call PCI at 859-525-9988 or visit www.powdercoating.org/join.
Differentiating Strategies for your Marketing Plan

W e have all seen the evidence of the growing need of today’s consumers to become more aware and educated about the safety, quality and sustainability of the products they choose. And with a new allegiance to social responsibility, many are not only concerned with the specifics of the products they buy, they want to understand more about the company who makes the products and the technologies involved. Enter powder coaters. It’s your opportunity to step in and educate.

The Powder Coating Institute (PCI) can help you in proclaiming the many benefits of powder coating technology. Awesome powder coaters care about their work and make a better finished product. Build your brand and enhance the consumers’ trust at the same time by using the Powder Coated TOUGH Mark. Its ‘Stronger. Greener. Better.’ proclamation quickly gets attention and differentiates your business.

Join PCI in our mission to promote powder coating technology by using the Powder Coated TOUGH Mark when promoting your business. Visit our website, www.powdercoating.org/promotepowder, to learn more. Member companies can register to use the Mark, free of charge. Use the Mark on uniforms, t-shirts, hats, storefronts, ads, social media campaigns, websites, business cards, invoices, quotations, coated products, packaging, delivery vehicles, etc. Make the use of the Mark a staple of your entire marketing strategy or the foundation of your brand identity.

Another differentiating strategy for powder coaters is PCI’s certification program for both custom coaters (PCI 3000) and OEMs (PCI 4000). PCI Certification is an extensive audit process that evaluates the powder coating operation and can show, through audited performance measurements, that they have the equipment and processes in place to correctly clean, coat and cure products. Opening your operation to this powder coating focused third-party audit can help your company achieve more consistency and reassures your potential customers of your capabilities, which raises the quality bar for our industry. The audit results will then give you a baseline for your continuous improvement plans. Over the past few years, we have made significant improvements to the program and expanded our promotion of the program into various fabrication publications. Learn more by visiting our website, www.powdercoating.org/certification.

Trena Benson, Executive Director
859-525-9988
trena@powdercoating.org
PCI Introduces Powder Coating Week

When it comes to powder coating, the Powder Coating Institute has delivered outstanding education and training to the industrial finishing industry for the past 30 years. PCI has combined the very best of their educational resources into POWDER COATING WEEK, which will take place from February 17 – 20, 2020, at the Renaissance Orlando at SeaWorld® in Orlando, FL.

The week begins with PCI’s Powder Coating 101 Workshop: The Basics and its Custom Coater Forum running concurrently on February 17 & 18. PCI’s long-running Powder Coating Technical Conference & Tabletop Exhibition will take place immediately following the first two events, from the evening of February 18 through February 20.

By bringing these programs together into a week-long event, Powder Coating Week will provide an opportunity for those across the powder coating industry to gather in one place.

The following pages contain a brief overview of Powder Coating Week 2020. Visit conference.powdercoating.org for complete presentation descriptions, registration fees, and more.
### SCHEDULE OF EVENTS

#### MONDAY, FEBRUARY 17
**POWDER COATING 101 WORKSHOP AND CUSTOM COATER FORUM**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 AM</td>
<td>Registration Opens</td>
</tr>
<tr>
<td>1:00 – 5:00 PM</td>
<td>Powder Coating 101 Workshop: The Basics</td>
</tr>
<tr>
<td>1:00 – 5:00 PM</td>
<td>PCI Custom Coater Forum</td>
</tr>
<tr>
<td>5:00 – 6:00 PM</td>
<td>Reception for Workshop &amp; Forum Attendees</td>
</tr>
</tbody>
</table>

#### TUESDAY, FEBRUARY 18
**POWDER COATING 101 WORKSHOP, CUSTOM COATER FORUM & TECHNICAL CONFERENCE RECEPTION**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM</td>
<td>Registration Opens</td>
</tr>
<tr>
<td>8:00 – 8:30 AM</td>
<td>Breakfast for Workshop &amp; Forum Attendees</td>
</tr>
<tr>
<td>8:30 AM – 4:30 PM</td>
<td>Powder Coating 101 Workshop: The Basics</td>
</tr>
<tr>
<td>8:30 AM – 4:30 PM</td>
<td>PCI Custom Coater Forum</td>
</tr>
<tr>
<td>Noon – 1:00 PM</td>
<td>Lunch for Workshop &amp; Forum Attendees</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>Workshop &amp; Forum Conclude</td>
</tr>
<tr>
<td>8:30 PM</td>
<td>After Hours Welcome Reception for the Technical Conference</td>
</tr>
</tbody>
</table>

#### WEDNESDAY, FEBRUARY 19
**POWDER COATING 2020 TECHNICAL CONFERENCE AND EXHIBITION**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 AM</td>
<td>Registration Opens</td>
</tr>
<tr>
<td>7:30 – 9:00 AM</td>
<td>Opening Breakfast &amp; Keynote Address</td>
</tr>
<tr>
<td>9:15 – 11:00 AM</td>
<td>Breakout Sessions</td>
</tr>
<tr>
<td>11:00 AM – 1:00 PM</td>
<td>Lunch and Tabletop Exhibition Open</td>
</tr>
<tr>
<td>1:15 – 4:15 PM</td>
<td>Breakout Sessions</td>
</tr>
<tr>
<td>4:30 – 6:30 PM</td>
<td>Reception and Tabletop Exhibition Open</td>
</tr>
</tbody>
</table>

#### THURSDAY, FEBRUARY 20
**POWDER COATING 2020 TECHNICAL CONFERENCE AND EXHIBITION**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:15 AM</td>
<td>Registration Opens</td>
</tr>
<tr>
<td>7:30 – 9:15 AM</td>
<td>Breakfast with Roundtable Discussions</td>
</tr>
<tr>
<td>9:30 – 11:00 AM</td>
<td>Breakout Sessions</td>
</tr>
<tr>
<td>11:00 AM – 1:00 PM</td>
<td>Lunch and Tabletop Exhibition Open</td>
</tr>
<tr>
<td>1:15 – 3:30 PM</td>
<td>Breakout Sessions</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>Closing Session &amp; Montana Trip Giveaway</td>
</tr>
<tr>
<td>3:45 PM</td>
<td>Powder Coating 2020 Technical Conference Concludes</td>
</tr>
</tbody>
</table>

### REGISTRATION

To register for any of the Powder Coating Week 2020 events, visit conference.powdercoating.org and click the **REGISTER** button at the top of the page. See pricing and a complete listing of registration options at the back of this brochure. Combination discounts are available for attendees registering for both the two-day Technical Conference and either the Powder Coating 101 Workshop or the Custom Coater Forum. **Register by January 10 to receive the lowest rates.**
PCI’s Powder Coating 101 is a one-and-a-half day workshop that introduces attendees to powder coating by focusing on materials, application, reclamation, testing & evaluation, quality control, the powder manufacturing process and much more. Attendees will gain knowledge of powder coatings and the powder coating process from industry experts as well as have the opportunity to network with speakers and other attendees during a reception on day 1 and lunch on day 2. This PCI training workshop is unbiased and commercial free and provides a great foundation for the technical conference that follows later in the week.

Here are some comments from last year’s Powder Coating 101 attendees:

- “Overall, the workshop has helped me out in many aspects. Very effective class, happy I attended.”
- “This has been a great program. I learned a lot that I will be able to take back and use on the job.”
- “The workshop was enjoyable and well put together. Speakers were very knowledgeable.”
- “I’m a newbie, very good info.”
- “I’ve learned a lot about the process of coating and many of the technical things that need to be done.”

PCI’s Custom Coater Forum is designed for custom coaters to network with peers and industry leaders, hear presentations on timely issues important to their business and participate in roundtable discussions that allow for sharing information. The event includes a reception on day 1 and lunch on day 2.

The Forum will feature the following presentations:

**Powder Coating Industry and Quality Standards**
Marty Korecky, AkzoNobel Powder Coatings

**Lean Principles**
Doug Atkin, Optimization Consulting

**Key Metrics and Profitability for Custom Coating Businesses**
Tim Milner, J.I.T. Powder Coating

**Business Continuity Planning**
Rick Gehman, Keystone Koating, LLC

**Reviewing Key Metrics for Products Finishing Magazine’s Top Shops Program**
Tim Pennington, Products Finishing Magazine

**Understanding the Needs of the Architectural and Agricultural, Construction and Equipment (ACE) Markets**
Michael Withers, Axalta Coating Systems

**Buying/Selling Your Custom Coating Business Panelists:**
G.R. Kearney, Acme Finishing
Dennis Walters, Acme Finishing
John Heyer, Kettle Moraine Coatings

**Improving Quality in Our Industry**
Sheila LaMothe, Goyer Management & Michelle Payden, ABITL Finishing

**Instagram and Facebook Strategies for Growth**
Troy Newport, Goyer Management

**Roundtables: Strategies for Growing Your Customer Base**
PCI’s Powder Coating Technical Conference has been offering outstanding education to the industry for the past 32 years! The technical conference features general sessions of interest to all powder coaters, breakout sessions covering all aspects of powder coating and a tabletop exhibition, allowing for networking, learning and conversation with exhibitors and other powder coaters. This is your chance to learn about the latest innovations and explore all things powder coating! Review our keynote and breakout sessions on the following pages and register now!

Check out a few of the comments from last year’s Technical Conference Attendees:

- “Very well-run conference; clear and concise.”
- “I learned a lot!”
- “Awesome content; very relevant material.”
- “Speakers were helpful and knowledgeable on respective topics!”
- “Great enthusiasm at this event.”

TECHNICAL CONFERENCE PROGRAM

Read through the wide variety of sessions and presentations available during PCI’s Powder Coating 2020 Technical Conference. Review them closely then select your sessions during the registration process. You will be able to switch sessions on-site, but pre-selection of sessions helps immensely in setting each room with the appropriate number of seats.

KEYNOTE PRESENTATION | Wednesday, February 19; 7:30 - 9:00 AM

Sweat the Small Stuff - Attention to Detail Helps You Create a Workplace Culture that ROCKS!
Lisa Ryan, Grategy

In a full-employment economy, employees have a choice – do they stay with their company or take their skills to the competition? In this entertaining, engaging and fun program, you’ll learn specific strategies that you can put into practice immediately which when applied consistently, create a workplace culture where people want to come to work and stay working.

Here are just a few of the things we’ll cover:

- Why the focus should be on employees who are doing things well, instead of those who are sucking the life out of a company.
- How to build your company’s reputation as a great place to work.
- How to tackle the generational divide and ensure boomers, millennials and Gen Z “play nice” with each other.
- How many of these ideas work in your personal life as well.

Paying attention to the small stuff can make all the difference in your business. Take these ideas back to your company and encourage positive changes that build a positive culture.
NEW TECHNOLOGIES TRACK
1:15 – 4:15 PM
NOTE: Speakers in this session are permitted to use commercial brand names to explain the new technology.

Zirconium-Based Cleaner-Coater with Improved Low Temperature Performance
David Montrose, Henkel Corporation

Breaking the Voltage Barrier with PowerBoost Technology-110,000 Volts & 110 micro amps
Jeff Hale, Gema USA, Inc.

Flexible, Automated, Cutting Edge Material Handling
Chad Andreae, Thera-Tron-X, Inc.

Powders Coatings for Extreme Edge Coverage and Corrosion Protection
Kathryn Shaffer, PPG Industrial Coatings

OptiStar All-In-One, Combining Delivery and Application Control Into One Compact Device
Chris Merritt, Gema USA, Inc.

Inertial Powder Separation – A New Direction in Powder Booth Design
Larry Savage, Particle Recovery, LLC

Non-Reactive vs. Reactive Pretreatments
Sergio Mancini, Bulk Chemicals, Inc.

LayerCheck Device
Hector Flores, Wagner Industrial Solutions

Tabletop Exhibition and Reception will be open from 4:30 - 6:30 PM

BATCH TRACK
1:15 – 4:15 PM

Effective and Efficient Batch Powder Coating Systems
Mike Withers, Axalta Coating Systems
Greg Dawson, Nordson Corporation
John Sudges, Midwest Finishing Systems

Evolution of a Batch System Operation: A Fabricator’s Case Study
Marty Sawyer, Trimac Industrial Systems, LLC
Neal Spencer, Ernest-Spencer Metals Inc.

What a Mess…Keep the Powder in Your Booth!
Frank Mohar, Nordson Corporation

AUTOMATION TRACK
All Day Track

Is an Automated System Right for You?
Nick Liberto P.E., Powder Coating Consultants

Pretreatment Considerations for Process Changes
Kirk Beaster, BASF/Chemetall

Industry 4.0 and IIoT, Something for Everyone
Bobby Benson, Nordson Corporation

How is IoT Helpful to Me?
Hector Flores, Wagner Industrial Solutions

Demonstration of a State-of-the-Art Automated Finishing Control System
John Claman, IntelliFinishing

Robotics Presentation
Barton Faylor, FANUC Robotics Americas, Inc.

Tolliver Powder Coating Case Study
Mark Folcik, Nordson Corporation
Brandon Greer, Tolliver Powder Coating

MARKET TRACK
9:15 – 11:00 AM

Tattoo Your Metal with Sublimation Technology!
Marco Menin, Memphis s.p.a

Curing Heat Sensitive Substrates: Tricks of the Trade
Marty Sawyer, Trimac Industrial Systems, LLC

Architectural Aluminum
Steve Edens, Henkel Corporation

WEDNESDAY, FEBRUARY 19

TROUBLESHOOTING TRACK
9:15 – 11:00 AM

Best Practices for Operating Your Cartridge Booth System
Mark Folcik, Nordson Corporation

What Is This Stuff…Can We Clean It?
Ken Kaluzny, Coral Chemical Company

Be Nice to Mother Earth! How to Remove Oils & Soils from Your Wastewater and Recycle Your Aqueous Cleaning Solutions
Ray Graffia, Arbortech Corporation
FORMULATION TRACK
All Day Track

NOTE: Many of the presentations in this session include new technologies where speakers are permitted to use commercial brand names to explain the new technology.

Polyester Powder Resins for One Shot Matte Application
Paul Buijse, DSM Coating Resins

New Generation Reactive Matting Additive for Epoxy and Hybrid Powder Coatings
Atman Fozdar & Ronald Lewarchik, Chemical Dynamics LLC

FEVE Fluoropolymer Resins for Highly Weatherable and Corrosion Resistant Coatings
Hongli Wang, AGC Chemicals Americas

New Antistatic Powder Coatings
Jongchun Oh, KCC Corporation

Graphene/Wax Composites for Anticorrosion
Rich Czarnecki, Micro Powders, Inc.

Multifunctional Additives for Powder Coatings
Michael Watson & Mouhcine Kanouni, Clariant Additives

Specialty Crosslinkers for Improved Powder Coating Properties
Bernd Knobloch, EMS-GRILTECH

High Weatherability Powder Paint for Automotive Exterior Parts and Weatherproofing Method
Hwang Sangok, KCC Corporation

MAXIMIZING EFFICIENCIES TO MAXIMIZE PROFITS TRACK
All Day Track

Guide to Purchasing a Finishing System
Rich Saddler, Industrial Finishing Solutions LLC

Real Cost to Powder Coat
Mike Withers, Axalta Coating Systems

Improved Efficiency Through Racking: How to Eliminate Wasted Labor and Space
Isaiah Haley, Production Plus/Magic Rack

Optimizing Quality and Material Consumption with Non-Contact Film Thickness Measurement
Martin Rola, Sapience Automation

Benefits of Automating Industrial Finishing Door Systems
Zach Morrow, RollSeal, Inc.

TESTING & MEASUREMENT TRACK
9:30 – 11:00 AM

Know Your Options
Mike Beamish, DeFelsko Corporation

Study to Measure Mechanical Properties like Hardness, Elastic Modulus, Creep and Much More of a Variety of Powder Coatings using Nanoindentation
Rahul Nair, Fischer Technology, Inc.

POWDER COATING DONE RIGHT
1:45 – 3:30 PM

CLOSING SESSION & MONTANA TRIP GIVEAWAY
3:30 – 3:45 PM

Join us as we wrap up Powder Coating Week 2020 and end with a very special giveaway - a trip to PCI’s 2020 Annual Meeting from June 22 – 24, 2020, in Whitefish, Montana, near Glacier National Park. The trip includes a 3-night stay at the host hotel; complimentary registration to the meeting and $500 towards airfare for the lucky winner. The prize does not include optional activities fees. Winner must pay for any optional activities in which they wish to participate. Prize is non-transferable.

Giveaway value: $2,300

For complete session descriptions, registration fees, hotel information and to register, visit conference.powdercoating.org!
Tabletop exhibitors are listed as of September 20, 2019. Tabletop exhibitors are added frequently, so be sure to check our website for an up-to-date listing.

ACT Test Panels, LLC
AkzoNobel Powder Coatings
Arkema Coating Resins
Axalta Coating Systems
BASF/Chemetall
BCI Surface Technologies
BYK-Gardner USA
Calvary Industries, Inc.
Canadian Finishing & Coatings Manufacturing Magazine
Caplugs/Shercon
Chemical Coaters Association International
DeFelsko
Digilube Systems
Dinamec Systems, LLC
DuBois Chemicals
Elcometer, Inc.
EPSI Masking Solutions
Fischer Technology, Inc.
Fostoria Process Equipment, Div. of TPI Corp.
Gema USA, Inc.
George Koch Sons
Global Finishing Solutions
Henkel Corporation
IFS Coatings
IntelliFinishing
Keyland Polymer UV Powder, LLC
Link Color NA Inc.
Magic Rack/Production Plus
Menphis s.p.a.
Midwest Finishing Systems
Nordson Corporation
Parker Ionics
Patriot Powder Coatings
PEM Inc.
Pneu-Mech Systems Mfg., Inc.
Powder Coated Tough
The Powder Coating Institute
PPG Industries
Products Finishing
RollSeal, Inc.
SAMES KREMLIN
The Sherwin-Williams Company
TCI Powder Coatings
Therma-Tron-X, Inc.
Trimac Industrial Systems, LLC
Wagner Industrial Solutions

Blue type indicates a PCI Member Company

Thank you to our Powder Coating Week 2020 sponsors!

![Sponsors Logos]

www.powdercoating.org
Two world leaders in **industrial process fluids**, Quaker Chemical and Houghton International, are now one company with one mission: to keep our customers ahead in a changing world.

If it’s made of metal, if it’s rolled, cut, drawn or cast, Quaker Houghton is there, optimizing processes, reducing costs, advancing safety and sustainability, and driving progress. Quaker Houghton is proud to partner with the businesses that are helping the world’s economy grow and prosper.
Emerging Trends in Powder Coating Technology

by Kevin Biller

On the eve of MMXX, the year which marks the 65th anniversary of the original powder coating patent authored by Erwin Gemmer, we offer a review of the most recent breakthroughs in powder coating technology. Gemmer, if you recall, patented a novel process to coat preheated hand tools with a thick film by dipping them into a fluidized bed of thermoplastic particles. Over the ensuing decades, wise formulators and engineers advanced powder coating technology beyond Gemmer’s wildest dreams to create the thin-film world of thermosetting chemistries possessing remarkable durability, performance and economics.

As requirements for improved performance in extreme working environments have emerged and the ever-present need for exacting process control and reasonable economics continues, technologists have stepped up to the plate to deliver the goods. Functional coatings are being pushed to perform in harsher environments, including more aggressive chemicals and higher operating temperatures. Architects are looking to the powder coating industry for a finish that can withstand 20 to 30 years of sunlight, precipitation and various other environmental attacks. Consumers are demanding more durable finishes on more diverse surfaces. Regulation and public sentiment continue to guide manufacturers toward more environmentally-friendly processes.

In this Buyers Guide edition of Technology Interchange we look at advancements in powder coating technology, equipment, and process improvements that, with all of the aforementioned pressures, continue to answer the call.

Functional Coatings

Functional coatings are typically used in extreme environments where the ultimate in corrosion and chemical resistance are required. Good examples are powders designed to coat pipelines and rebar. Energy companies are accessing crude oil and natural gas in harsher environments and using more aggressive means of extraction. The drilling equipment and corresponding pipelines need to withstand temperatures as high as 177 degrees Celsius (350 degrees Fahrenheit). Conventional functional powders, often described as fusion bonded epoxies because of the manner in which they are applied and cured, can withstand temperatures in the 120 to 135 degrees Celsius (250 to 275 degrees Fahrenheit) range. Recent advances in epoxy resin technology and powder formulating have pushed that boundary.

Functional powder coatings with very high Tgs (glass transition temperatures) can be formulated thanks to...
innovations in epoxy resins by the Kukdo Chemical Co. Ltd. Polymer scientists there have developed a unique powder coating grade resin, KD-2012H, that yields coatings with a Tg of over 160 degrees Celsius (320 degrees Fahrenheit). (The significance of cured film Tg is that it marks thermal performance that allows the coating to maintain integrity at or just below that temperature.) Olin Chemical (formerly Dow Chemical product line) has developed an epoxy resin, DER 6510HT, that can be used to create cured powder coatings with a Tg as high as 170 degrees Celsius (338 degrees Fahrenheit). Both of these unique resins are commercially available.

SABIC, a relative newcomer to the powder coating industry, has developed epoxy resins that have the ability to produce cured film Tgs up to 200 degrees Celsius (392 degrees Fahrenheit). This unique chemistry is dubbed PPPBP-Epoxy and was presented last year at a major powder coating technology event. SABIC’s PPPBP-Epoxy can be used as a modifier resin with more conventional epoxy resins to dial in a specific Tg or as a sole resin crosslinked with either a phenolic or DICY-based curing agent.

Not only do functional coatings require durability at high operating temperatures, they also need excellent chemical resistance to handle fracking chemicals and proppants (e.g., sand, bauxite or ceramics). Kukdo has developed an epoxy resin, KD-9211, which is based on Bis-Phenol F with a long molecular chain. They recommended combining it with a multi-functional epoxy novolac and cure with a phenolic hardener. The resulting coating provides a highly chemical resistant surface capable of withstanding a barrage of aggressive compounds.

Another key property of functional coatings is resistance to moisture. Hydraulic fracking requires the use of aqueous media. In addition, pipelines can also be used for the transport of hot water and steam. Kukdo has developed a high humidity-resistant hardener for epoxy-based powder coatings. Laboratory tests have shown that powder coatings based on this phenolic hardener, KD-420A, maintain adhesion after nine days of immersion in 90 degrees Celsius (194 degrees Fahrenheit) water.

Adhesion to stainless steel and non-ferrous metals such as aluminum, magnesium and titanium alloys is always a challenge for the powder coating formulator. Kukdo has developed an epoxy resin, KSR-950, that incorporates a silane pendant group which provides a significant improvement in adhesion compared to conventional epoxies. Test results show a powder based on KSR-950 maintains adhesion to un-pretreated aluminum substrates after 24 hours submersion in 90 degrees Celsius (194 degrees Fahrenheit) water.

Low-Temperature Cure Polyesters

Stepan Company has developed a new LTPC (low temperature powder coatings) carboxyl polyester resin, Rucote 9900, designed for cure with TGIC. This resin exhibits excellent cure performance and appearance with bakes as low as 130 degrees Celsius (266 degrees Fahrenheit).
Advancements in powder binder technology have improved powder coating capabilities on heat-sensitive substrates such as MDF (medium density fiberboard).

Targeted end-uses include assemblies that are comprised of multi-components that have some parts that cannot endure typical high bake temperatures, finishing lines seeking lower temperature oven economics and higher speed coating lines with short oven residence time.

Allnex has developed a comprehensive range of low-temperature cure polyesters designed to be cured with epoxy resins (hybrids), TGIC, β-hydroxy alkyl amide (HAA) and Araldite™ PT-910. Hybrid and PT-910 cure is claimed to be as low as 150 degrees Celsius (302 degrees Fahrenheit), whereas these specialized polyesters can cure as low as 140 degrees Celsius (284 degrees Fahrenheit) with TGIC. Low-temperature curing polyesters designed for cure with HAA can be processed as low as 160 degrees Celsius (320 degrees Fahrenheit). This sales range of polyesters is focused on meeting the needs of heavy substrates, pre-assembled goods and heat-sensitive substrates such as plastics and engineered boards.

DSM has continued to optimize their Uralac® Ultra line of low-temperature cure polyester-based powder binders. This system is comprised of an unsaturated polyester and a divinyl ether curing agent and is said to cure as low as 120 degrees Celsius (248 degrees Fahrenheit). The target market for this technology is replacing liquid paint and/or laminates on MDF (medium density fiberboard). Infrared curing is recommended to speed up the cure speed of this unique technology. Cure times in as little as three minutes are achievable according to DSM.

**Film Thickness Measurement**

Evaluating film thickness on a coated (and cured) part is easy due to magnetic and eddy current instrumentation technology developed decades ago. Film thickness gauges are compact, easy to use and relatively inexpensive. Every powder coating finishing line and laboratory should have one or more of them. Measuring the film thickness of an uncured powder layer is not so easy. Enterprising engineers have developed ultrasonic devices that can get the job done but are sometimes cumbersome when switching powder coating products and substrates. Recent advances have offered an alternative to these ultrasonic devices.

Winterthur Instruments AG, and their flagship product, the Coatmaster, have developed a non-contact means to measure the film thickness of both uncured and cured powder coatings. This technology is called ATO (Advanced Thermal Optics) and is based on the thermodynamics of a layer of powder and the temperature change that occurs as it warms the powder. Following the light pulse, high-speed infrared sensors detect the rate at which the material cools. Using proprietary algorithms, the Coatmaster is able to translate this rate of cooling to a highly accurate film thickness measurement. The time to take a reading varies by application, but is typically 100-300 milliseconds, and individual point readings can occur as quickly as once every 1.5 seconds.

The Coatmaster device can be mounted at distances from two to 48 inches and can read parts traveling as fast as 350 feet per minute.

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per minute. Data can then be captured and processed by quality control software that can emit alarms and analyze trends.

High Durability Pigments

Formulators now have more choices in high-performance colorant pigments. Shepherd Color has partnered with Oregon State University to bring YInMn (yttrium-indium-manganese) blue to the coatings and allied industries. This dark blue shade of inorganic pigment based on mixed metal oxides has high solar reflectivity, which is conducive to cool surfaces on roofs and other architectural applications. In addition, it has excellent UV durability, chemical resistance and IR properties.

Shepherd Color has also introduced micro-mirror technology based on silver coated glass flakes. These special effect pigments, dubbed StarLight, offer remarkable reflectance and sparkle and are designed for the transportation, architectural, electronics and consumer goods markets.

Antimicrobial

Poly Group, LLC has developed a novel antimicrobial technology based on positively charged compounds that attack and destroy negatively charged pathogens. This technology, named Nouvex™, creates no chemical binding or linking issues, unlike other quaternary ammonium compounds, and has a large molecular structure providing limited toxicity. Nouvex™ has proven performance through licensed laboratory testing, so the EPA preservative and health claims will be accessible to the end-use product manufacturers. This makes Nouvex™ a potential replacement for silver ions, triclosan, copper, and other quaternary substances with little or no process modification.

Processing Technology

Advancements have been made in how powder coatings are manufactured. Specifically, extrusion equipment companies have listened to powder operations managers and have designed feed systems that can accommodate difficult-to-feed premixes and materials. Some powder formulations are based on lightweight, low-density materials and have a tendency to build in extruder feed ports causing unwanted surging and variable torque. Material builds up in the feed zone and seriously compromises throughput and therefore, processing economics.

Baker Perkins’ Max³ feed system is based on a redesigned feed port and screw design which significantly improves the consistent flow of material into the extruder. Pilot plant studies show outputs of difficult-to-feed materials increased as much 34 percent. This innovative feed system is available on all new machines and as a retrofit option on existing machines ranging from the MPX24 up to MPX80 model.

YInMn (yttrium-indium-manganese) blue has high solar reflectivity, which is conducive to cool surfaces on roofs and other architectural applications.
Laser Curing

PhotoFusion Technologies, Inc., has developed a novel technique to cure powder coatings. Everyone is quite familiar with convection ovens and perhaps to a lesser extent the varieties of infrared curing technology available to heat and cure thermosetting powder coatings. PhotoFusion Technologies, Inc., takes powder coating curing to a whole different level with their laser technology. Basically, the way the technology works is by applying powder to a surface and then melting and curing it with a moving patch of laser-directed light. The laser in this case is diffused and forms a large pattern that is traversed over the powder coated surface. Within seconds the powder layer melts, flows and cures to a hard, durable finish.

PhotoFusion Technologies, Inc., sees opportunity to revolutionarily change the heat-sensitive substrate market including composites and a myriad of plastics. These processes are expected to impact the automotive graphics and aerospace industries, among others. In addition, the ability to deliver high intensity energy to a surface could open up opportunities in the petrochemical industry where heavy-duty assets may be able to be coated and cured in the field.

Powder coating technology is not sitting still. Clever scientists, formulators and engineers are solving age-old problems with technological breakthroughs and energetic entrepreneurs are finding new opportunities to expand the reach of the highest quality, most environmentally-compliant finishing technology. The increasingly more demanding needs of the pipe coatings industry are now being addressed by innovative work at the resin manufacturers. Technologists continue to chip away at expansion into new markets by developing extraordinary new curing technology with lasers. Their breakthroughs may be able to open untapped markets that utilize heat-sensitive substrates. And the age-old powder coating processing issue regarding low-density materials has been tackled by the pioneering engineers at extruder companies.

Companies mentioned in this article:

SAIBC - www.sabic.com
Kukdo Chemical Co., Ltd. - www.kukdo.com
Stepan Company - www.stepan.com
Allnex - www.allnex.com
DSM Coating Resins - www.dsm.com
The Shepherd Color Company - www.shepherdcolor.com
Poly Group LLC - www.polygroupllc.net
Baker Perkins - www.bakerperkins.com
Winterthur Instruments AG - www.coatmaster.ch
PhotoFusion Technologies, Inc. - www.photofusiontech.com

Kevin Biller is technical editor of Powder Coated Tough and president of The Powder Coating Research Group.
Dear Joe,

My problem is that a customer wants a white powder paint (very white), and all those that I have applied are too yellowish. Is there a solution?

Overbaking (high temperature and/or extended time) will cause yellowing as well, so it is imperative to keep your oven burner adjusted properly and to avoid overbake conditions. Incorrectly adjusted gas/air mixtures will cause more resistance. So be sure to evaluate more than one version of these types of powders.

Some guidelines to allow you to provide the whitest “very white” is a relative term, I think I can still provide your customer requests a very white powder. While powders can be formulated to approximate the appearance of anodized silver. It won’t be an exact match but will come pretty close. This will be a low gloss metallic effect, and recently powder companies have offered them as a specialty product line.

On the other hand, if the customer wants an exact match but will come pretty close. This will be a low gloss metallic effect, and recently powder companies have offered them as a specialty product line.

Hi Joe,

I hope that this helps solve your problem.

Best regards,

Ron

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Continued on page 20

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- George Koch Sons, LLC
- Trimac Industrial Systems, LLC

**Immersion Pretreatment**
- Chemetall US, Inc.
- Coral Chemical
- EnviroServe Chemicals, Inc.
- General Fabrications Corporation
- George Koch Sons, LLC
- Henkel Corporation

**Parts (Nozzles)**
- Coral Chemical
- CPR Systems
- General Fabrications Corporation
- George Koch Sons, LLC
- Henkel Corporation
- Pneu-Mech Systems Mfg.
- SAMES KREMLIN

**Spray Washers**
- Col-Met Engineered Finishing Solutions
- CPR Systems
- Fostoria Process Equipment, Div. of TPI Corp.
- General Fabrications Corporation
- George Koch Sons, LLC
- Henkel Corporation
- IntelliFinishing

**Vapor Degreasers**
- EnviroServe Chemicals, Inc.
- George Koch Sons, LLC
- Henkel Corporation

**Pretreatment Equipment, Mechanical**

**Blast Equipment**
- Elcometer, Inc.
- TQC-USA, Inc.

**Vibratory Equipment**
- Nordson Corporation
- SAMES KREMLIN

**Other Auxiliary Equipment/Supplies**

**Absorbents for Chemical Spills**
- Chemetall US, Inc.

**Air Compressors**
- Digilube Systems

**Air Dryers**
- Digilube Systems
- Gema USA, Inc.
- General Fabrications Corporation

**Air Filters**
- General Fabrications Corporation
- Nordson Corporation

**Air Knives**
- General Fabrications Corporation
- Intek Corporation
- Therma-Tron-X, Inc.

**Air Makeup Systems**
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- General Fabrications Corporation
- Global Finishing Solutions
- Intek Corporation
- Pneu-Mech Systems Mfg.
- Therma-Tron-X, Inc.

**Air Movers**
- General Fabrications Corporation

**Air Purifiers**
- Elcometer, Inc.

**Blow-off Equipment**
- Therma-Tron-X, Inc.
- General Fabrications Corporation
- IntelliFinishing

**Burners**
- General Fabrications Corporation
- Global Finishing Solutions
- Intek Corporation
- Therma-Tron-X, Inc.

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- Arkema Coating Resins
- Danick Specialties & Support, Inc.
- Estron Chemical, Inc.
- Sumitomo Corporation of Americas
- Sun Polymers International, Inc.
- Teknor Apex
- Troy Corporation

Crosslinkers
- Danick Specialties & Support, Inc.
- Estron Chemical, Inc.
- Sun Polymers International, Inc.
- Sumitomo Corporation of Americas
- Teknor Apex

Extenders
- Danick Specialties & Support, Inc.
- Teknor Apex

Metallics
- Teknor Apex

Pigments
- Teknor Apex

Plasticizers
- Teknor Apex

Resins
- AGC Chemicals Americas
- Arkema Coating Resins
- Estron Chemical, Inc.
- Indorama Ventures Xylenes & PTA, LLC
- Stepan Company
- Sun Polymers International, Inc.
- Teknor Apex

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Centrifugal Systems
- Chemetall US, Inc.

Cleaning, Degreasing and Lubrication
- Chemetall US, Inc.
- Digilube Systems
- Hedson Technologies North America
- Henkel Corporation
- Kolene Corporation
- Torch Surface Technologies

Combustion Systems
- Intek Corporation

Cooling
- Eaton Fabricating Co., Inc.
- IntelliFinishing

Pneu-Mech Systems Mfg.
- Trimac Industrial Systems, LLC

Deburring Equipment
- Heraeus Noblelight America, LLC

Decoration/Decals
- EPSI Masking Solutions
- Memphis s.p.a.

Environmental Rooms
- George Koch Sons, LLC
- Global Finishing Solutions
- IntelliFinishing
- Midwest Finishing Systems, Inc.

Pneu-Mech Systems Mfg.
- Therma-Tron-X, Inc.

Etchants
- Henkel Corporation
- Torch Surface Technologies

Fans/Blowers
- Fostoria Process Equipment, Div. of TPI Corp.
- Gema USA, Inc.

Global Finishing Solutions
- Intek Corporation
- Therma-Tron-X, Inc.

Filters
- Chemetall US, Inc.
- Col-Met Engineered Finishing Solutions
- Digilube Systems
- EPSI Masking Solutions
- Gema USA, Inc.

Global Finishing Solutions
- Intek Corporation

Hangers/Hooks/Racks
- AikenControls
- Caplugs/Shercon
- Custom Fabricating & Supplies
- EPSI Masking Solutions

Heat Exchangers
- Pneu-Mech Systems Mfg.

HVAC
- Pneu-Mech Systems Mfg.

Lighting
- Col-Met Engineered Finishing Solutions
- Fostoria Process Equipment, Div. of TPI Corp.
- Global Finishing Solutions

Masking Supplies, Caps
- Caplugs/Shercon
- Custom Fabricating & Supplies
- Echo Engineering & Production Supplies, Inc.
- EPSI Masking Solutions
- Mighty Hook, Inc.
- MOCAP

Masking Supplies, Custom
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- Echo Engineering & Production Supplies, Inc.
- EPSI Masking Solutions
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- Magic Rack / Production Plus
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- EPSI Masking Solutions

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- Nordson Corporation

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- Digilube Systems
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PCI Certification is an extensive audit program that evaluates powder coating processes and procedures, equipment, maintenance practices, and quality control to ensure the coater has the capability of producing a high-quality powder coated product. To learn more about PCI Certification, visit www.powdercoating.org/certification.
POWDER APPLICATION EQUIPMENT & BOOTHS

Batch
- BUSS, Inc. USA
- Carlisle Fluid Technologies
- Col-Met Engineered Finishing Solutions
- Fostoria Process Equipment, Div. of TPI Corp.
- Gema USA, Inc.
- General Fabrications Corporation
- George Koch Sons, LLC
- Global Finishing Solutions
- Heraeus Noblelight America, LLC
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- Therma-Tron-X, Inc.
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Cartridge
- Carlisle Fluid Technologies
- Col-Met Engineered Finishing Solutions
- Gema USA, Inc.
- General Fabrications Corporation
- Global Finishing Solutions
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Control Systems
- Calvary Industries, Inc.
- Carlisle Fluid Technologies
- Chemetall US, Inc.
- Col-Met Engineered Finishing Solutions

Gema USA, Inc.
- General Fabrications Corporation
- George Koch Sons, LLC
- Heraeus Noblelight America, LLC
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- Rohner
- SAMES KREMLIN
- Therma-Tron-X, Inc.
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Corona Applicators
- Gema USA, Inc.
- Nordson Corporation
- Parker Ionics
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Cyclone
- Carlisle Fluid Technologies
- Gema USA, Inc.
- Nordson Corporation
- Parker Ionics
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Fluidized Bed
- BUSS, Inc. USA
- General Fabrications Corporation
- George Koch Sons, LLC
- Pneu-Mech Systems Mfg.
- SAMES KREMLIN
- Therma-Tron-X, Inc.
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Hoppers
- BUSS Inc. USA
- Gema USA, Inc.
- General Fabrications Corporation
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- SAMES KREMLIN
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Maintenance Services
- Gema USA, Inc.
- George Koch Sons, LLC
- Parker Ionics
- Trimac Industrial Systems, LLC

Oscillators
- Gema USA, Inc.
- Nordson Corporation
- Parker Ionics
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Powder Pumps
- Gema USA, Inc.
- Nordson Corporation
- Parker Ionics
- SAMES KREMLIN
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Quick Color Change
- Carlisle Fluid Technologies
- Gema USA, Inc.
- General Fabrications Corporation
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- SAMES KREMLIN
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Reciprocators
- Carlisle Fluid Technologies
- Gema USA, Inc.
- General Fabrications Corporation
- Nordson Corporation
- Parker Ionics
- Pneu-Mech Systems Mfg.
- SAMES KREMLIN
- Trimac Industrial Systems, LLC
- Wagner Industrial Solutions

Reclaim/Recovery Systems
- Carlisle Fluid Technologies
- Col-Met Engineered Finishing Solutions
- Gema USA, Inc.
- Global Finishing Solutions
- Nordson Corporation

Continued on page 28
Process Verification Kits are a customized set of test panels used to monitor your paint and finishing lines. Each Process Verification Kit is personalized to match the substrate(s) and pretreatment used in your finishing line. Contact sales@acttestpanels.com or call (517) 439-1485 for more information.
Thera-Mon-X, Inc.
Trimac Industrial Systems, LLC
Wagner Industrial Solutions

Powder Application Rooms/Clean Rooms/
Environmental Rooms
Carlisle Fluid Technologies
Col-Met Engineered Finishing Solutions
General Fabrications Corporation
George Koch Sons, LLC
Global Finishing Solutions
IntelliFinishing
Midwest Finishing Systems, Inc.
Parker Ionics
Pneu-Mech Systems Mfg.
Powder Coating Consultants, Division of Ninan, Inc.
Richards-Wilcox, Inc.
Rohner
RollSeal, Inc.
SAMES Kremlin

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AkzoNobel Powder Coatings
IFS Coatings
Menphis s.p.a.

Thermoplastics, Polyolefin (PO)
AkzoNobel Powder Coatings
Axalta Coating Systems
IFS Coatings

Thermoplastics, Polypropylene (PP)
AkzoNobel Powder Coatings
IFS Coatings

Thermoplastics, Polyvinylidene Fluoride (PVDF)
AkzoNobel Powder Coatings
IGP North America
PPG Industries

Thermoplastics, Vinyl
AkzoNobel Powder Coatings

Thermoset, Acrylic
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Thermoset, Epoxy
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Cardinal Paint and Powder
Diamond Vogel
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Patriot Powder Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings
Williams-Hayward Protective Coatings, Inc.

Thermoset, Fusion Bonded Epoxy
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Diamond Vogel
IFS Coatings
Patriot Powder Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Thermoset, Hybrids
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Diamond Vogel
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Patriot Powder Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings
Williams-Hayward Protective Coatings, Inc.

Thermoset, Polyesters
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Cardinal Paint and Powder
Diamond Vogel
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Menphis s.p.a.
Patriot Powder Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings
Williams-Hayward Protective Coatings, Inc.

POWDER COATING CHARACTERISTICS

Anti-Graffiti
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Antimicrobial
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Architectural Grade
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Axalta Coating Systems
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Menphis s.p.a.
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Continued on page 32
Conductive
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Electrical Insulating
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

FDA/NSF compliant
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Fluorescents
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

For Heat-Sensitive Substrates (Low Cure)
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Keyland Polymer UV Powder, LLC
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

Hammertones
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
IFS Coatings
IGP North America
Keyland Polymer UV Powder, LLC
PPG Industries
Sherwin-Williams Company
TCI Powder Coatings

High-Reflectance
AkzoNobel Powder Coatings
American Powder Coatings, Inc.
Cardinal Paint and Powder
Erie Powder Coatings, Inc.
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IGP North America
PPG Industries
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- PPG Industries
- TCI Powder Coatings

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- IGP North America
- PPG Industries
- TCI Powder Coatings

### Superdurables
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  - Erie Powder Coatings, Inc.
- IFS Coatings
- IGP North America
- Menphis s.p.a.
- Patriot Powder Coatings
- PPG Industries
- Sherwin-Williams Company
- TCI Powder Coatings

### Textures
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- Diamond Vogel
  - Erie Powder Coatings, Inc.
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- IGP North America
- Keyland Polymer UV Powder, LLC
- Menphis s.p.a.
- Patriot Powder Coatings
- PPG Industries
- Sherwin-Williams Company
- TCI Powder Coatings

### UL-Approved
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- TCI Powder Coatings

### UV-Curable
- AkzoNobel Powder Coatings
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- Sherwin-Williams Company

### Veins
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- Axalta Coating Systems
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- IGP North America
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- TCI Powder Coatings

### Wrinkles
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The Powder Coated Tough staff, along with the Powder Coating Institute’s PCT Subcommittee, worked hard this past year to plan exciting features for our readers. Here are the engaging topics we will tackle in 2020: Improving Your Pretreatment Process, Extreme Coaters, Technology and Today’s Powder Coater, Taking Temperatures to New Highs (and Lows), Bringing Powder Coating In-House.

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CPR Systems
DuBois Chemicals
EnviroServe Chemicals, Inc.
Henkel Corporation
Hubbard-Hall, Inc.
Torch Surface Technologies
Troy Chemical Industries, Inc.

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Calvary Industries, Inc.
Chemetall US, Inc.
Coral Chemical
DuBois Chemicals
Henkel Corporation
Hubbard-Hall, Inc.
Torch Surface Technologies

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Chemetall US, Inc.
Coral Chemical
DuBois Chemicals
EnviroServe Chemicals, Inc.
Henkel Corporation
Hubbard-Hall, Inc.
Torch Surface Technologies
Troy Chemical Industries, Inc.

Conversion Coatings, Zinc Phosphate
BCI Surface Technologies
Calvary Industries, Inc.
Chemetall US, Inc.
DuBois Chemicals
EnviroServe Chemicals, Inc.
Henkel Corporation
Hubbard-Hall, Inc.
Torch Surface Technologies

Conversion Coatings, Iron Phosphate
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Chemetall US, Inc.
CPR Systems
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EnviroServe Chemicals, Inc.
Henkel Corporation
Hubbard-Hall, Inc.
Torch Surface Technologies
Troy Chemical Industries, Inc.

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Torch Surface Technologies
Troy Chemical Industries, Inc.

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- High weather resistance and color retention
- Environmentally responsible
- Available globally

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<thead>
<tr>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>BYK-Gardner USA</td>
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<td>Calvary Industries, Inc.</td>
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<td>Elcometer, Inc.</td>
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<td>Henkel Corporation</td>
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<td>TQC-USA, Inc.</td>
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<td><strong>Adhesion</strong></td>
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<td>Henkel Corporation</td>
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<td>TQC-USA, Inc.</td>
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<td><strong>Color Measuring</strong></td>
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<td>AikenControls</td>
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<td>TQC-USA, Inc.</td>
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<td><strong>Corrosion Resistance</strong></td>
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<td>Henkel Corporation</td>
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<td>TQC-USA, Inc.</td>
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<td><strong>Cure</strong></td>
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<td>Heraeus Noblelight America, LLC</td>
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<td>TQC-USA, Inc.</td>
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<td><strong>Film Thickness Gauges</strong></td>
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<td>SAMES KREMLIN</td>
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<tr>
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<td>TQC-USA, Inc.</td>
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<tr>
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</tr>
<tr>
<td>TQC-USA, Inc.</td>
</tr>
<tr>
<td><strong>Oven Recorders</strong></td>
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<td>Elcometer, Inc.</td>
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<tr>
<td>TQC-USA, Inc.</td>
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<tr>
<td><strong>Particle Size Analyzer</strong></td>
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<tr>
<td>TQC-USA, Inc.</td>
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<tr>
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</tr>
<tr>
<td>Henkel Corporation</td>
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<tr>
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</tr>
<tr>
<td><strong>Salt Spray</strong></td>
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<tr>
<td>DeFelsko Corporation</td>
</tr>
<tr>
<td>Henkel Corporation</td>
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<tr>
<td>TQC-USA, Inc.</td>
</tr>
<tr>
<td><strong>Sieves/Screening Devices</strong></td>
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Dear Joe,

My problem is that a customer wants a white powder paint (very white), and all those that I have applied are too yellowish. Is there a solution?

Thanking you in advance,

Aissa K.
Montreal, QC

Dear Aissa,

Thanks for the question; this is a common problem. Your customer requests a very white powder. While “very white” is a relative term, I think I can still provide some guidelines to allow you to provide the whitest finish for your situation.

First of all, the chemistry of the powder coating affects whiteness. For example, hybrid and especially epoxy type powders have a tendency to yellow upon baking. Powder types less prone to yellowing include polyesters, polyurethanes, and acrylics. Formulating technique also affects the yellowing of these chemistries. The choice of pigment, crosslinker, and additives can significantly influence yellowing resistance. So be sure to evaluate more than one version of these types of powders.

Overbaking (high temperature and/or extended time) exacerbates this problem. Furthermore, the quality of your oven affects whiteness. Gas ovens cause more yellowing than electric or infrared types. Incorrectly adjusted gas/air mixtures will cause more yellowing as well, so it is imperative to keep your oven burner adjusted properly and to avoid overbake conditions. In addition, make sure your oven is properly vented, as accumulation of combustion by-products can cause yellowing.

If your customer requires an extremely highly reflective white powder for an application that involves lighting fixtures, then a specifically formulated powder is required. These products will incorporate special grades of titanium dioxide (white pigment) and quite possibly an optical brightener and antioxidant.

I hope that this helps solve your problem.

Warm regards,

– Joe Powder

Hi Joe,

We currently are being asked to match a powder so we can powder coat steel parts that need to match an anodized aluminum hinge. So far, we have not had much success. Do you feel I’m spinning my wheels trying to match a powder to a plating finish? I’m thinking it’s kind of like the chrome powders that are offered, they call it chrome powder, but it really doesn’t look anything like chrome plating. Would I be better off asking them to powder coat the steel parts and the hinge if they want everything to match?

Thanks in advance for your help.

Jim A.
Oklahoma City, OK

Hi Jim,

Powders can be formulated to approximate the appearance of anodized silver. It won’t be an exact match but will come pretty close. This will be a low gloss metallic effect, and recently powder companies have offered them as a specialty product line. Depending upon the eventual environment that the coating will be exposed to, you may have to apply a low gloss clearcoat for extra durability because the metallic pigments used to create the effect can oxidize in outdoor conditions. The clearcoat will seal the surface and provide significantly improved durability. If this is for an interior application that won’t see much wear and tear, then the clearcoat won’t be necessary.

Best regards,

– Joe Powder
I’d Like a Bamboo Sandwich, Please

Hey Joe,
We build high performance composite skateboards (bamboo sandwiched between fiberglass/epoxy) and we’re looking for 2 things:
1. A non-toxic or low toxicity sealer for the edges and bottom surface of the board.
2. A non-toxic or low toxicity finish to act as a grip surface on the top of the board.
It needs to be flexible, durable, and clear or amber. We currently use a water-based urethane dispersion for both, with a silica aggregate for the grit surface. Any help or thoughts would be appreciated.

Don T.
Culver City, CA

Hey Don,

Powder coatings, which are non-toxic by their nature, can be applied to composites. A number of issues need to be considered with this process. The composite board probably does not have sufficient conductivity to electrostatically spray powder onto its surface. Therefore, a conductive preparation will have to be applied to the board prior to powder coating. I can provide you with a few options if you wish.

The next issue is identifying a powder coating that can be applied and cured at temperatures low enough to avoid distorting the board or causing volatiles to evolve from the composite. Some low-temperature powders can be cured around 250 degrees Fahrenheit for around 20 to 30 minutes. If your composite remains intact under this condition, then I would pursue this option.

If 250 degrees Fahrenheit is too high, then you can consider using UV-curable powder coatings. This technology allows you to process powder coatings in the range of 200 to 250 degrees Fahrenheit. Using these products will require a low temperature melt phase followed by exposing the warm powder surface to intense UV energy. The UV is generated by specially designed lamps that are commercially available. The advantage of the UV process is much lower operating temperatures and a much shorter curing cycle. The melt phase typically takes one to five minutes and the UV step requires a couple seconds. Both the low-temperature cure powder and UV-cure material can be formulated in clear or amber appearance. A grip surface can also be formulated using silica or other inert material.

Good luck,

– Joe Powder

Joe Powder™ is trademarked and owned by Kevin Biller, technical editor for Powder Coated Tough. Please send your questions and comments to Joe Powder™ at askjoepowder@yahoo.com.

Editor’s Note: Letters to and responses from Joe Powder have been edited for space and style.
Data can then be captured and processed by quality control software that can emit alarms and analyze trends.

High Durability Pigments

Formulators now have more choices in high-performance colorant pigments. Shepherd Color has partnered with Oregon State University to bring YInMn (yttrium-indium-manganese) blue to the coatings and allied industries. This dark blue shade of inorganic pigment based on mixed metal oxides has high solar reflectivity, which is conducive to cool surfaces on roofs and other architectural applications. In addition, it has excellent UV durability, chemical resistance and IR properties.

Shepherd Color has also introduced micro-mirror technology based on silver coated glass flakes. These special effect pigments, dubbed StarLight, offer remarkable reflectance and sparkle and are designed for the transportation, architectural, electronics and consumer goods markets.

Antimicrobial

Poly Group, LLC has developed a novel antimicrobial technology based on positively charged compounds that attack and destroy negatively charged pathogens. This technology, named Nouvex™, creates no chemical binding or linking issues, unlike other quaternary ammonium compounds, and has a large molecular structure providing limited toxicity. Nouvex™ has proven performance through licensed laboratory testing, so the EPA preservative and health claims will be accessible to the end-use product manufacturers. This makes Nouvex™ a potential replacement for silver ions, triclosan, copper, and other quaternary substances with little or no process modification.

Processing Technology

Advancements have been made in how powder coatings are manufactured. Specifically, extrusion equipment companies have listened to powder operations managers and have designed feed systems that can accommodate difficult-to-feed premixes and materials. Some powder formulations are based on lightweight, low-density materials and have a tendency to build up in extruder feed ports causing unwanted surging and variable torque. Material builds up in the feed zone and seriously compromises throughput and therefore, processing economics.

Baker Perkins' Max3 feed system is based on a redesigned feed port and screw design which significantly improves the consistent flow of material into the extruder. Pilot plant studies show outputs of difficult-to-feed materials increased as much as 34 percent. This innovative feed system is available on all new machines and as a retrofit option on existing machines ranging from the MPX24 up to MPX80 model.
To make a very long story short, over Frank Lowe’s 60-plus years of existence, we have gained quite a few customers in the powder coating industry without even knowing it. Through market research we found out that we were helping OEMs, fabricators, and custom powder coaters prevent damages during packaging, transportation, and storage of powder coated products. Shortly after, we expanded our research to see how we could efficiently better understand the industry and spread the word. As the old saying goes, all roads lead us to the same path, which in this scenario is the Powder Coating Institute. After several conversations with Leslie Muck to truly understand PCI and what it represents, I’m happy to say that Frank Lowe became a PCI member in December of 2018.

Since then, we have exponentially gained new customers through a variety of PCI’s platforms. One particularly beneficial event was PCI’s Powder Coating 2019 Technical Conference in Orlando, FL. Frank Lowe participated with a tabletop exhibit and I finally had a chance to meet some of the powder coating community and PCI members. Everyone was extremely welcoming and had a plethora of knowledge to share about the powder coating industry. I could not believe the number of attendees that flew in from around the world! Each attendee that stopped by our table expressed interest and provided valuable feedback which has helped us improve our products and processes to best suit the powder coating industry. Needless to say, it was an absolute success and we will surely be back in 2020!

There are also several resources and reports from PCI that I use regularly in order to continuously learn about the powder coating industry. This year’s Executive Director’s report has helped immensely with categorizing each market segment and really focusing my attention on specific coating segments that could be most useful to our company. This report certainly opened my eyes to the variety of coated products that could benefit from protective packaging. From wood finishes to coil finishes and more, PCI members do it all!

I’m truly honored to be a member of such a wonderful community that continues to grow and raise awareness of powder coatings and the benefits it offers towards creating a greener environment. The Powder Coating Institute really has that family feel to it. I very much look forward to being an active member for years to come and to help improve the packaging process of powder coated products worldwide!

Anthony Valerio is in business development for Frank Lowe.
Test your powder coating knowledge interactively with others in our industry and enter for a chance to win a PCI long- or short-sleeved t-shirt!

How it works: We’ve developed questions that test your powder coating knowledge using a copy of Powder Coating: The Complete Finisher’s Handbook. Pop Quiz questions can be found in each issue of PCT.

Put on your thinking cap and then email your answer to popquiz@powdercoatedtough.com using the subject line “Pop Quiz.” All correct answers received by the deadline will be entered in a drawing to win an official PCI long- or short-sleeved t-shirt! In each subsequent issue of the magazine, the correct answer and the lucky winner’s name will be published.

This Issue’s Question:

**Q:** Part hangers can become coated with powder build-up, which reduces its conductivity during subsequent uses. Which of the following is considered a hanger design that can facilitate conductivity, especially for heavier parts?

Choose the correct answer:

A. Barrel edge
B. Razor’s edge
C. Knife edge
D. Rifled edge
E. None of the above

Send your answer for your chance to win! popquiz@powdercoatedtough.com

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Emerging Trends in Powder Coating Technology
by Kevin Biller

On the eve of MMXX, the year which marks the 65th anniversary of the original powder coating patent authored by Erwin Gemmer, we offer a review of the most recent breakthroughs in powder coating technology. Gemmer, if you recall, patented a novel process to coat preheated hand tools with a thick film by dipping them into a fluidized bed of thermoplastic particles. Over the ensuing decades, wise formulators and engineers advanced powder coating technology beyond Gemmer’s wildest dreams to create the thin-film world of thermosetting chemistries possessing remarkable durability, performance and economics.

As requirements for improved performance in extreme working environments have emerged and the ever-present need for exacting process control and reasonable economics continues, technologists have stepped up to the plate to deliver the goods. Functional coatings are being pushed to perform in harsher environments, including more aggressive chemicals and higher operating temperatures. Architects are looking to the powder coating industry for a finish that can withstand 20 to 30 years of sunlight, precipitation and various other environmental attacks. Consumers are demanding more durable finishes on more diverse surfaces. Regulation and public sentiment continue to guide manufacturers toward more environmentally-friendly processes.

In this Buyers Guide edition of Technology Interchange we look at advancements in powder coating technology, equipment, and process improvements that, with all of the aforementioned pressures, continue to answer the call.

Functional Coatings

Functional coatings are typically used in extreme environments where the ultimate in corrosion and chemical resistance are required. Good examples are powders designed to coat pipelines and rebar. Energy companies are accessing crude oil and natural gas in harsher environments and using more aggressive means of extraction. The drilling equipment and corresponding pipelines need to withstand temperatures as high as 177 degrees Celsius (350 degrees Fahrenheit). Conventional functional powders, often described as fusion bonded epoxies because of the manner in which they are applied and cured, can withstand temperatures in the 120 to 135 degrees Celsius (250 to 275 degrees Fahrenheit) range. Recent advances in epoxy resin technology and powder formulating have pushed that boundary.

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Last Issue’s Question:

The question for the September/October edition of Pop Quiz, along with the answer is:

Q: True or False
If you use a powder application room, you should have ample space to store at least 24 hours’ worth of powder supply so the powder can acclimate to the temperature of the room before use.

A: The answer is True. Page 227 of the Handbook recommends acclimating powder to the temperature of the room before use. Powder should be stored on racks and/or in an enclosed closet to prevent cross-contamination of the different materials or colors being sprayed. Also, by having the powder materials stored in an enclosed closet, airborne fibers produced by open cardboard boxes can be isolated from the booth and recovery equipment.

Pop Quiz continues to enjoy great participation. We appreciate all those who took the time to answer!

This month’s winner is:
Chris Bennett
Technical Service Representative
The Sherwin-Williams Company

The t-shirt you selected is on its way.

Congratulations!

Visit www.powdercoating.org/pciwebinars to view archived webinars today.
POWDER COATING WORKSHOPS

Whether you are looking to enhance your own career path or ensure your workforce is trained effectively, PCI hands-on workshops can help you obtain the skills to make better decisions on coating related issues. Taught by the highest quality professionals in the industry, PCI’s training programs will surely give you the competitive advantage you need!

**Powder Coating 101:**
Basic Essentials

The Powder Coating 101 Workshop is an introduction to powder coating recommended for those with little or no knowledge of powder coatings.

**UPCOMING WORKSHOPS**

Orlando, FL - February 17-18  
*Part of Powder Coating Week 2020*

Cleveland, OH - April 21-22

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**Powder Coating 202:**
Optimizing Your Powder Operation

The Powder Coating 202 Workshop is an advanced workshop that focuses on in-depth knowledge of all aspects of the powder coating process. At least three years of industry experience and/or prior attendance at PCI’s Powder Coating 101 Workshop required.

**UPCOMING WORKSHOPS**

Indianapolis, IN - December 3-4

Amherst, OH - March 24-25

FOR MORE INFORMATION, OR TO REGISTER, VISIT [WWW.POWDERCOATING.ORG](http://WWW.POWDERCOATING.ORG) TODAY!

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• How to tackle the generational divide and ensure boomers, millennials and Gen Z “play nice” with each other.
• How to build your company’s reputation as a great place to work.
• Why the focus should be on employees who are doing things well, instead of those who are sucking the life out of a company.

Here are just a few of the things we’ll cover:

• How to create a culture where people want to come to work and stay working.

In a full-employment economy, employees have a choice – do they stay with their current employer or look elsewhere? Employers that understand the importance of attention to detail and the critical role it plays in employee retention are the winners. Focus on what matters and your employees will pay you back! Attend PCI’s Powder Coating 2020 Technical Conference. Review them closely then select your sessions during the registration process. You will be able to switch sessions on-site, but pre-selection of sessions helps immensely in setting each room for the right topics.

Check out a few of the comments from last year’s Technical Conference Attendees:

• “Awesome content; very relevant material.”
• “I learned a lot!”
• “Very well-run conference; clear and concise.”

Read through the wide variety of sessions and presentations available during PCI’s Powder Coating 2020 Technical Conference. Review our keynote and breakout sessions on the following pages and register now!

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Here are some comments from last year's Powder Coating 101 attendees:

• “I’m a newbie, very good info.”
• “I learned a lot in many aspects. Very effective class, happy I attended.”
• “Overall, the workshop has helped me out done.”
• “This has been a great program. I learned a lot, and many of the technical things that need to be done.”

The Forum will feature the following presentations:

- Powder Coating Done Right: The Basics
- Roundtables: Strategies for Growing Your Customer Base
- Creating a Stronger Online Presence
- Improving Quality in Our Industry
- Pocket Guide: What You Need to Know to Get a Job in the Powder Coating Industry
- The Art of Negotiating: Buying/Selling Your Custom Coating Business

PCI’s Powder Coating 101 is a one-and-a-half day workshop that will allow for sharing information. Leaders, hear presentations on timely issues important to their business and participate in discussions designed for custom coaters to network with speakers and other attendees during a reception on day 1 and lunch on day 2.

For more information visit www.powdercoating.org

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<td>734-427-6740</td>
<td>734-427-4630 Fax</td>
<td><a href="http://www.manta.com/c/mm21278/kopacz-industrial-painting-inc">www.manta.com/c/mm21278/kopacz-industrial-painting-inc</a></td>
</tr>
<tr>
<td>KVF - Quad Corp.</td>
<td>808 13th Street</td>
<td>East Moline, IL 61244</td>
<td>800-383-1101</td>
<td>309-755-1121 Fax</td>
<td><a href="http://www.kvfquad.com">www.kvfquad.com</a></td>
</tr>
<tr>
<td>Larsen Powder Coating</td>
<td>930 Turret Court</td>
<td>Mundelein, IL 60060</td>
<td>847-970-9600</td>
<td>847-970-9733 Fax</td>
<td><a href="http://www.larsenmgf.com">www.larsenmgf.com</a></td>
</tr>
<tr>
<td>Link Color NA, Inc.</td>
<td>23 Poplar Street #C</td>
<td>East Rutherford, NJ 07073</td>
<td>201-438-8222</td>
<td>201-438-8863 Fax</td>
<td><a href="http://www.linkolorma.com">www.linkolorma.com</a></td>
</tr>
<tr>
<td>Magic Rack / Production Plus</td>
<td>101 S. Business Place</td>
<td>Ashville, OH 43103</td>
<td>740-983-5178</td>
<td></td>
<td><a href="http://www.magicrack.com">www.magicrack.com</a></td>
</tr>
<tr>
<td>Martin Specialty Coatings, LLC</td>
<td>5015 Flournoy Lucas Road</td>
<td>Shreveport, LA 71129</td>
<td>318-686-2446</td>
<td>318-686-2409 Fax</td>
<td><a href="http://www.martinsc.com">www.martinsc.com</a></td>
</tr>
<tr>
<td>Matrix Coatings Corp.</td>
<td>3575 Investment Lane</td>
<td>West Palm Beach, FL 33404</td>
<td>561-848-1288</td>
<td></td>
<td><a href="http://www.matrixcoat.com">www.matrixcoat.com</a></td>
</tr>
<tr>
<td>Kolene Corporation</td>
<td>12890 Westwood Street</td>
<td>Detroit, MI 48223</td>
<td>313-273-9220</td>
<td>313-273-0251 Fax</td>
<td><a href="http://www.kolene.com">www.kolene.com</a></td>
</tr>
<tr>
<td>Ingersoll corporation</td>
<td>1656 S. Bon View Avenue, Suite F</td>
<td>Ontario, CA 91761</td>
<td>909-947-1122</td>
<td>909-923-7082 Fax</td>
<td><a href="http://www.inlandpowdercoating.com">www.inlandpowdercoating.com</a></td>
</tr>
<tr>
<td>Intech Services, Inc.</td>
<td>211 Lake Drive</td>
<td>Newark, DE 19702</td>
<td>302-366-8530</td>
<td>302-366-8602 Fax</td>
<td><a href="http://www.intechservices.com">www.intechservices.com</a></td>
</tr>
<tr>
<td>Intek Corporation</td>
<td>290 Independence Drive</td>
<td>Union, MO 63056</td>
<td>636-584-8500</td>
<td>636-584-8503 Fax</td>
<td><a href="http://www.intekcorp.com">www.intekcorp.com</a></td>
</tr>
<tr>
<td>Intellifinishing</td>
<td>418 East Avenue B</td>
<td>Salina, KS 67401</td>
<td>785-309-0356</td>
<td>785-825-0590 Fax</td>
<td><a href="http://www.intellifinishing.com">www.intellifinishing.com</a></td>
</tr>
<tr>
<td>IPCO</td>
<td>21 Campus Road</td>
<td>Totowa, NJ 07512</td>
<td>973-476-0953</td>
<td></td>
<td><a href="http://www.ipco.com">www.ipco.com</a></td>
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<td>Newark, DE 19702</td>
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<td>973-476-0953</td>
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<td><a href="http://www.ipco.com">www.ipco.com</a></td>
</tr>
<tr>
<td>Jor-Mac Company, The</td>
<td>155 East Main Street</td>
<td>Lomira, WI 53048</td>
<td>920-269-8500</td>
<td>920-269-2217 Fax</td>
<td><a href="http://www.jor-mac.com">www.jor-mac.com</a></td>
</tr>
<tr>
<td>JIT Powder Coating Company</td>
<td>21020 Eaton Avenue</td>
<td>Farmington, MN 55024</td>
<td>651-463-4664</td>
<td>651-463-4627 Fax</td>
<td><a href="http://www.jitpowdercoating.com">www.jitpowdercoating.com</a></td>
</tr>
<tr>
<td>KCP Metal Fabrications, Inc.</td>
<td>5475 N. Northwest Highway</td>
<td>Chicago, IL 60630</td>
<td>773-775-0318</td>
<td>773-775-6409 Fax</td>
<td><a href="http://www.kcpmetal.com">www.kcpmetal.com</a></td>
</tr>
<tr>
<td>Kelly Group, The</td>
<td>3310 Concord Road</td>
<td>Lafayette, IN 47909</td>
<td>765-474-1800</td>
<td>765-477-0154 Fax</td>
<td><a href="http://www.thekelly-group.com">www.thekelly-group.com</a></td>
</tr>
<tr>
<td>Kettle Moraine Coatings</td>
<td>W208 N16969 Center Street</td>
<td>Jackson, WY 83037</td>
<td>262-677-2291</td>
<td>262-677-4941 Fax</td>
<td><a href="http://www.kettlemorainecoatings.com">www.kettlemorainecoatings.com</a></td>
</tr>
<tr>
<td>Key Tronic Corp.</td>
<td>4424 N. Sullivan Road</td>
<td>Spokane, WA 99216</td>
<td>509-927-5236</td>
<td></td>
<td><a href="http://www.keytronics.com">www.keytronics.com</a></td>
</tr>
<tr>
<td>Keystone Koating, LLC</td>
<td>295 Wood Corner Road</td>
<td>Litch, PA 17543</td>
<td>717-738-2148</td>
<td>717-738-7370 Fax</td>
<td><a href="http://www.keystonekoating.com">www.keystonekoating.com</a></td>
</tr>
<tr>
<td>KeylSteed Coatings</td>
<td>7940 Rodeo Trail</td>
<td>Mansfield, TX 76063</td>
<td>817-247-1211</td>
<td></td>
<td><a href="http://www.keylstedcoatings.com">www.keylstedcoatings.com</a></td>
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<tr>
<td>JIT Powder Coating Company</td>
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<td>Farmington, MN 55024</td>
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<td>651-463-4627 Fax</td>
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<td>920-269-2217 Fax</td>
<td><a href="http://www.jor-mac.com">www.jor-mac.com</a></td>
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<tr>
<td>Company</td>
<td>Address</td>
<td>Phone Numbers</td>
<td>Website</td>
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<tr>
<td>Monarch Industrial Coatings</td>
<td>269 Hespeler Street North, Steinbach, MB R5G 2G8, Canada</td>
<td>204-326-5891, 204-326-5664 Fax</td>
<td><a href="http://www.monarch-coatings.com">www.monarch-coatings.com</a></td>
<td></td>
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<tr>
<td>Motion Laboratories, Inc.</td>
<td>520 Furnace Dock Road, Cortlandt Manor, NY 10567</td>
<td>800-227-6784</td>
<td><a href="http://www.motionlabs.com">www.motionlabs.com</a></td>
<td></td>
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<tr>
<td>Muskogee Powder Coating</td>
<td>#9 Tantalum Place, Muskogee, OK 74403</td>
<td>918-348-4175</td>
<td><a href="http://www.muskogeepowdercoating.com">www.muskogeepowdercoating.com</a></td>
<td></td>
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<tr>
<td>Nautilus Powder Coating</td>
<td>14451 Commerce Center Drive, Moreno Valley, CA 92553</td>
<td>951-842-6260, 951-842-6262 Fax</td>
<td><a href="http://www.nautiluspowdercoating.com">www.nautiluspowdercoating.com</a></td>
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<tr>
<td>Niko Industries</td>
<td>42391 South Airport Road, Hammond, LA 70403</td>
<td>985-318-6456</td>
<td><a href="http://www.nikoindustries.com">www.nikoindustries.com</a></td>
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<tr>
<td>Nix Coatings</td>
<td>129 West Fletchall, Poseyville, IN 47633</td>
<td>812-483-6449</td>
<td><a href="http://www.nixpowderandpaint.com">www.nixpowderandpaint.com</a></td>
<td></td>
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<tr>
<td>Nordson Corporation</td>
<td>100 Nordson Drive, Amherst, OH 44001</td>
<td>440-985-4279</td>
<td><a href="http://www.nordson.com/powder">www.nordson.com/powder</a></td>
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<tr>
<td>North Basin Coating, Inc.</td>
<td>P.O. Box 730, Levelland, TX 79336</td>
<td>806-894-1531, 806-894-8181 Fax</td>
<td><a href="http://www.northbasincoating.com">www.northbasincoating.com</a></td>
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</tr>
</tbody>
</table>

**Question:** Which company offers engineered hanger tooling?

**Answer:** Might Hook, Inc. offers engineered hanger tooling.

**Question:** What is the address for Might Hook, Inc.?

**Answer:** The address for Might Hook, Inc. is 1017 North Cicero Avenue, Chicago, IL 60651-3202.

**Question:** What is the phone number for Might Hook, Inc.?

**Answer:** The phone number for Might Hook, Inc. is 773-378-1909, 773-378-2083 Fax.

**Question:** Who introduces Powder Coating Week?

**Answer:** The Powder Coating Institute introduces Powder Coating Week.

**Question:** When does Powder Coating Week take place?

**Answer:** Powder Coating Week takes place from February 17 – 20, 2020.

**Question:** Where is Powder Coating Week held?

**Answer:** Powder Coating Week is held at the Renaissance Orlando at SeaWorld® in Orlando, FL.

**Question:** What does Powder Coating Week consist of?

**Answer:** Powder Coating Week consists of PCI’s Powder Coating 101 Workshop: The Basics, Custom Coater Forum, Powder Coating Technical Conference & Tabletop Exhibition.

**Question:** How can I get more information about Powder Coating Week?

**Answer:** More information about Powder Coating Week can be found on the website conference.powdercoating.org.
<table>
<thead>
<tr>
<th>Suppliers Directory</th>
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<tbody>
<tr>
<td><strong>PPG Coatings Services</strong></td>
</tr>
<tr>
<td>1340 Neubrecht Road</td>
</tr>
<tr>
<td>Lima, OH 45801</td>
</tr>
<tr>
<td>419-996-7800</td>
</tr>
<tr>
<td>419-996-7801 Fax</td>
</tr>
<tr>
<td><a href="http://www.ppgcoatingsservices.com">www.ppgcoatingsservices.com</a></td>
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<tr>
<td><strong>PPG Industries</strong></td>
</tr>
<tr>
<td>19699 Progress Drive</td>
</tr>
<tr>
<td>Strongsville, OH 44149</td>
</tr>
<tr>
<td>440-572-6196 Fax</td>
</tr>
<tr>
<td><a href="http://www.ppgindustrialcoatings.com">www.ppgindustrialcoatings.com</a></td>
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<tr>
<td><strong>Premier Powder Coating &amp; Custom Fabrication, LLC</strong></td>
</tr>
<tr>
<td>115 N. 2nd W.</td>
</tr>
<tr>
<td>Rexburg, ID 83440</td>
</tr>
<tr>
<td>208-359-5325 Fax</td>
</tr>
<tr>
<td><a href="http://www.ppcfab.com">www.ppcfab.com</a></td>
</tr>
<tr>
<td><strong>Pretreatment Equipment Manufacturing, Inc. (P.E.M., Inc.)</strong></td>
</tr>
<tr>
<td>320 Mallard Lane</td>
</tr>
<tr>
<td>Mankato, MN 56001</td>
</tr>
<tr>
<td>507-345-1512 Fax</td>
</tr>
<tr>
<td><a href="http://www.spraywand.com">www.spraywand.com</a></td>
</tr>
<tr>
<td><strong>Prime Restoration</strong></td>
</tr>
<tr>
<td>349 East Brooks Road</td>
</tr>
<tr>
<td>Memphis, TN 38109</td>
</tr>
<tr>
<td>901-346-1450 Fax</td>
</tr>
<tr>
<td><a href="http://www.primerestore.com">www.primerestore.com</a></td>
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<tr>
<td><strong>Pro Powder Coating, Inc.</strong></td>
</tr>
<tr>
<td>5474 Williamsburg Drive</td>
</tr>
<tr>
<td>Punta Gorda, FL 33982</td>
</tr>
<tr>
<td>941-740-4309 Fax</td>
</tr>
<tr>
<td><a href="http://www.propowdercoat.com">www.propowdercoat.com</a></td>
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<tr>
<td><strong>Pro Powder, Inc.</strong></td>
</tr>
<tr>
<td>201 Lovejoy Street</td>
</tr>
<tr>
<td>South Haven, MI 49090</td>
</tr>
<tr>
<td>269-637-8722 Fax</td>
</tr>
<tr>
<td><a href="http://www.powderhousecoatings.com">www.powderhousecoatings.com</a></td>
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<tr>
<td><strong>Powder Coating Research Group, Inc.</strong></td>
</tr>
<tr>
<td>1823 O’Brien Road</td>
</tr>
<tr>
<td>Columbus, OH 43228</td>
</tr>
<tr>
<td>888-345-1198 Fax</td>
</tr>
<tr>
<td><a href="http://www.powdercoatingresearch.com">www.powdercoatingresearch.com</a></td>
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<tr>
<td><strong>Powder Coating Specialties, Inc.</strong></td>
</tr>
<tr>
<td>11027 Timber Crest Drive</td>
</tr>
<tr>
<td>Houston, TX 77065</td>
</tr>
<tr>
<td>281-653-9585 Fax</td>
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<td><a href="http://www.powderhousecoatings.com">www.powderhousecoatings.com</a></td>
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<tr>
<td><strong>Powder Coatings of Utah</strong></td>
</tr>
<tr>
<td>2951 South Pennsylvania Avenue</td>
</tr>
<tr>
<td>Ogden, UT 84401</td>
</tr>
<tr>
<td>801-866-1300 Fax</td>
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<td><a href="http://www.powdercoatingspecialties.com">www.powdercoatingspecialties.com</a></td>
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<tr>
<td><strong>Powder Fresh Coatings, LLC</strong></td>
</tr>
<tr>
<td>P.O. Box 12345</td>
</tr>
<tr>
<td>City, State 34567</td>
</tr>
<tr>
<td>703-123-4567 Fax</td>
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<td><a href="http://www.powderfreshcoatings.com">www.powderfreshcoatings.com</a></td>
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<tr>
<td><strong>Pneu-Mech Systems Mfg.</strong></td>
</tr>
<tr>
<td>201 Pneu-Mech Drive</td>
</tr>
<tr>
<td>Statesville, NC 28675</td>
</tr>
<tr>
<td>800-274-5724 Fax</td>
</tr>
<tr>
<td><a href="http://www.pneumech.com">www.pneumech.com</a></td>
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<tr>
<td><strong>Pollution Control Products</strong></td>
</tr>
<tr>
<td>2677 Freeman Drive</td>
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<tr>
<td>Dallas, TX 75220</td>
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<tr>
<td>214-358-1539 Fax</td>
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<tr>
<td><a href="http://www.pcpconline.com">www.pcpconline.com</a></td>
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<tr>
<td><strong>Powder Coating Consultants, Division of Ninan, Inc.</strong></td>
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<tr>
<td>13453 Villa Di Preserve Lane</td>
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<tr>
<td>Estero, FL 33928</td>
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<tr>
<td>203-366-7244 Fax</td>
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<td><a href="http://www.powdercc.com">www.powdercc.com</a></td>
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<tr>
<td><strong>Patriot Powder Coatings</strong></td>
</tr>
<tr>
<td>191 Buckingham Place Road</td>
</tr>
<tr>
<td>Mooresville, NC 28115-9177</td>
</tr>
<tr>
<td>704-949-2526 Fax</td>
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<td><a href="http://www.patriotpowder.com">www.patriotpowder.com</a></td>
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<tr>
<td><strong>Parker Ionics</strong></td>
</tr>
<tr>
<td>38147 Abruzzi Drive</td>
</tr>
<tr>
<td>Westland, MI 48185</td>
</tr>
<tr>
<td>734-326-7630 Fax</td>
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<td><a href="http://www.parkerionics.com">www.parkerionics.com</a></td>
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<tr>
<td><strong>Performance Powder, Inc.</strong></td>
</tr>
<tr>
<td>2920 E. La Jolla Street</td>
</tr>
<tr>
<td>Anaheim, CA 92806</td>
</tr>
<tr>
<td>714-632-0600 Fax</td>
</tr>
<tr>
<td><a href="http://www.performancepowder.net">www.performancepowder.net</a></td>
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<tr>
<td><strong>PJ’s Fabricating, Inc.</strong></td>
</tr>
<tr>
<td>1511 Linwood Avenue, SW</td>
</tr>
<tr>
<td>Canton, OH 44710</td>
</tr>
<tr>
<td>330-478-2507 Fax</td>
</tr>
<tr>
<td><a href="http://www.pjsfab.com">www.pjsfab.com</a></td>
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<tr>
<td><strong>Plastisol Products, Inc.</strong></td>
</tr>
<tr>
<td>1002 Republic Drive</td>
</tr>
<tr>
<td>Addison, IL 60101</td>
</tr>
<tr>
<td>630-543-1770 Fax</td>
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<tr>
<td><a href="http://www.plastisolproducts.com">www.plastisolproducts.com</a></td>
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Northwest Powder Coatings, Inc.
1400 S. 192nd Street
Seattle, WA 98148
206-241-1614
206-242-7514 Fax
www.manta.com/c/mmlts3j/northwest-powder-coatings-inc

Pacific Powder Coating, Inc.
8637 23rd Avenue
Sacramento, CA 95826
916-381-1154
916-381-2811 Fax
www.pacpowder.com

Parker Ionics
38147 Abruzzi Drive
Westland, MI 48185
734-326-7630
734-326-7638 Fax
www.parkerionics.com

Patriot Powder Coatings
191 Buckingham Place Road
Mooresville, NC 28115-9177
704-949-2526
315-589-7621 Fax
www.patriotpowder.com

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714-632-0600
www.performancepowder.net

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330-478-8610 Fax
www.pjsfab.com

Plastisol Products, Inc.
1002 Republic Drive
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630-543-1770
630-543-1774 Fax
www.plastisolproducts.com

Pneu-Mech Systems Mfg.
201 Pneu-Mech Drive
Statesville, NC 28625
800-274-5724
704-871-2780 Fax
www.pneu-mech.com

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214-358-3379 Fax
www.pcpconline.com

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866-294-8552 Fax
www.powdercoatingresearch.com

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Golden, CO 80401
877-674-6418
303-279-6852 Fax
www.powdercoatingspecialties.com

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2951 South Pennsylvania Avenue
Ogden, UT 84401
801-866-1300
801-866-1302 Fax
www.powdercoatingsofutah.com

Powder House Coatings
11027 Timber Crest Drive
Houston, TX 77065
281-653-9585
www.powderhousecoatings.com

Powderfresh Coatings, LLC
P.O. Box 2761
Peachtree City, GA 30269
678-953-1322

PPG Coatings Services
1340 Neubrecht Road
Lima, OH 45801
419-996-7800
419-996-7801 Fax
www.ppgcoatingsservices.com

PPG Industries
19699 Progress Drive
Strongsville, OH 44149
440-572-6196
440-572-0848 Fax
www.ppgindustrialcoatings.com

Premier Powder Coating & Custom Fabrication, LLC
115 N. 2nd W.
Rexburg, ID 83440
208-359-5325 Fax
www.ppcfab.com

Pretreatment Equipment Manufacturing, Inc. (P.E.M., Inc.)
320 Mallard Lane
Mankato, MN 56001
507-345-1512
507-345-5828 Fax
www.spraywand.com

Prime Restoration
349 East Brooks Road
Memphis, TN 38109
901-346-1450
901-324-3096 Fax
www.primerestore.com

Pro Powder Coating, Inc.
5474 Williamsburg Drive
Punta Gorda, FL 33982
941-740-4309
www.propowdercoat.com

Pro Powder, Inc.
201 Lovejoy Street
South Haven, MI 49090
269-637-8722
269-637-3482 Fax
www.powdercoatingspecialties.com

Products Finishing (Gardner)
6915 Valley Avenue
Cincinnati, OH 45244
800-950-8020
513-527-8801 Fax
www.pfonline.com

PROEM Solutions, LLC
P.O. Box 850624
Yukon, OK 73085
405-628-3226
www.proem-sol.com

Plastisol Products, Inc.
1002 Republic Drive
Addison, IL 60101
630-543-1770
630-543-1774 Fax
www.plastisolproducts.com
Progressive Coating
900 South Cicero Avenue
Chicago, IL 60644
773-261-8900
773-261-8902 Fax
www.progressive-coating.com

Pro-Kote, LLC
76 Harts Bridge Road West
Jackson, TN 38301
731-422-9019
731-422-6459 Fax
www.prokotellc.com

PS Powder Coating
58500 McNulty Way
Saint Helens, OR 97051
503-397-1277
www.psppowdercoating.com

Qualicoat, Inc.
14 Sanford Road North
Churchville, NY 14428
585-293-2650
www.qualicoat.com

Qualities of Linings and Painting, Inc.
8250 East 40th Avenue
Denver, CO 80207
303-307-1313
www.qualapi.com

Quality Product Finishing, Inc.
9610 Fairbanks N. Houston Road
Houston, TX 77064
800-644-0432
281-890-5482 Fax
www.qpfinishing.com

Quality Works of Southwest Louisiana, LLC
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Lake Charles, LA 70615
337-564-6922
337-564-6932 Fax
www.qualityworksla.com

R & R Powder Coating, Inc.
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Dallas, NC 28034
704-853-0727
704-853-0744 Fax
www.rrpowdercoating.com

RayPaul Coating, Inc.
P.O. Box 965042
Marietta, GA 30066
770-926-3185
770-591-6218 Fax
www.raypaulcoating.com

Richards-Wilcox, Inc.
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Aurora, IL 60506
888-852-1020
630-966-7515 Fax
www.richardswilcox.com

Rocket Powder Coating
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P.O. Box 397
Centuria, WI 54824
715-640-2424
715-640-2426 Fax
www.rocketpowdercoat.com

Rohner
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Vancouver, WA 98682
360-885-7641
360-896-5748 Fax
www.rohner-usa.com

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Bremen, AL 35033
256-287-7000
256-287-7010 Fax
www.rollseal.net

Rugged Werx
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307-858-0203
www.ruggedwerx.com

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630-855-8018 Fax
www.sames-kremlin.com

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Charleston, SC 29492
843-999-0750
www.sapienceautomation.com

Sewah Studios
190 Millcreek Road
Marietta, OH 45750
740-373-2087
740-373-2087 Fax
www.sewahstudios.com

Sherwin-Williams Company
1101 South Third Street
Minneapolis, MN 55415
612-268-8420
www.sherwin-williams.com

Silverback Custom Coating
1402 W. Jackson
El Campo, TX 77437
979-330-6129
www.silverbackcustomcoating.com

Silverline Finishing, Inc.
9501 W. 900 S.
Ogden, UT 84401
801-690-7159
www.silverlinefinishing.com

SJS Industrial
2401 Bowland Parkway
Suite 103
Virginia Beach, VA 23454
757-320-2368 Fax
www.sjsindustrial.net

Skagit Powder Coating
14805 Jackpot Lane
Mount Vernon, WA 98273
360-848-8916 Fax
www.skagitpowdercoating.com

Slocum Equipment, Inc.
3528 Quaker Lane
North Kingstown, RI 02852
401-294-0001
401-294-0010 Fax
www.slocumequipment.com

Smith Powder Coating
280 W. 500 S.
Spanish Fork, UT 84660
801-414-1724
www.smithpowdercoating.com
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
<th>Website</th>
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<tr>
<td>Southern Fluid Systems</td>
<td>P.O. Box 44786, 880 Great Southwest Pkwy SW, Atlanta, GA 30336</td>
<td>404-352-2688</td>
<td>404-355-0660 Fax</td>
<td><a href="http://www.southernfluidsystems.com">www.southernfluidsystems.com</a></td>
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<td>Spectrum Metal Finishing, Inc.</td>
<td>535 Bev Road, Youngstown, OH 44512</td>
<td>330-758-8358</td>
<td>330-758-8350 Fax</td>
<td><a href="http://www.spectrummetal.com">www.spectrummetal.com</a></td>
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<td>Star Finishes, Inc.</td>
<td>40429 Brickyard Drive, Madera, CA 93636</td>
<td>559-261-1076</td>
<td>559-261-1064 Fax</td>
<td><a href="http://www.starfinishes.com">www.starfinishes.com</a></td>
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<td>Stepan Company</td>
<td>22 W. Frontage Road, Northfield, IL 60093</td>
<td>847-446-7500</td>
<td>847-441-1466 Fax</td>
<td><a href="http://www.stepan.com">www.stepan.com</a></td>
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<td>Structural Coatings, LLC</td>
<td>1355 So. Huron Street, Denver, CO 80223</td>
<td>303-765-0772</td>
<td>303-765-0807 Fax</td>
<td><a href="http://www.structuralcoatingsco.com">www.structuralcoatingsco.com</a></td>
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<td>Sumitomo Corporation of Americas</td>
<td>300 Madison Avenue, New York, NY 10017-9096</td>
<td>212-207-0377</td>
<td>212-207-0826 Fax</td>
<td><a href="http://www.sumitomocorp.com">www.sumitomocorp.com</a></td>
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<td>Sun Polymers International, Inc.</td>
<td>100 Sun Polymers Drive, Mooresville, IN 46158</td>
<td>800-877-41RESIN</td>
<td>317-834-6411 Fax</td>
<td><a href="http://www.sunpolymers.com">www.sunpolymers.com</a></td>
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<td>Surtech Industries</td>
<td>915 Borom Road, York, PA 17404</td>
<td>717-767-6808</td>
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<td><a href="http://www.surtech-ind.com">www.surtech-ind.com</a></td>
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<td>Torch Surface Technologies</td>
<td>10781 Plaza Drive, Whitmore Lake, MI 48189</td>
<td>734-449-9500</td>
<td>734-449-9510 Fax</td>
<td><a href="http://www.torchsurfaketech.com">www.torchsurfaketech.com</a></td>
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<td>TQC-USA, Inc.</td>
<td>3689 Hadley Road, Metamora, MI 48455</td>
<td>248-202-3969</td>
<td>810-678-2422 Fax</td>
<td><a href="http://www.tqc-usa.com">www.tqc-usa.com</a></td>
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<td>Trimac Industrial Systems, LLC</td>
<td>12601 Kaw Drive, Bonner Springs, KS 66012</td>
<td>913-441-0043</td>
<td>913-422-2004 Fax</td>
<td><a href="http://www.trimacsystems.com">www.trimacsystems.com</a></td>
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<td>Troy Chemical Industries, Inc.</td>
<td>17040 Rapids Road, P.O. Box 430, Burton, OH 44021</td>
<td>440-834-4408</td>
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<td><a href="http://www.troychemical.com">www.troychemical.com</a></td>
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<td>Troy Corporation</td>
<td>8 Veeeland Road, Florham Park, NJ 07932</td>
<td>973-443-4200 Fax</td>
<td>973-3359</td>
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<td>Tru-Line Manufacturing</td>
<td>3510 Central Parkway, S.W. Decatur, AL 35603</td>
<td>256-350-1002</td>
<td>256-350-3315 Fax</td>
<td><a href="http://www.trulinemfg.com">www.trulinemfg.com</a></td>
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<td>Uni-Spray Systems, Inc.</td>
<td>44 Durward Place, Waterloo, ON N2L 4E4 Canada</td>
<td>877-236-0204</td>
<td>519-885-4325 Fax</td>
<td><a href="http://www.uni-spray.com">www.uni-spray.com</a></td>
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<td>Valmont Coatings-Applied Coating Technology</td>
<td>2411 Pilot Knob Road, Mendota Heights, MN 55120</td>
<td>651-454-7777</td>
<td>651-454-6132 Fax</td>
<td><a href="http://www.appliedcoating.com">www.appliedcoating.com</a></td>
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<td>American Powder Coatings</td>
<td>630-762-0100</td>
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<td>919-469-6837</td>
<td><a href="http://www.arkemacoatingresins.com">www.arkemacoatingresins.com</a></td>
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<td>Axalta Coating Systems</td>
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<td>Chemetall US, Inc.</td>
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<td>Col-Met Engineered Finishing Solutions</td>
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<td>29</td>
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<td>800-448-3835</td>
<td><a href="http://www.defelsko.com">www.defelsko.com</a></td>
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<td>Diamond Vogel</td>
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<td>Echo Engineering and Production Supply, Inc.</td>
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<td>Fischer Technology, Inc.</td>
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<td>51</td>
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<td>Gema USA</td>
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<td><a href="http://www.gemapowdercoating.com">www.gemapowdercoating.com</a></td>
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<td>General Fabrications Corporation</td>
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<td>George Koch Sons, LLC</td>
<td>888-873-5624</td>
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<td>Global Finishing Solutions</td>
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<td>Hubbard-Hall, Inc.</td>
<td>866-441-5831</td>
<td><a href="http://www.hubbardhall.com">www.hubbardhall.com</a></td>
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<td>Midwest Finishing Systems, Inc.</td>
<td>888-281-0099</td>
<td><a href="http://www.midwestfinishing.com">www.midwestfinishing.com</a></td>
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<td>Nordson Corporation</td>
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<td>Parker Ionics</td>
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<td><a href="http://www.parkerionics.com">www.parkerionics.com</a></td>
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<td></td>
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<td>Powder Coating Institute, The</td>
<td>800-988-COAT</td>
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<td>Quaker Houghton</td>
<td>610-832-4000</td>
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