Most of the anodizing job shops use direct current (DC) for Type II anodizing. This article will talk about slow pulses using low frequency pulse, which gives pulses in seconds to minutes as accounted for in the early eighties by Yokoyama, Konno and Takahashi.1

Before going into depth with the square wave formed pulse anodizing a short introduction of anodizing and the formation of the oxide layer is necessary.

Anodizing takes place when a certain current is applied to aluminum as the anode in an electrolyte, the oxidation will start. This current will pass through the electrolyte and the aluminum oxide, Al2O3, will form at the aluminum surface. When the electrolyte consists of an acid, e.g. sulfuric acid, dissolution of the aluminum oxide will take place. Hereby a porous oxide layer is formed. It is important to realize that the growth takes place at the bottom of the pores. Therefore the outer part of the oxide layer has been formed first and the acid during anodizing may have noticeably attacked it.

The two main reactions involved when forming porous aluminum oxide is a formation and a dissolution, which should be kept at a steady state to form an optimal porous oxide film.

\[
2\text{Al} + 3\text{H}_2\text{O} \rightarrow \text{Al}_2\text{O}_3 + 6\text{H}^+ + 6\text{e} \\
\text{Al}_2\text{O}_3 + 6\text{H}^+ \rightarrow 2\text{Al}^3+ + 3\text{H}_2\text{O}
\]

The last one is the chemical dissolution of the formed oxide layer. It would be very difficult to explain how the chemical dissolution should be able to double for the...
INDUSTRY EVENTS AROUND THE WORLD

Jan 25-26, 2010
ISFA Intro to Anodizing Course
Phoenix, AZ
www.surfacefinishingacademy.com

January 31 - February 2, 2010
Aluminum Symposium 2010
Marco Island, FL

February 7-10, 2010
PACE 2010
Phoenix, AZ
www.pace2010.com

February 10-12, 2010
The Waterborne Symposium
New Orleans, LA
www.psrc.usm.edu/waterborne

February 17-18, 2010
MFASC & NC Vendor Showcase
San Jose, CA
www.mfancc.org

February 17-18, 2010
ISFA Intro to Anodizing Course
San Jose, CA
www.surfacefinishingacademy.com

February 17-18, 2010
Advanced Powder Coating Workshop
San Jose, CA
www.surfacefinishingacademy.com

February 17-18, 2010
5th Annual Metal Matters
Lake Buena Vista, FL
www.fma.org

February 17-18, 2010
17th Aluminum Trends Conference
Coral Gables, FL
www.naaluminumtrends.com

February 17-18, 2010
Corrosion 2010 Conference & Expo
San Antonio, TX
www.nace.org

February 17-18, 2010
Int'l. Electro-Plating Expo
Guangdong, China
www.worldtradeexpo.com.hk

February 17-18, 2010
Introduction to Powder Coating Course
Pensacola, FL
www.surfacefinishingacademy.com

March 3-5, 2010
WESTEC
Los Angeles Convention Center
www.westeconline.com/

March 3-5, 2010
Shot Peen & Blasting Workshop
Houston, TX
www.mfn.li

March 8-10, 2010
American Coatings Show & Conference
Charlotte, NC, USA
www.american-coatings-show.com

March 14-18, 2010
PaintExpo International Trade Fair
Karlsruhe, Germany
www.paintexpo.de

March 23-25, 2010
Process Cleaning Expo 2010
Louisville, KY
www.processcleaning.com

March 23-25, 2010
Introduction to Powder Coating Course
San Jose, CA
www.surfacefinishingacademy.com

March 3-5, 2010
PACE 2010
Phoenix, AZ
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March 8-10, 2010
The Waterborne Symposium
New Orleans, LA
www.psrc.usm.edu/waterborne

March 14-18, 2010
Corrosion 2010 Conference & Expo
San Antonio, TX
www.nace.org

March 17-20, 2010
Int'l. Electro-Plating Expo
Guangdong, China
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Los Angeles Convention Center
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March 23-25, 2010
ISFA Intro to Anodizing Course
San Jose, CA
www.surfacefinishingacademy.com

April 12-15, 2010
17th Aluminum Trends Conference
Coral Gables, FL
www.naaluminumtrends.com

April 13-16, 2010
PaintExpo International Trade Fair
Karlsruhe, Germany
www.paintexpo.de

April 13-16, 2010
American Coatings Show & Conference
Charlotte, NC, USA
www.american-coatings-show.com

April 19-23, 2010
Hannover Messe 2010
Hannover, Germany
www.hannovermesse.de

May 4-6, 2010
Process Cleaning Expo 2010
Louisville, KY
www.processcleaning.com

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May 4-6, 2010
Electrocoat 2010
Louisville, KY Convention Center
www.electrocoat.org

May 11-12, 2010
ISFA Intro to Anodizing Course
Chicago, IL
www.surfacefinishingacademy.com

May 25-26, 2010
Introduction to Powder Coating Course
St. Louis, MO
www.surfacefinishingacademy.com

June 8-10, 2010
Intl Trade Fair for Surface Treatments
Stuttgart, Germany
www.cms.messe-stuttgart.de

June 10-11, 2010
SUR-FAIR Aerospace Finishing Expo
Biarritz, France
www.surfair-congres.com

June 12-15, 2010
34th Conference of Precious Metals
Tucson, AZ
www.ipmi.org

June 15-16, 2010
Sur-Fin 2010
Grand Rapids, MI
www.nasf.org

June 22-23, 2010
Introduction to Powder Coating Course
Pittsburg, PA
www.surfacefinishingacademy.com

June 26-29, 2010
CCAI 2010 Annual Meeting
Sarasota, FL
www.ccaiweb.com

August 17-18, 2010
Introduction to Powder Coating Course
San Diego, CA
www.surfacefinishingacademy.com

August 17-18, 2010
ISFA Intro to Anodizing Course
San Diego, CA
www.surfacefinishingacademy.com

August 17-18, 2010
Advanced Powder Coating Workshop
San Diego, CA
www.surfacefinishingacademy.com
FINISHING TALK FROM AROUND THE WORLD

Rutherfordton, NC The Surface Finishing Academy has announced cities and dates of their new courses and workshops to be held around the US in 2010. Courses already scheduled for the year include Introduction to Powder Coating, Advanced Powder Coating, Introduction to Anodizing, and Process Cleaning. Advance registration for these courses is now open. “We are very excited about our expanded North American schedule of training opportunities in 2010, and look forward to adding several international dates in the near future as well,” said Paul Fisher, Director of the Academy.

Oshkosh, WI The Oshkosh Corp. recently announced that the U.S. Army ordered another 1,000 all-terrain vehicles that feature mine resistant ambush protection, which is the 5th such award, bringing to total M-ATV’s to be delivered to over 6,200. According to the AP the order is worth another $438 million.

Naugatuck, CT Reliable Silver Corporation, which fabricates precious metals for industrial, decorative and investment applications, has established a new pricing approach that includes eliminating waste that could increase productivity and lower overall cost. The novel pricing approach addresses the financial impact of job components throughout the process from materials planning, inventory management, ordering, timely deliveries, production and payment.

Williamsburg, KY Global Green Cars announces plans to build their new electric car plant in KY. Green Cars plans completing the transition from Idaho to Kentucky by the end of 2009, with the hopes of producing first stage vehicles in 2010 in a temporary facility while building an new state of the art facility capable of producing 30,000 electric cars and trucks per by 2011 to meet anticipated demand.

Belvidere, IL Chrysler will add a temporary shift starting Nov. 17, filling as many as 1000 jobs in order to increase production of the Dodge Caliber. This new temporary shift will add significantly to the 1,700 workers already employed at the Belvidere facility. Max Gates, company spokesman said the hiring would have happened even sooner if it were not for supplier shortages.

Tewksbury, MA Raytheon Co. recently announced that it has been awarded a contract worth $26.9 million to provide technical assistance to Taiwan’s missile defense system. The award represents a modification to a technical assistance contract granted in 2008. Raytheon will provide field engineers to refurbish Taiwan’s Patriot equipment and will extend the services of current advisers assisting with training, operational planning and sustainment of Patriot systems.

Indianapolis, IN Benchmark Products has merged with New Surface Technologies (NST) of Bedford, OH and will move its headquarters to their Indianapolis office on West 84th Street. The combined company will be renamed Asterion LLC. It was reported by the Indianapolis Business Journal that the stocks and assets that were exchanged in the merger, did not involved cash, and were valued at $3 million. The merger takes effect on Dec. 1. Roger Sowinski will join the new company as senior vice president and chief technology officer.

Ladson, SC Boeing picked Ladson for its second 787 Dreamliner production line The move “will expand our production capability to meet the market demand for the airplane,” Jim Albaugh, president and chief executive of Boeing Commercial Airplanes. “This decision allows us to continue building on the synergies we have established in South Carolina with Boeing Charleston and Global Aeronautica,” he said, the latter being a company 50% owned by Boeing. Boeing’s South Carolina plant already assembles and installs parts of the 787 fuselage sections.

Wauconda, IL The AAC, an international trade association of firms engaged in aluminum anodizing and whose mission is to support its members through education and advocacy has recognized two exception volunteers with their awards of Excellence. First, Jude M. Runge, PhD was presented with the Council’s Outstanding Achievement Award for “consistently [delivering] on the promise of excellence,” as stated by AAC Chairman Terry Snell. Followed by Richard Mahn, of Houghton Metal Finishing who was presented with the Steadfast Service Award. “Richard has [exhibited] extraordinary fidelity to the industry—and the Council—reliably, over his whole career,” commented Snell.

Washington, DC According to the Ocean Renewable Energy Coalition (OREC) the United States Congress approved a $50 million package for water power research, development and deployment of marine and hydrokinetic energy technologies.

OBITUARY

Westlake, OH Patrick J. Brennan, 60, Vice President of Q-Lab Corporation, died September 20, 2009. During his 30-year Q-Lab career, he became established as one of the few experts in the field of accelerated weathering and lightfastness. He was an active member of ASTM, ISO, AATCC standards making organizations. An ASTM member since 1986, Brennan participated in committees on metallic coatings B08, sealants C24, paint and coatings D01, corrosion G01 and weathering G03, and more than 50 subcommittees. Brennan was also an active member of AATCC for 23 years.

~FT
Wackersdorf, Germany Benteler Automobiltechnik, GmbH has signed an agreement with Norsk Hydro ASA for the acquisition of Hydro's automotive structures business, which produces bumpers and crash management systems. The automotive structures business has about 1,200 employees. The sale is expected to close on 31 December 2009.

Jiangsu, China PPG recently broke ground for a new resin plant in China. The facility will be their first resin production facility in mainland China and will be located at the Zhangjiagang Yangtze International Chemical Industrial Park. The plant will supply other PPG plants throughout China, as well as automotive and industrial customers primarily with water-based electrodeposition resins for use in automotive and general industrial coatings. The plant will span 60,000 square meters, and initial production capacity will be 27,000 metric tons. The plant is scheduled to begin operation in early 2011.

Comines, France Holliday Pigments has invested €2M in an effluent treatment plant (ETP) at its main manufacturing site in Comines, Northern France. Following the €7.5M implementation of a flue gas desulphurization (FGD) plant in 2004, the site is now the world’s largest ultramarine manufacturing plant complying with all European environmental laws. The European Union has pledged a 10 year loan of €1.19M and converted €225,000 of this amount into a grant as part of an ongoing technical and financial partnership.

London, UK Rolls-Royce Group, PLC has won an $8.5 million contract with the Air Force. A company spokes man recently said that the U.S. Air Force has awarded its Indianapolis operations the contract to provide spare engine parts for the C-130J military transport aircraft. The agreement follows a similar contract in May, in which Rolls-Royce received $80 million to provide spare engines and parts for the C-130 flown by the Air Force, Marine Corps, Royal Norwegian Air Force and Indian Air Force. Rolls-Royce is part of London-based Rolls-Royce Group PLC, is the region's second-largest manufacturer and has about 4,300 local employees.

Pune, India Reichhold, an RTP based manufacturer of unsaturated polyester resins, recently opened a new manufacturing facility in Pune for manufacturing unsaturated polyester resins for wind turbine, glass-reinforced pipe, engineering stone, chemical equipment, automobile and general-purpose sectors. The site is just one of 19 Reichhold manufacturing facilities and four technology centers around the world. “As the leading global player in composite resins, we want to be part of India’s growth by bringing international quality products to match local needs,” said John Gaither, chairman, president and CEO of Reichhold Industries Inc. “With this plant in India, we will further strengthen our offerings to the global market.”

Manama, Bahrain Dow Corning has established a Middle East headquarters in Manama, Bahrain. “The Middle East is growing rapidly and quickly diversifying its business footprint,” said Stephanie Burns, Dow Corning's CEO. “We recognize the region's growing impact on the global economy and are now better-positioned to share the benefits of Dow Corning’s silicon-based materials and technology to help the region continue to grow and compete in the global economy over the long-term.” The company has been actively seeking collaboration opportunities in the region for many years, and its silicone construction materials are being used in the construction of the world’s tallest building, the Burj Dubai in Dubai, United Arab Emirates.

Belfast, Northern Ireland Vulcanium Metals International announced a new titanium facility. The facility, located near Belfast in Northern Ireland, will be equipped and staffed to be a state-of-the-art titanium stocking centre which will also provide FirstCut+® services. Commenting on the new facility, Jerry St. Clair, President of Vulcanium said, “We are creating a 'Titanium Center of Excellence' to better serve our global partners. We are reshaping the landscape of the titanium industry by changing expectations in service and value.” The Northern Ireland facility will support Vulcanium’s business development managers located in the UK—Harvey Pitcher, Michael O’Prey and Richard Leeson, in serving aerospace, medical device and industrial markets across Europe.

Baden-Württemberg, Germany MetoKote Corp. has chosen Germany as the site for its new manufacturing plant, and recently broke ground on the new facility in Mannheim, Baden-Württemberg. The new investment of $9.7 million, will also serve as a pilot project focused on reaching further customers in continental Europe, and is MetoKote’s first office in Germany. The 11,500-square-meter site will include a production facility, will eventually employ 50 workers at the by the time production ramps up in July 2010. "We are very much looking forward to producing in Germany," said DeWayne Pinkstaff, president and CEO, who attended the groundbreaking ceremony. “The site is optimal for us, as it is located in the Rhine-Neckar metropolitan area, one of the most dynamic areas in Europe. The region provides us with an excellent opportunity to reach new customers.”
FINISHING TALK WALK
ADVANCED COLOUR COATINGS, BIRMINGHAM ENGLAND

It may sound a bit cliché, but it all started on Facebook. It was my last morning attending the Surface World Show in Birmingham England when I received a message from Mo Bashir, the Operations Manager of Advanced Colour Coatings. He asked if I wanted to “see a well-run powder coating shop” How could I pass up an offer for a formal Finishing Talk walk through this local powder and paint shop, after my thoroughly informative expedition at Surface World. Too bad Skelton couldn’t join me on this one.

I met Mo and Kevin Mann, the owner of Advanced Colour Coatings, on the show floor for a chat and a quick cup of coffee. One thing I couldn’t get out of my head was the fact that these guys contacted me. This doesn’t happen often, even for the bigger publications in our industry. It didn’t take long to realize that ACC operates differently than all of the other shops I’ve dealt with.

I tried to envision the situation reversed...imagine a British metal finishing publication showed up at Sur/Fin or a Powder Coating Institute show in Indy. Do you think any of the job shops in the area would invite them for a tour of their facility? I don’t think so. It seems people in the US are usually not that open-minded and proactive in their efforts to tell their story.

ACC’s operation is the most impressive that I’ve ever visited in my career. I’ve never seen such attention to detail in any of the thousands of job shops I’ve observed in the past ten years. It is no surprise that Daimler calls ACC one of their best powder coaters. First of all, these guys approached me and asked me to come take a walk through their facility, then rolled out the red carpet. They went out of their way to explain how they were different, and then...
followed through with showing me firsthand how they were different. 

There is documented processes and procedures for every task imaginable. Work flows are well documented, displayed for everyone to see, and discussed at regular weekly meetings.

The pretreatment line is manually indexed and offers both zinc and iron conversion coatings with a chromate sealer. Mo explained that they have more control over their parts this way and any time lost is made up through less rejects by processing perfect parts every time. Solid proof is the fact that ACC processed over 1 million Itronics handheld PC’s without a single unit returned. In spite of this slower pretreatment process, ACC is still capable of a 3-4 hour turnaround for their clients.

The day I walked their shop floor ACC was applying either powder or liquid paint to a vast array of parts for a multitude of customers including GKN, Toyota, Saab, Nissan, Honda, Jaguar, Land Rover, and ABB. They were running items like automotive luggage racks that see some of the harshest environments and require the best coating performance.

Occasionally they will take in a high end custom job, and Mo proudly showed me a pretty cool receptionist stand headed for a swanky restaurant in Greece that was painted with their special soft feel suede Nextel coating (you can see pics of this and more on our bulletin board posting of this article)

ACC has made a commitment to invest in its people by earmarking 1.5% of their annual revenue for training. They participate in a government sponsored training partnership and proudly display their “Investor in People” plaque in their lobby.

The average tenure of their employees is 10 years, with the longest being 35. ACC also solicits open collaboration from their people through regular satisfaction surveys from all employees at all levels, at all times.

As you can see it is not by mistake that Advanced Colour Coatings runs like a well oiled machine. They have implemented a well thought out plan, and all of their employees know exactly what is expected, and they go out of their way to make sure it is up to date and relevant. The end result is everyone moving together towards the common goal of superior quality in everything they do.

I would have never had the opportunity to observe such an efficient operation or befriend such hospitable folks hadn’t I kept connected to our industry with the social networking power of Face Book. Cliché or not, I’m staying connected.
This month we’re talking about a situation where member “Daniel” believes that his Nickel Chloride is too high. There is still has an outstanding question on this thread, so don’t be afraid to jump in a collaborate with your metal finishing brethren, the same way Dustin Gebhardt, Jim Trottier, and Skelton have. You can find it by going to www.finishingtalk.com/community, and choosing the Decorative Plating Forum.

Also, don’t forget to check out the Job Opportunity boards - there have been several great offerings pop up there recently. To read about these new job openings in detail visit www.finishingtalk.com/community, and choose the Job Opportunities Forum.

Daniel
My nickel chloride is about 63 gr/Lt how can i lower this value?

DustinGebhardt
First, some questions to help us with your problem:
What type of bath is this?
What is your optimal nickel chloride concentration?
What are the other bath parameters, ingredients, etc (pH, temperature)?
Are you seeing a defect from the high chloride? If so, what is the defect? Do you have any photos?

jimtrottier
Like Dustin said some more info would be nice. How did it get so high? Was it an accidental add? Or has it been growing over time? If it's been growing over time you need to figure out where its coming from. Do you use sulfuric acid and not hydrochloric acid to adjust your pH on a daily basis? Are you dragging it in from a nickel strike?

A quick way to lower it is to remove some of the bath and dilute the main bath. But if you don't address where it's coming from, you are going to have a lot of barrels of excess nickel sitting around as time goes on.

Daniel
I saw pitting on highly finished brass parts, I think too high chloride, not good for brass parts. Here is what I know... high chloride good conductivity, higher corrosive action (on zinc), lower ductility, high stress. I believe high chloride is the guilty for some pits on brass parts but you know I cannot prove it I just guess. The shiny gloss of the nickel hides the pits in the pics, but my bath is a standard watts bath pH 3-4.5 temp 40°C, chloride in watts bath 40 to 60 gr/Lt.

DustinGebhardt
I'm not convinced that the chloride is too high. 63g/L is definitely on the high end of the spectrum, but not so high as to cause pitting immediately.

More questions for you to answer:
What is the surface tension in the bath (dynes/cm)?
Is this a rack or barrel operation?
How is your bath agitated, if at all?
Are the pits over the entire surface or only on one side? If only on one side, does this side face up or down?

Have you tried adding more wetting agent to the bath or using a different type of wetting agent?

When you look at a pit with magnification, do you see a "fish eye", or a rise in the bottom of the pit?
Are the pits large and deep or fine and shallow?
Is this a brightened bath?

What is the thickness of the plated deposit?

What is your applied current density and plating time?

What is your pretreatment process?

Do you notice any oils on the surface of any baths, especially the nickel or the tanks leading up to the nickel?

Skelton

Lots of good input on troubleshooting your issue! I agree with both Dustin and Jim. I do not believe your chlorides are too high, however, determining the source of the higher chlorides is important. Start by eliminating any Hydrochloric Acid additions or drag-in of HCl pretreatment pickles/activators.

I think the term, "let's go back to the drawing board" applies here. I assume you have a Hull cell? I would first see if you can duplicate this "pitting" on a brass Hull cell panel, and for the sake of testing, run a steel panel too. If "pitting" is present in the Hull cell panel, dilute the bath by 10% and run another "as-is" panel to see if "pitting is corrected. You may possibly see a slight burn in the panel if your nickel metal is low after cutting the solution, but most importantly, is the "pitting" still present?

And another easy remedy that can address your issue is adding 0.1 - 0.2% by vol Wetter. You can of course do this in a Hull cell before making an addition to your production bath. If you cannot measure dynes, you can do the old-fashion "ring test" by making a 2 - 3 inch (5 - 10cm) "ring" out of copper or steel wire. Submerse this ring into you nickel solution and pull out and observe the surface tension of the "ring". If wetting agent is sufficient, tension will hold for 3 - 5 seconds or more. If ring "snaps" before you can observe the time (less than 1 second), you may consider increasing wetting agent in a Hull cell. And if proven successful, make addition to nickel solution.

And to address any organic contamination that may be contributing to this issue, make sure you have a fresh carbon pack or filter on your solution.

And last, make sure you are not plating at too high a current density. You could simply be on the borderline of burning and the increased current density is creating more hydrogen @ the surface of the part than the wetter can manage.

Above all, get a sample to your chemistry supplier for a second opinion and detailed analysis.

Skelton's 2-cents from his Blackberry. Good luck!

Daniel

Hello and thanks for your help.

Let me try to show the pieces and the pits i will run a sample and try to take the advice. This plating is done on racks, so I don't think the current density is the problem because the pits appear on the flat areas.

The brass parts are of shiny very high polished brass so high force and heat is applied to the part. I assume that it can make metallic soaps that create the problem could it be that?

Here is our process sequence.... Pretreatment - Degrease using solvent (nafta), Rinse, wash with alkaline detergent (by hand or cathodic degreaser), Acid, Dip (diluted 10% of H2SO4, or HCL), plate for 30-45-60 minutes.

This pitting is not present on our steel parts, but I will run a sample of highly polished steel to test it. The parts have a lot of buffing compound when we receive them.

Water break test before plate: ok

Agitation: cathode movement

Here is my theory....

High mechanical force and extreme heat cause formation of metallic soaps during buffing, lack of cleaning, chloride to high so the chloride attacks the zinc causing the material to pit.

Also some have suggested that it could be from lead smear on the machining or dezincification due to some issue (too alkaline cleaning and high content of zinc by the part, acid dips etc) I discard the lead theory because I don't see lead on the machining.

Continued on the next page....
I don't have a picture here so I draw the part, excuse me I'm not the best on drawing. (see forum online)

**DustinGebhardt**

Thanks for the pictures, they really do help. You are a much better artist that I am, so don't put yourself down about your drawing.

You have also given us some additional important information.

1. The water break test after cleaning is good. This indicates a clean surface. I do not think you have a problem with residual metallic soaps resulting from the buffing process.

2. The pitting appears in the same place, on a flat surface. You also suspected lead. I feel that the lead is probably your issue. I used to plate brass plumbing hardware that contained lead, which when machine or over-buffed, would expose the underlying lead rich zone of the alloy. To counteract this, I changed my acid more frequently. I also eliminated my mineral acid in favor of an acid salt (either sodium bifluoride or ammonium bifluoride). Lead tends to passivate (oxidize) very quickly, especially after a strong cleaning cycle. A fresh acid activator with fluoride helps condition the lead to prevent passivation until the plating can be applied. To test this out, try to change your acid bath. They are usually the cheapest bath to make up. Add some fluoride if you can. Usually 15-60g/L of ABF or SBF is sufficient. Reduce your acid immersion time to the minimum required to activate the parts.

2a. Sometimes, you can also identify the problem as lead contamination by wiping the parts with a very clean towel before plating. Be sure to not get any dirt or oils on the part.

The build-up of the chlorides most likely is coming from your acid activator being dragged into the nickel bath. Switch to only sulfuric acid if possible. And as Skelton and Jim have said, discontinue the use of HCl to adjust the pH of the nickel bath. Use H2SO4 only.

3. I agree with Skelton about the wetting agent and the loop test. When you are surrounded by good equipment, sometimes you forget about the basic tests. Especially without air or fluid agitation, the surface tension of the bath is very important.

**Daniel**

Thanks for your time. I must run the samples next week and then I will contact the forum again.

But by the way, why and/or where the lead could come from

Could it be that they are using brass for machining that has Pb?

**Daniel**

What about fluoboric acid, it is good? and what could be the correct amount of it for the acid dip?

**DustinGebhardt**

Lead is often used in brass to aid in machining. Depending upon the manufacturing process (extrusion, casting, forging, etc), the lead can cause several issues.

I'm not sure you can use fluoboric acid. The fluoride ions may be too tightly bound to the boron to be useful. But I could be wrong.

Reply by GeoffPW: 09/28/2009 - 08:27 PM

**GeoffPW**

Re plating leaded brass, fluoboric acid would be OK as the acid dip as lead fluoborate is very soluble. Suggest 5-10% by vol of 40% fluoboric acid.

If the problem continues after the advice given previously by others I would try making a fresh electrolytic cleaner and try cathodic only, but I would also suggest trying finishing up with a short anodic cycle, as cathodic only can "deposit" contaminants which can lead to staining/pitting problems and a water break free test does not always show the problem. Also when checking for water break do this after the acid dip.

**Daniel**

The fluoboric acid did it well, no pits allowed to appear this time!!

But now I see small little etching maybe known as "StarDust"

Any ideas?
It was announced at the recent Southern Metal Finishing Conference that Jim Trottier would be the Gephardt award recipient for 2009. This prestigious honor is bestowed annually to a single Finishing Talk member who is selected on the merits of their regular and helpful contributions in the Finishing Talk Online Forums. Jim was recognized with a custom engraved plaque highlighting his outstanding contributions, and was invited to present the 2010 award in person next year in Charleston, SC as a distinguished guest of the event.

“This award is all about honoring the dissemination of information in an open forum; and Jim’s willingness over the past year to share his significant experience in the surface finishing industry with fellow Finishing Talk members is a beautiful example of collaboration at its finest”. With thousands of unique visitors on the site each week, and nearly 3000 members from all over the world, Finishing Talk has become the largest online community for collaboration in the surface finishing industry. Using this broad reach, the website’s goal is to share the art and science of surface finishing in a way that helps enhance and perpetuate the possibilities for future generations of finishers.

Jim has lived in Mt. Carmel, IL for the last fifty years and was hired by Snap-On Tools right out of high school. Like so many others in his generation, his father also worked Mt. Carmel facility before him. Beginning in the machine shop he was eventually transferred to the plating department, where he excelled and quickly became their resident plating expert, where he eventually reviewed and approved any new coatings Snap-On was to consider, and was instrumental in the companies switch to trivalent chrome.

In 2003 the Snap On closed the sixty-five year old Mt. Carmel facility which encouraged Jim to take a position at Koch Originals in Evansville, IN. Here he was able to expand on his surface finishing knowledge, learning powder coating, and other organic top coats as well as new applications for the decorative plating processes he already knew very well. He once again applied his superior knowledge base in trivalent decorative chrome and helped the Evansville facility install their own non-hex chrome bath which they were able to use as a market differentiator.

Jim is married with over a dozen children and grandchildren and when he is not helping out on the Finishing Talk forums he is spending all of his free time with his family on the lake and at local football games.
same anodizing conditions when the current density is twice as high to keep a steady state for formation and dissolution. This indicates that another dissolution process must take place beside reaction (2).

This process is called the field-assisted dissolution and is a result of concentration of the field across the barrier layer, and thus of the current, probably thermally enhanced through local Joule’s heating. According to Thompson et al.2 this dissolution mechanism is due to a weakening of the Al – O bonds in the oxide lattice causing a dissolution at the film/electrolyte interface.

These two dissolution mechanisms take place with very different rates. The field-assisted dissolution takes place with rates up to 300 nm oxide pr. minute whereas the chemical dissolution is much slower with rates up to 0.1 nm oxide pr. minute2.

With this in mind, which happens both in conventional DC anodizing and pulse anodizing, let us take a look at the current - time curve obtained during the first 100 seconds of the anodizing, see figure 1. Here the process is performed with constant voltage during the anodizing process.

Period a in figure 1 shows the formation of the first microns of oxide. In the beginning the current is high due to the fact that the current only passes through the metallic aluminum. Then the current starts to decrease because of the formation of a thin non-porous oxide layer. This oxide layer has a higher resistance than the metallic aluminum. The increase in thickness and therefore an increasing resistance result in a further decrease in the current in period b.

The tendency of the curve to turn upwards in period b is due to small imperfections (roughness) in the compact oxide layer. These small imperfections are formed by the concentration of the current in areas with thinner oxide than on the rest of the surface. These areas with the small imperfection are the subgrain boundaries found on aluminum. They stated that these areas are the places where the initial formation of cells starts. The natural oxide film on either side of these subgrain boundaries is not as compact or uniform as on the rest of the surface. Therefore these areas offer less resistance to current.

Considering the formation of a single cell of oxide. At a single point the dissolution reaction is started, hence the oxide thickness is reduced and the current will start to flow to repair the damage. This will increase the temperature of the electrolyte and the solution will be more reactive and thus increase the rate of dissolution. This mechanism will perpetuate a pore once formed. Therefore some pores will perpetuate and others will never get started.

Hence the current will concentrate on these small imperfections. This will increase the electrolyte temperature in these areas. Therefore the dissolution will increase and the oxide layer will become even thinner. The current will increase as seen in period c in figure 1. Now the formation of the porous oxide layer has started. In period d the current will reach a constant level where the rates of dissolution and formation of the oxide layer reach a steady state level.

The idea of using square pulse anodizing is to have a higher average current density for the total process and hereby reducing the process time. When pulsating between two values of current density, a high period and a low period, lets the aluminum surface time to recover during the low current density period1,2,3. The time for these periods should be in the range of 10 - 240 seconds to let the two different dissolution mechanisms happen that take place during anodizing.

Both dissolution reactions take place in conventional DC and slow square pulse anodizing, though it is only by the square pulse anodizing...
the use of both is beneficial. During conventional DC anodizing the chemical dissolution will only be utilized to attack the surface of the formed oxide if the process time is too long, giving a soft outer layer. In slow square pulse anodizing both reactions are used to their best.

It is best explained by the recovery effect. When a high voltage $E_1$ is applied, the responding current will reach a steady level $I_1$ as seen in figure 2. During this period $t_1$, the resistance $R_1$ (thickness of the interface between the aluminum and the formed oxide layer) will reach a level corresponding to the forming voltage $E_1$. When the voltage is suddenly lowered to $E_2$ the current density will decrease drastically to a very small value as seen in period $t_2$. This low value of the current, some times in the range of Amps, corresponds to the very high resistance $R_1$. The electrical field across this interface in this period is very low. Hence the formation of oxide is almost zero and the field-assisted dissolution is also very slow. The main reaction in this period will be the chemical dissolution of oxide. This period is called the recovery period.

After a certain time, depending on many factors such as alloying elements, concentration of the electrolyte, temperature of the electrolyte and the value of $E$, the thickness of the interfacial layer has become thinner hereby increasing the electrical field across it. Now the field-assisted dissolution and formation will take over increasing the total dissolution rate as seen by the steep increase in current to a value of $I_2$, due to less resistance in the reduced thickness of the oxide layer.

So by using square wave slow pulses it is possible to form an oxide film with a higher average current density, and by this a shorter process time. A shorter process time gives a higher productivity with more loads through the anodizing tank4.

This article was submitted by Anne Deacon Juhl, of Aluconsult. See it online for references and contact information.

AluConsult.com
In 2009 we adopted a public relations strategy designed to build on our existing reputation and achievements. We add value to our membership by protecting their professional standing, driving up stands, improving skills and competence that reinforce sector credibility. But like wider industry, we suffer from a limited identity with decision makers. The Institute President Mr Sam Briggs challenged officers and members to think strategically about future direction and structure. A policy innovation team was formed and it became clear we need to improve communication of our identity, clarify our role and publicize activities more widely.

The Institute holds an influential position within surface engineering, but we need greater internal and external partnerships for sustainability so we can use communication channels to better service our interests. A new portable display stand went into service during June’s successful IMF AIR09 event at RAF Cosford. Two popup banners emphasizing membership benefits and education & training, were seen for the first time at October’s Surface World exhibition.

The Institute became a member of the Birmingham (England) Chamber of Commerce and Industry, the powerful voice of local business. This ensures we can enhance our reputation with local businesses, consolidation was achieved in September with my election to their controlling Council. We also connected with the Institute of Directors, the leading organization for individual decision makers across the business world.

Engaging with domestic and European politicians allowed us to highlight business needs of members and challenge these decision makers. We championed issues such as skills and legislation. Fighting for greater skills support, we took direct action and now represent surface engineering on the Sector Strategy Group of the sector skills council SEMTA. The Institute is building an impressive network of contacts with decision makers, supporting organizations and trade bodies.

A Public Relations Working Group has been formed with the responsibility to manage and develop the Institute image, improve message delivery, connect committees, groups and branches through a common strategy and lead on PR matters whilst supporting Institute officers. It has established five long term goals that will shape and drive actions: 1) Build a positive reputation for the Institute 2) Establish our role as a key influencer 3) Engage with policy and decision makers 4) Ensure consistency of message and image 5) Address the recognition needs of the sector

In 2010, the Institute team is set to build on these fundamentals, to formalize and clarify our image, increase publicity of events and news. We will profile sustaining members and strengthen links with business, national and internal decision makers whilst promoting ever greater cooperation with other sector representatives on strategic issues. Long term the Institute will gain from an increased level of awareness and understanding. These initiatives will serve to develop our reputation and influence, thereby supporting the wider sector in a proactive and positive manner.
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zations. Unlike traditional advertising and Public Relations, Social media solicits audience participation and often real time interaction. You have social networking sites like YouTube, Facebook and Twitter to name a few. As more and more people turn to the Internet for their daily dose of news and entertainment, socials sites will continue to expand and grow in prominence. Is Social Media right for you? Only you can decide if it would benefit your organization. There are advantages and disadvantages to consider. Let's take a brief look at the ups and downs of Social Media.

The Good: Social media enables companies to enlist participation by their audience either through on-line posting, video blogging or other methods such as on-line gaming. Word of mouth between participants and frequent postings creates a 'family' atmosphere. It brings the once distant company into their homes via the computer monitor and enables them to interact in ways never before possible. What was once a two-way discussion now becomes a public situation. This can be a positive situation if they are saying good things about your company or negative if they are posting something bad.

The Bad: On-line posting enables people to share their thoughts about a company and discuss situations with others. As long as the people are saying something positive, no problem... but if someone posts something negative about you or your company on the internet, millions could potentially see this. It could form negative opinions about your company no matter if the information accurately portrays the situation or not. So, if you are determined to engage in Social Media, you had better be prepared to have people dedicated to monitoring the Social Media sites and alert you to anything that might be considered detrimental to your company. And, once you identify a negative situation, you must react quickly to counter it. If you participate in Social Media, you must be prepared to add people... whether they are freelance or on staff, only time will tell how many you will need to effectively cover the Social Media sites.

The Ugly: Negative on-line exposure tends to take on a life of its own. People love seeing and hearing bad things about others. It is human nature. Seeing something bad about someone else makes people feel good about themselves. They can sit back and say, "Whew... glad that isn't happening to me." So, no matter how quickly you react to a negative situation, there will be residual on the Internet. Things do not go away. Just try doing a Google search on your company's name and see how many references come up from years past... things you had forgot-
ten about... things that you weren't aware of. It is all there and archived. So, even though you are able to react quickly, it may not squelch the negativity surrounding the initial event.

You may not have a choice whether or not you want to participate. If people are posting blog comments... on-line videos... or anything else that pertains to your company, you have just been sucked into on-line Social Media. If this is the case, you have two choices. You can either decide to just ignore it and hope it goes away, or you can delve into it and take positive steps to ensure the integrity of the information being broadcast.

Social Media is PMR:

- Participate
- Monitor
- React

Once you decide to delve into Social Media, you must be prepared to participate, monitor and react quickly in order to maintain the integrity of your 'Brand'. It takes time... it takes people... it takes dedication.

Written By:

Bill Howard
421 Runnymede Drive
Rock Hill, SC 29732
Home: 803-817-1889
Cell: 803-517-5418
Website: www.themarcompro.com
Forty members and guests of the Palmetto Branch of NASF recently toured the BMW Manufacturing Plant in Spartanburg, SC, then socialized at On the Border. The tour was sponsored by Kevin Helton, Crossair LLC.

Guests included Jim Jones, Dixie Industrial Finishing, current NASF board member. BMW employs 5,000 at this plant, their only manufacturing facility in North America. It currently builds the X5 and X6, and assembles about 700 vehicles per day. Members enjoyed seeing the high degree of automation, including 383 robots, and the logistical precision required to run this operation.

Other interesting facts included that no cars are built to inventory, all are built to order. This BMW assembly plant, unlike many others, ships all over the world. Paint color changeovers are achieved in 18 seconds. The plant has 2.5 million square feet under roof, and is currently undergoing a $750 million addition.

DO YOU BELONG TO A LOCAL SURFACE FINISHING GROUP?
If so we want to know what you are up to. Post your groups information and event news on the Finishing Talk boards and we'll share it with the world.

www.finishingtalk.com/community
Thin Layers for Optimized Characteristics

Optimized pre-treatment and activation is essential for reliable, sustainably stable paint adhesion. Processes involving solvents are frequently used to this end. Plasma technology represents an environmentally sound, efficient alternative, and offers numerous additional effects as well.

In the case of metals, it’s usually oil and grease that gets in the way of continuously reliable paint adhesion – especially where ecological water-based paints are used. In order to remove quality impairing contamination which usually originates from production, the coated parts are run through an environmentally harmful, energy and time-intensive pre-treatment process. The fact that this can be accomplished in an environmentally sound, economic fashion is substantiated by plasma technology. Not only all technical metals, but rather practically all substrate materials as well can be treated by means of this process. Processing is dry, contactless and non-abrasive. Correct selection of the various process parameters such as type of utilized gas, gas throughput, pressure, electrical power and treatment time allows for ideal matching to the respective application.

Plasma – the Fourth State of Aggregation

Plasma is formed by adding energy. The smallest building blocks of solid material (atoms and molecules) initially start to move, and then pass over into the liquid state. Adding more energy causes these building blocks to abandon their respective compounds and move about freely – a gas is created. If even more energy is added, the gas is ionized. The particles move so quickly that the charge carriers (electrons) detach themselves from the atoms and molecules. Surfaces can be precision cleaned, activated/modified and coated with these active gas particles, without causing any thermal stress to the surface.

Different Process Variants

Two different technologies are available to this end: In the case of low-pressure plasma, treatment is carried out in closed chambers in a partial vacuum. This makes it possible to clean work pieces with complicated shapes as bulk goods or individual parts. The use of a great variety of process gases is also possible, because treatment takes place in an evacuated, sealed space. With rates ranging from 0.1 to 0.5 liters per minute, gas consumption is significantly lower than for atmospheric plasma systems.

Direct and indirect corona discharge (dielectric barrier discharge) takes place under ambient pressure. With the first variant, the discharge (plasma) strikes the work piece directly. In the case of indirect atmospheric-pressure plasma, which makes use of so-called plasma heads (nozzles), discharge takes place at the plasma head and is directed to the surface to be processed by means of compressed air. The range of applications includes above all the treatment of substrates with large surface areas, for example coils, aluminum and steel strip, and foils. Systems with widths of greater than ten metres can be implemented with direct corona discharge. Thanks to simpler technology without vacuum components, the investment costs are lower and atmospheric-pressure plasma systems can also be more easily incorporated into automated production lines.

The plasma-spot has been developed as a device for inline capable processing, and lies between atmospheric and low-pressure plasma. It consists of a plasma head which is individually matched to the surface to be treated, and a supply unit with integrated, fully automated controller. The plasma head is set onto the surface during treatment, and the low-pressure plasma process is started. Processing times range from one second to ten minutes, depending upon the material. This process is used in particular for localised, selective treatment before painting, bonding and printing, as well as for repairing paint damage.

Pre-Treatment for Painting with Plasma

Above all thin organic contamination such as auxiliary processing materials can be effectively removed with low-pressure and atmospheric plasmas. For example, fast and effective cleaning results can be obtained for oil films with thicknesses of up to 100 nm. In most cases air is used as the process gas for cleaning before painting processes, and the material removal rate increases along with oxygen concentration. The removal of inorganic contamination with plasma is only possible to a limited extent, and in some cases not at all.

The surface is simultaneously cleaned and activated during plasma treatment. This dual function is based on the physical and chemical characteristics of the process: The atoms released in the low-pressure plasma “bombard” the surface of the component to be cleaned. This functions like a miniature sand-jet in the nanorange, thus removing organic contamination which adheres to the surface such as oil and grease, and to some extent inorganic contamination as well.

With both low-pressure and atmospheric-pressure plasma, organic contamination is broken down into short, volatile chains, and is oxidized into water and carbon dioxide by means of chemical reaction with the oxygen. At the same time, free ions and electrons react with the surface, thus forming polar groups. Consequently, surface tension is adjusted to an ideal value for the subsequent painting process. Surface tensions of greater than 72 mN/m can be achieved in this way by means of plasma treatment. As a result, the surface becomes highly wettable which assures ideal painting conditions when water-based paints are used on metals, as well as when coatings difficult to paint plastics, thus contributing to reduced scrap rates.

Coatings for Good Adhesion and Corrosion Protection

Plasmas can also be used to apply thin layers to metal surfaces, for example the siliceous precursor hexamethyldisilazane...
(HMDS), which promotes good adhesion to metals, as well as good chemical bonding of the paint. For example, the adhesion of epoxy paints to metals can be improved with a coating of this sort.

The deposition of temporary corrosion protection layers is also possible as an alternative to the use of oil. This coating has to be removed or activated before painting, but this can be accomplished simply and efficiently with a second run through the plasma system. This eliminates the necessity for the separate, wet-chemical cleaning step which is required for the application of oil which is currently common. Research institutes and industry are now working on the development of coatings which provide good temporary corrosion protection and promote good adhesion without further treatment before painting.

Optimizing Painted Surfaces In particular, low-pressure plasmas can also be used to improve resistance to scratching, and to increase the hardness of UV resistant paints. In this application, the UV component of a plasma generated from, for example, argon gas is used for better cross-linking of the UV resistant paint. With low-pressure plasmas, the benefits of UV resistant paints can also be taken advantage of for geometrically complex parts, which normally only coat the readily accessible areas under normal cross-linking conditions.

The possibility of depositing layers onto surfaces in a targeted fashion during the plasma process makes it possible, for example, to furnish surfaces which have already been liquid painted with special characteristics. This includes the targeted deposition of glass-like layers in order to increase hardness and resistance to wear.

Priming with Plasma Plasma technology offers problem solving advantages when joining and painting components made of different materials such as metal and rubber. In this case, a matching primer coat can be deposited onto the rubber part in combination with cleaning and activation. On the one hand, this allows for permanent bonding to the metal part, and on the other hand assures adequate, homogeneous paint adhesion to both components for a good external appearance.

A plasma coating used for grates and other production equipment which are contaminated by overspray provides for intentionally poor paint adhesion. The coating, which adheres well to galvanized and hot-dip galvanized steel, stainless steel, aluminum, plastics and painted surfaces, demonstrates a distinct anti-adhesion tendency where water and solvent-based liquid paints are concerned. As a result, paint can be easily removed from affected production equipment with the help of a high-pressure water jet without any residues in an environmentally sound fashion.

Thanks to diverse possibilities offered by targeted surface modification such as cleaning, activation, coating and metallization, numerous tasks throughout the painting process can be technically and economically optimized by means of plasma technology.

Submitted by: Doris Schulz

PaintExpo
Leading International Trade Fair for Industrial Coating Technology
13 – 16 April 2010
Exhibition Centre Karlsruhe, Germany
www.paintexpo.de

PaintExpo - Leading International Trade Fair for Industrial Coatings Technology

Covering the entire process sequence in the field of coatings technology and offers a comprehensive overview of the latest developments in the areas of liquid painting, powder coatings and coil coating, as well as paints and pretreatment with various methods including, amongst others, plasma technology. Nearly all renowned suppliers of systems, application technology and paints will participate at the leading international trade fair for industrial coatings technology. This allows visitors to gather detailed information in a targeted fashion, and to make direct comparisons of various systems and processes at a single location.

PaintExpo will take place at the exhibition centre in Karlsruhe, Germany, from the 13th through the 16th of April, 2010.
This year the Conference started off with a new twist.

The first annual Fishing Tournament sponsored by PF Online was held early (and I mean early) Sunday morning when a group of us met up with Hot Shot Charters over at the Ashley River marina. I can say from firsthand experience that there is nothing quite like seeing the sun rise over downtown Charleston. We’ll except for maybe landing a 50 inch Wahoo – but you’ll have to ask Leif Walther of Greystone about that. Almost everyone caught fish on this trip…..which was cooked up by Chef Tommy at the Francis Marion later that evening and served to a group of about 20 of us.

The 6th annual Swamp Fox Scramble Golf Tournament sponsored by Finishing Market, was held later that morning on September 13th at Patriot’s Point Links golf course on Charleston Harbor had perfect weather….especially if you consider how miserably hot it has been over the past few years. Team “Go For It” took the first place trophy that team consisted of Bruce Sigman, Cubex, Inc.; Scott Sawyers, Ato Tech; Roger Kerstin, Oxford Instruments & Tim Fender Greenwood Fabricating & Plating. Aron Lorenz WMV, Inc. & Rob Eischen of the Allen Lund Company had the longest drives, and Paul Skelton, Finishing Market, and Aron Lorenz of WMV had the closest to the pins - Aron’s was on the signature island hole and was nearly in the cup!

The reception was open to all attendees, and kicked things off in style with appetizers and an open bar sponsored by American Plating Power and PF Online, and. It took place in and around the Exhibit Hall, where conference goers had a chance to meet with some of the exhibitors while mingling with other industry professionals in a fun and casual setting. Live entertainment was provided by the co-hosts of the popular online metal finishing show, Finishing Talk Live, and Episode #9, one of the best live tapings of the show yet was captured at this event.

The Southern Metal Finishing Tabletop Expo took place on September 13th and 14th. More than 25 exhibitors from all over the country set up tabletop displays and discussed their products and services with our students during breaks and scheduled visiting times.

"Jon Allen, Sr. Vice President of RamQuest, talked to us about..."
"Galvanizing customer relationships in a challenging marketplace" for our keynote speaker on Monday.

The presentation was an overview and discussion on the steps required to build strong relationships. His presentation was a thought-provoking discussion on new ways to think about your existing customer relationships and how innovation can help solidify winning partnerships. We all learned a little about how to move beyond the traditional customer-vendor relationship model and become a strategic partner in business with our customers.

The Scavenger Hunt and Pub crawl was just as popular as ever, and a huge success by all accounts. We had 8 teams competing for cash prizes on the streets of Charleston on the evening of September 14 (some of which I don’t think we ever saw again) to turn in the best score sheet resulting in solving the riddles, tasks, executing tasks, challenges, etc... throughout downtown Charleston. The whole thing wrapped up with another exciting Rickshaw Race back to the Francis Marion – it was a blast! Dianne Patterson was awarded the honorary “Hard Core Crawler” award for her sincere dedication and determination - year after year.

The Awards Ceremony on Tuesday September 14th was the last official event for the 2009 conference. With the full attendance of over 60 students, we announced the winner of the, “The Gephardt Award” which was given this year to James R. Trottier, an Expert Electroplater from Southern IL. The Gephardt award is to honor those who most unselfishly share their knowledge, and experience with the Finishing Talk Online Community Members.

Following this special Finishing Talk announcement, we honored our Fishing Tournament’s best catch, the Golf Tournament’s winning team, longest drive, and closest to the pin, and presented the Hardcore Crawler award.
The ET Foundation—the educational and scientific organization devoted to promoting and advancing aluminum extrusion processes and technologies—is seeking entries for the 2010 International Aluminum Extrusion Design Competition. Professionals along with students studying design and engineering are invited to enter their exceptional aluminum profile designs for an opportunity to win cash prizes. Hydro Aluminum once again will be the sole sponsor for the cash awards, totaling $18,000, including a Grand Prize of $3,500. The ET Foundation will accept entries for the 2010 International Aluminum Extrusion Design Competition until February 15, 2010. Entry in the competition is free.

The 2010 competition is divided into two classes: Professional and Student. Winning entries will be those that best demonstrate the benefits of aluminum extrusions. The designs submitted should address any combination of the following objectives:

- ease of fabrication and assembly
- cost-effectiveness
- innovation and/or customization in design
- new application capability
- demonstration of aluminum extrusion’s product and process advantages, and
- likelihood of market success.

Designers Encouraged to Innovate Innovation is a key objective of the competition, which encourages extruders, designers, fabricators, engineers, manufacturers and students to hone their skills and develop new techniques and uses for aluminum. “Often, designers and engineers are at the forefront of innovation; thinking outside the box is standard practice,” said Tom Schabel, Chairman of the ET Foundation Board of Trustees and CEO of Alexandria Extrusion Company in Alexandria, Minnesota. “The Aluminum Extrusion Design Competition encourages these innovators to use aluminum profiles in their product designs, and in turn, learn more about the countless material and process advantages of aluminum extrusions.”

The advantages of the aluminum extrusion process are numerous; most beneficial to designers is the freedom from standard-shape restrictions. The aluminum extrusion production process can accommodate a broad range of profile designs, allowing the designer to create the exact shape needed. In
addition, the aluminum profile can be formed to facilitate manufacturing and assembly, increase product reliability and durability, simplify maintenance and repairs for the product’s final use, and build in an attractive appearance that can make the final product more appealing to the customer. Moreover, aluminum extrusions offer shorter lead times than other processes translating to product delivery within weeks rather than months, and provide a more cost-effective option as extrusion tooling is less expensive than other manufacturing methods.

Professionals to Compete for Cash Prizes Individual architects, designers or engineers, as well as companies, are eligible to enter the Design Competition. Aluminum extruders are encouraged to team up with their customers and enter the competition. Entries received in the Professional Class will be divided into three categories: Structural, Transportation, and Engineered Products. First-Place cash prizes in the amount of $2,000 will be awarded to the best design in each category. The Structural Category may include designs for such applications as architectural façades, fenestration products, modular building systems, exhibit display booths, ladders and scaffolding, bridges and bridge decking, and office component systems. The Transportation Category may include designs for applications in the automotive, truck/trailer, recreational vehicles, rail, aerospace, and marine markets. The Engineered Products Category may include designs for applications such as sporting goods components, lighting, furniture, appliance and electronic components, scientific or industrial equipment, and food display and refrigeration equipment. These are only a few possible applications for aluminum profiles. Visit www.ETFdesign.org to view winning entries from previous competitions.

Students Compete for Thousands of Dollars in Scholarship Awards Exposing students to new ideas and challenges stimulates their creativity and encourages them to explore unique concepts of their own. Scholarships will be presented as cash awards to the top student designs, including $3,000 for First Place, $2,000 for Second Place, and $1,000 for Third Place. Students also may compete for the Hydro Sustainable Design Scholarship Award of $2,500. The Sustainable Design Scholarship Award is presented to recognize the student design that best addresses environmental and/or societal concerns, and must be a viable extrusion-based product that meets the demands of the environment while contributing to the quality of life for its intended users. Past Sustainable Design winning entries included a portable modular shelter for disaster victims, a mobile sediment pond barrier, and a streamlined traffic-light post.

Newly Updated Website Provides Design Tools and Resources Aluminum profiles can be the solution to many design challenges. In order to communicate the advantages of extruded aluminum to engineers, designers, students, and others, a variety of tools and resources are available at the ET Foundation’s Design Competition website at www.etfdesign.org. From an overview of the aluminum extrusion process and choosing the right aluminum alloy, to design considerations and useful publications, the website contains a wealth of valuable information and resources to help with the design process.

A new slide presentation, “Designing to the Limits of Your Imagination,” is available to download from the site. The educational presentation, developed by the Aluminum Extruders Council (AEC) and the ET Foundation, provides an overview of designing for aluminum extrusions and outlines the advantages of aluminum and the aluminum extrusion process. Other resources include a page on Designing for Aluminum, which features information on aluminum extrusion design parameters, and a useful Press Availability Matrix that illustrates the relationship between profile design size and the availability of extrusion presses to produce the profile. The page also includes a number of links to valuable information and resources available on the Aluminum Extruders Council website.

A Call for Entries for the 2010 Aluminum Extrusion Design Competition, including the official entry forms, will be available to download at www.ETFdesign.org, or to request a copy to be mailed contact the ET Foundation at mail@etfoundation.org.

The Extrusion Technology for Aluminum Profiles Foundation—ET Foundation—has been established for charitable, scientific, and educational purposes to develop, promote, provide, and fund education and research related to aluminum extrusion processes and technologies. The ET Foundation is dedicated to providing superior educational programming and opportunities to promote the global exchange of new and improved technologies in aluminum extrusion.

For more information, contact the ET Foundation:

Nancy Molenda
Communications Manager
1000 N. Rand Road, Suite 214
Wauconda, Illinois 60084, USA
Telephone: 847.526.2010
Fax: 847.526.3993
INTERNATIONAL COLLABORATION
TIME TO EMBRACE THE NEW FLAT WORLD OF SURFACE FINISHING

My European outreach mission started and ended the same way - trying to cram two weeks of clothes into one carry-on piece of luggage. Looking back I find this an analogy to describe the entire trip. There was just so much to do and so little time. Thank goodness for the internet, otherwise I'd have never kept up with the great relationships, goodwill and partnerships that were created on this trip. It started with the exemplary display of dedication at our booth in Stuttgart at the Parts2clean expo and extended to happily sitting through 10 hours of technical presentations on the aerospace industry. Listening to the world’s most brilliant minds of this industry segment was mindboggling and before I got my feet firmly on the ground I found myself looking in the face of a Green Day concert going on next door to the Surface World venue in Birmingham, England, as an encore to a pretty encouraging finishing expo.

Anticipating this article I eventually saw it as a perfect way to tie together two previous editorials, “Mission Critical” and “A Strategic Review of the Surface Engineering Industry”. To me a trip to Europe is inspiring to the level of distraction. It never fails that with each trip I am besieged with new ideas, new friends in which to build these ideas and new ways of looking at everything around me. A few standout issues are common across the board and this something that I’ll share with you this issue.

The future of national associations promoting the science of surface finishing is at a tremendously precarious position in history. First, it has been confessed by many of those at the senior levels of lobbying for the Finishing Association that most of the laws we lobby so hard against are first created in Europe then handed down to California and finally to Washington, DC. We then spend millions of dollars trying to protect our industry from these statutes. Just take the interview with Bill Saas in the November 2009 Products Finishing Magazine, in it Bill admits that the regulatory landscape has changed and if you read between the lines is it an international finishing confederation that is making these changes.

I spoke of this in the “Mission Critical” editorial, but long before writing this - it has been said around all corners of the globe. I now have proof that countries such as England, France, Denmark, Germany, The Netherlands, and others are looking for a better way to not only protect our industry’s current position, but also to recruit the next generation of engineers. In discussions with industry representatives from each of these countries, these sentiments came not only from the countries that you would expect, but there are similar movements in places like South Africa, Saudi Arabia, Kuwait, India, and as you would expect China as well.

Now I realize that the proprietary information argument may be one of the strongest arguments against this, but when you step back and think through the history of electroplating, it always goes hand in hand with the industrialization of a country. The technology originated in Europe and the Middle East (depending on which history you choose to follow) and has followed the never ending wave of industrialization since its beginning. It is visiting the US for a period, but will move away from us regardless of what happens. The best thing we can do is become part of the energy and thus the one of the driving forces and help direct the wave. To further the analogy, to not go with the flow would be to attempt to be the beach which changes every minute in spite of its natural inclination to remain the same. Either get with the times, or be prepared to get run over by it.

Parts2clean is a fine example of the type of international collaboration that is possible when two or more groups work together with an open mind for the better good. It is also a very positive story of two family businesses working together to help make the industry better. Parts2clean Director, Hartmut Heriden didn’t know me from the man in the moon when I first showed up in his media pavilion during his 2008 show. Yet by the end of the event I felt like royalty. I brought this good feeling back with me to the states and I shared it with Gardner Publications. They happened to be in the process of establishing a new event to go along with their new magazine Parts Cleaning, for Louisville, May 2010 called the Process Cleaning Expo or (PCX 2010). When your mind is open things like this tend to migrate towards you and this is what
I think is real growth, both professional and personal.

**Parts2clean 2010** The show itself was first class, both in the type of attendees, and the exhibitors it attracted. We talked with dozens of people at the Process Cleaning Expo booth and were amazed at the overwhelmingly positive support we received. Hartmut and his European contingency now have a well publicized and known platform from which to exhibit in Louisville. We hope that this will help encourage some of the smaller European companies to get their feet wet, and try exhibiting their products and services in one of the largest industrial markets in the world.

**A3ST Aerospace Symposium on Light Metals** I wasn’t sure that I was actually going to get into this event. In spite of aggressive attempts to contact this organization through several messages to the office administrator and director of the French Aerospace Association I never did get a response. So on the morning of the event, I walked up to the registration desk and with my funny accent (you know the one - if not see Finishing Talk Live Episode #9) tried to get the ear of the event organizer. After they discussed what I was trying to say amongst themselves for what seemed like a half hour, I started hearing a bunch of wees’, and felt like I was on the right track. About that time I’m introduced to Alain Viola – yes Viola – just like what the magicians say! He appeared just like that “Viola”. Anyway Alain turned out to be one of the most interesting people I met on this trip. He took me to a side room of the event and gave he his attention for a good 15 minutes while we discussed the future of associations, recruitment of new engineers and some of the other issues facing his segment of industry that were in common with other parts of the world.

Then to my surprise, I was handed a full conference badge and pass, and invited to stay as long as I liked. It was only an hour or two into the formal program that I decided it was a shame I couldn’t stay for the second day of presentations. The papers were actually about new ideas, theories, issues and concerns, not the same old stuff that we’ve been hearing every year back in the states. It was comforting to know that there are actually people out there engaged in R&D on the highest of levels all around the world. All on the same mission of improving the existing surface finishing sciences for the sake of the end product and for the sake of the industry itself.

My favorite presentations of the day were Dr. Anne Juhl’s talk on the cost benefits of Pulse Anodizing, and Dr. Gary Critchlow’s discussion on the perfect anodic coating for the bonding of aluminum layers. The night ended with Gary, Alain, and myself sitting outside (because they gave us each several beers, then promptly locked us out) of the Citron Café arguing over what country produced the best Rock and Roll. I have to say I was at a disadvantage, and couldn’t name more than a couple great American Rock and Rollers. The last thing I remember was finding a cab driver who charged me 60 Euros because the subways had closed hours ago.

**Surface World** The next day at 5:30am I found myself dragging my carry-on’s two week’s worth of luggage down empty streets between the Gare DeLest and Gare DeNord. I’m lucky I made it really, considering I landed at the Holiday Inn at 4:00am. I basically had just enough time to figure out how to get that suitcase closed again (something that got more and more difficult each time I did it). Then I saw her, The Eurostar! But first, and thank goodness I showed up early, I had to pass through customs and immigration at the train station. While they are much more efficient than their counterparts in the airports, it was still something that was unexpected. Finally on the platform I was a little dismayed when I found my seat about as far back as you could possibly walk on the train. It was dark most of the trip (and I think I slept for an hour or so too) but I really didn’t feel like I was doing nearly 200 mph – it was all a blur at this point anyway.

I was rousted from my stupor when the train arrived in London – in 2 hours and 15 minutes I might add. Note to self – always expect the unexpected when traveling in new countries. Seems there are two train stations on the same street in London, and you have to actually walk about 10 city blocks to get from one to another, so needless to say between discovering this, my dizzied haze and the amazement with seeing London for the first time ever – I missed my connection by a long shot. So I ended up in their customer service line (I swear it was

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Paul and I discussed the pros and cons of an internationally based confederation of metal finishing associations that would work on a global scale to enhance the industry’s position both in the minds of the public, students, but also with politicians. By the time dinner was over we decided that it would be a good idea to follow up on this concept scheduling a round table discussion on the topic in Charleston next year at the Southern Metal Finishing Conference.

The date for this round table discussion will be October 3, 2010 in Charleston, SC at the Francis Marion hotel. If you are involved in the Surface Finishing industry and would like to be part of this new discussion please contact me to get on the invitation list. The meeting will be open to all those who are sincerely concerned about the future of our industry, and are willing to work with others around the world to protect it.

Paul Wynn of the Institute of Metal Finishing and Paul Fisher at Surface World 2010 -Birmingham, UK
For decades leading climatologists and atmospheric scientists have warned us of a progressive change in the climate thought to be due to an increase in greenhouse gas concentrations.

The majority of thinking people understand this although they may be uncertain as to the urgency and possible relevance of these purported trends. Recently the media has uncovered commentary excerpted from the purloined email messages of a few scientists that, at the very least, cast some suspicion as to the veracity of some of their data analysis. Few of us, I’m certain, have had the time of luxury of reviewing these comments in their full context.

Whether you trust the positions taken by the overwhelming majority of climate scientists or the pesky pundits ever pervasive in the media, you can’t dispute the seismic shift in the global climate of the finishing industry. Regardless of how long you have been in the industry, never have we experienced such a revolution in how and where we manufacture our products. I don’t need to remind any of you of the economic tsunami that we have all endured over the past 15 months. Global in magnitude and far-reaching across every economic activity and all commerce, this crash affected not only the well-established industrialized Western economies, but also those of the emerging markets in Asia, Brazil and Eastern Europe.

Surprisingly the developing countries have rebounded much more quickly than the established ones. China emerged rather swiftly from the economic crash and its economy is expanding as fervently as it was before the recession.

Hundreds of thousands of manufacturing jobs have vanished from North America and Western Europe in a major migration to countries boasting labor costs only a fraction of those in the West. In spite of the high productivity prevalent in Western cultures, these low labor rates preclude a realistic recovery of the majority of jobs lost. In addition, regulations governing the environmental impact of our industry have become more aggressive worldwide. The developing nations however, experience a significant lag in the enactment and enforcement of the strictures that impact our bottom lines.

It is paramount that we keep engaged not only with local and domestic issues, but it has become imperative that we have to view our business in an international sense. What happens in the finishing industry in Beijing or Brasilia affects what happens on Main Street. The enactment of a new regulation by the European Union impacts our businesses overnight. And staying engaged means plugging ourselves into the new methods of communication and participating in key associations not only locally but globally.

So how can we survive? We must recognize this sea change and aggressively pursue alternate strategies. My friend and colleague, Paul Fisher, presents a new found manner in which to reach customers and colleagues. The use of Facebook, twitter and other social/professional networking media is the new way to stay connected. Furthermore we can no longer remain complacent and comfortable in our regional professional associations. Paul recognizes the need to join forces across cultural and geographic to promote and foster an equitable and fair debate regarding regulations faced by the finishing industry, rather than letting trends and policy be developed on the other side of the world and waiting for them to come to us.

Another change, minor though it is, pertains to this publication. I will be taking over the reins as editor. My background is decidedly technical in nature as I have been a formulator and manufacturer of powder coatings for over 30 years. Delivering a relevant message to the finishing industry has been one of my passions for the past few years. In addition to my industrial pursuits I was the technical editor of Finishing Today magazine in 2006 through 2008. So I will be bringing my humble insights to you in each edition of Finishing Talk.