Perlite Institute Holds Successful Annual Meeting in Utah

Members gathered at Park City, Utah, Sept. 7 through 10, for the Perlite Institute’s Annual Meeting. Read more about the meeting in the Executive Director’s Message on page 3 and in a wrap-up article on page 4.

The Annual Meeting included a tour of nearby Salt Lake City.

Members enjoyed a tour of Hess Pumice during the Annual Meeting.

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Message from the President

by Linda Chirico

What an Unforgettable Meeting in Park City

Highlights of our 2014 Annual Meeting in Park City, Utah, are presented in this newsletter. It was truly an unforgettable meeting. I would like to thank Mike Hess, his family and the entire Hess Pumice/Perlite Company for their warm hospitality, the fine western barbecue lunch on the lawn and the well-organized tour of their mining and processing facilities. What a beautiful day!

We live in exciting times of sweeping change, but the Perlite Institute has adapted well and continues to be a vibrant organization. Our hard-working Board of Directors, committee chairmen and volunteers are responsible for the success of the Perlite Institute, and I am grateful for all of your time and support over the past two years.

It has been both an honor and a pleasure having served as your president. I wish you all the best as 2015 approaches, and I leave you in the capable hands of our new president, Matt Goecker.

Join us in 2015 in Barcelona, Spain!

Don’t miss out on the 2015 Annual Meeting to be held next fall in Barcelona, Spain. Watch the Perlite Institute website and check your email as details about this event become finalized.

Barcelona is home to many World Heritage Sites.

Photos, clockwise from top:
- Palau de la Música Catalana
- Façade of the Nativity and crypt of the Sagrada Familia
- Park Güell
The annual meeting held in Park City, Utah, was one sure to go down in history. What a wonderful meeting! From the tour of Hess Perlite to the informative presentations and the entertaining band, Due West, there was something for everyone at the 2014 Annual Meeting!

I thought I would pull out some of the highlights of the meeting for those who couldn’t be there and as a reminder to those who were able to attend:

**Tour of Hess Perlite**

Thanks to Mike Hess and his team at Hess Perlite, we were able to visit both the pumice and perlite mines and the actual operations. It was wonderful to see Marvin and Sandra Hess again and observe what the next couple of generations have done to expand the business. The staff was very informative and hospitable with our group. It was an amazing time!

**Speaker Presentations**

We were treated once again to some phenomenal speakers and topics at this year’s meeting. From Chuck Vogelsang’s presentation on AirFlow Systems to Brian Jeppsen entertaining us with an amusing song prior to his safety talk, the speakers were engaging, interesting and willing to answer all questions posed to them. And we couldn’t have had the flow we did without our President, Linda Chirico, leading the way!

**Exciting Entertainment**

For the first time in a very long time, we had entertainment at the banquet! Thanks to Mike Hess and his connections, we were able to secure Due West, a country band based in Nashville. The band members were wonderful, and the music was upbeat. It certainly got many of our members up onto the dance floor by the end of the night!

I would like to thank the entire Hess family, especially Mike and Danece, for their hard work and hospitality during the meeting, Linda Chirico for her wonderful leadership of the Perlite Institute over the past two years, and Due West for their amazing rhythms and fun banter at our annual banquet. You never know what is in store for next year in Barcelona. Get ready, Spain! I hope to see all of you there.
Perlite Institute Gathers in Utah for Successful Annual Meeting

More than 50 members traveled to Park City, Utah, this past September to participate in the Perlite Institute’s Annual Meeting. Participants heard speakers present on such topics as perlite packaging, geology, high-incline Cambelt belt conveyors, the fabric filters, biological systems on organically enhanced growing media, safety, the history of Harborlite Corporation and air-flow problems in perlite processing. Committee reports and the annual business meeting were also part of the Annual Meeting, which was held at the Waldorf Astoria Park City.

Members and guests enjoyed various social activities while in Park City. Members toured Salt Lake City and viewed such sites as downtown Salt Lake City, the Mormon Temple Square, the Utah State Capitol Building, the elegant mansions of South Temple, the University of Utah and This Is the Place Heritage Park. On Monday, spouses and companions were given time on their own to view Salt Lake City’s museums, eateries and shops. Tuesday offered the opportunity for the full group to tour Hess Pumice in Malad City, Idaho.

Special thanks are extended to our hosts, Mike and Danece Hess and family, from Hess Pumice, and to the Meetings and Membership Committee members Rick Willis (chair), Linda Chirico, Mike Hess, Kathryn Louis and Jeffrey Sheehy for their hard work and dedication to the planning of the program, topics and speakers.

The 2015 Annual Meeting will be held in Barcelona, Spain, in October 2015. Please watch the Perlite Institute website for updates.

2014 Annual Meeting Materials Online

One of Perlite Institute’s member benefits is the ability to learn about new developments in the industry. Whether or not you attended the Annual Meeting in Park City, you may access electronic copies of the speakers’ presentations at www.perlite.org. Other materials from the Annual Meeting have also been posted on the website, including the Annual Meeting minutes, photos and the final attendee listing.
Renew Your Membership for 2015

Please remember to submit payment for your 2015 membership dues by Dec. 31 when the membership renewal season ends. The first mailed invoices were issued in mid-October. You can renew your membership by mailing your payment to the Perlite Institute headquarters at 2207 Forest Hills Drive, Harrisburg, PA 17112 USA or faxing it to 717-238-9985.

Click here for more information about membership in the Perlite Institute. Don’t let your membership lapse! Don’t delay and renew today! Thank you for your support of the Perlite Institute.

Perlite Institute Welcomes New Director of Communications

Michelle Keyser recently joined the Perlite Institute as the Director of Communications. She will oversee the communications and marketing functions of the association.

Michelle has worked in public relations and marketing for more than 25 years where she has experience with developing, implementing and evaluating corporate communications, marketing strategies, brand creation and management, strategic messaging, media relations, advertising initiatives and new media. She is skilled at identifying stakeholders, targeting audiences and developing key messages to build internal and external brand identity and loyalty.

During her career, Michelle has worked in both the non- and for-profit sectors. She has spent the last several years as a PR and marketing consultant in a variety of industries including, but not limited to, government, specialty food, health care, association management, manufacturing, retail, long-term health care, faith-based and commercial.

Michelle is active in her community and professional organizations. She is an international speaker and works as a mentor for small businesses and nonprofits worldwide. She holds an Associate of Science degree in accounting and earned a Bachelor of Arts degree in marketing and communications from Messiah College. She also did graduate work in communications/journalism at Shippensburg University of Pennsylvania.

Who’s Visiting www.perlite.org?

Did you know the Perlite Institute website, www.perlite.org, receives thousands of visitors each month? Consider these facts about web traffic to the site during the third quarter of this year:

• During July, August and September, the site had 8,857 visits.
• Of those visits, 76.5 percent were from new visitors.
• A total of 19,801 pages were viewed during this three-month period.
• The average visitor viewed 2.24 pages per visit and spent close to 2 minutes viewing each page.

Continued on page 6
Welcome, New and Returning Perlite Institute Members

New Members
The following new regular members recently joined the Perlite Institute. Let’s help welcome them to our membership!

Philippe Leture, Siniat, LePin, France
Haluk Zorlu, Bergama Perlite Mining, Inc., Bergama, Ismir, Turkey

Returning Members
The Perlite Institute would also like to welcome back the following regular members who recently rejoined the organization. Welcome back!

Turgay Comert, Genper Group of Companies, Istanbul, Turkey
Ronald Dobkin, Therm-O-Rock West Inc., Chandler, Ariz.
Craig McKean, The Schundler Company, Edison, N.J.
Bernard Novak, Blue Pacific Minerals, Tokoroa, South Waikato, New Zealand

Yeon Sang Roe
Kyungdong One Co., Ltd.
South Korea
http://en.kdceratech.com/

Please tell us about your business.
Kyungdong One Co., Ltd. has been in business since 1981. We manufacture three types of perlite: open cell, closed cell and balloon. We have 250 employees, and we believe our furnace capacity to be among the biggest in the world. Our customers are primarily from construction, insulation, filtration, horticulture and industrial. We have a very well-organized marketing and sales team that uses various marketing methods to market our business. We have full automated systems of expanding perlite and producing lines for perlite-based products. These automated systems reduce time and costs and save energy.

How has your business changed through the years?
We have experienced many successful years. Our newest insulating product, Hyperlite, has entered the market very successfully. Hyperlite helps insulate pipes with hot fluid to save energy. It is an innovative product, which is more cost effective compared to existing perlite insulation. We are looking forward to experiencing more sales in upcoming years.

Describe your involvement with the Perlite Institute and your hopes for the association in the future.
We have been a member of the Perlite Institute since 1989. We enjoy the newsletter and observing the trends of this industry. We also like the information that only members can access from the website. Although we haven’t been that involved in the organization, we are looking forward to getting more involved in the future. We think the Perlite Institute is working very hard to support the members and the perlite industry. If possible, we would like see information about perlite mines worldwide. We think this would be great information that members would like to see.

If you want your company featured as a Member Profile in an upcoming issue, please email Amy at perliteeditor@hotmail.com.
CRYSTALLINE SILICA and DUST

The public hearing timeframe in the United States regarding OSHA’s revised respirable crystalline silica (RCS) allowable exposure limits has passed. Now we are back in the waiting period to see what will happen. In the meantime, companies such as Dow are getting a marketing jump on the future, trying to market materials with “lower” crystalline silica content, especially for fracking. Dow simply puts a resin coating on the sand, ignoring what could happen if the resin coating is breached.

Regardless of what OSHA does, the EU is tackling the question of what to do about RCS in terms of REACh and CLP requirements. As a naturally occurring mineral product, crystalline silica is exempt from registration requirements. EU countries have various statutory limits on exposure to RCS, so it may fall to the EU to put regulations in place. The following suggestions have been made for labeling of various categories of materials:

- STOT RE 1, if the crystalline silica (fine fraction) concentration is equal to or greater than 10 percent.
- STOT RE 2, if the crystalline silica (fine fraction) concentration is between 1 and 10 percent.
- If the crystalline silica (fine fraction) content in mixtures and substances is below 1 percent, no classification is required. (That would make perlitters happy.)

And, for extra reading, this white paper all but states that RCS is not responsible for lung cancer…unless silicosis has developed first!

Despite all this, reports still appear that breathing perlite is unhealthy. One such report, published in 2013 about a comparison between the residents of the island of Milos and another polluted city on the Greek mainland, has been shown to be inaccurate. That 2013 study, though, continues to pop up. For details on why the study is wrong, see my 2014 annual presentation on the members’ only side of the Perlite Institute website.

Back in my home state of California, efforts continue to make Proposition 65 do what it was intended to do rather than having lawyers extort money out of businesses or scare companies away from doing business in California. OEHHA is asking for public input (by the middle of November) on what they need to do to improve the system. OEHHA is the scientific organization in the state government that, a few years ago, was asking for at least $20,000 to $30,000 to review the case of perlite in a particular consumer-related application. Perhaps there will be action taken for our benefit.

In the meantime, Starbucks is in court in a Proposition 65 case, trying to defend the presence of acrylamide, a “known carcinogen,” in its coffee. Their expert was forced to admit that he knew of no interactions between any of the more than 1,000 chemicals in coffee with acrylamide that would neutralize, enhance or leave alone the carcinogenic effects of that one chemical. I guess that studies showing that coffee is not related to cancer are not specific enough for the law.

GLOBAL WARMING & POLITICS

The next climate change conference likely to produce signed agreements probably will be in late 2015. Indications are that bankers and market professionals are beginning to see opportunities to make money in a low-carbon economy and will push politicians toward those decisions. Economics may be the only way for businesses and environmentalists to agree on an action plan. But then, when money is involved, such as in a cap-and-trade plan, expect squabbles between interested parties to determine how the money is to be spent. Officials in the San Francisco Bay Area are disputing California’s plan to spend revenue...
from the state’s cap-and-trade carbon auction, saying that not enough will be spent there. Mixing politics and money can be a no-win situation.

Interestingly, a website run by two climate change deniers (well, they admit that the climate is changing, but say that it’s only minor and that there’s only a weak correlation between CO2 levels and temperature trends) presents data on plant responses to higher CO2 concentrations. Only limited data is available on various crops, and no data is available on nutrient content or taste. Both of the latter two criteria are pretty much why we eat plants, but have not traditionally been tested in this kind of testing protocol. Enhanced CO2 concentration studies and actual growing regimens are being carried out in greenhouses, where such concentrations can be controlled. The website looks like it adds data as the data becomes available.

**REACH, CLP and GHS**

The European Union has gone beyond airborne occupational exposure limits for chemicals. The EU is working on “derived no effect levels” (Dnels) that take into account oral and skin exposure routes as well. This concept is mainly intended for chemicals, rather than mineral exposure, but questions remain as to what to do with levels of substances such as wood dust, silica and welding fumes.

For example, a German SDS for elemental silicon lists a proposed Dnel of 4 mg/cubic meter of inhalable silicon and 3 mg/cubic meter for respirable silicon. An older US MSDS lists OSHA’s PEL as 15 mg/cubic meter.

**MINE SAFETY**

It “only” took three years, but a gold mining company in North Carolina got a judge to overturn a Mine Safety and Health Administration (MSHA) citation for unsafe equipment. The company shares some land and equipment with a recreational campground and “pan for gold” venture, and the unsafe tractor, only used to cut grass, really belonged to and was only used by the company not regulated by MSHA. Making this a Pyrrhic victory was the fact that the citation was for $121. Now what will MSHA find?

On the other hand, William Hill, the president of a Nevada gypsum mining company, was killed on May 1 of this year when an ATV he was driving rolled over and landed on his neck. MSHA stated that Mr. Hill did not have the experience to operate the ATV in difficult terrain and did not complete a training course as recommended by the manufacturer of the ATV. He was not wearing a helmet or other protective gear.

Mr. Hill had only seven weeks of experience working at the mine and had not received all training required by MSHA. The root cause of the incident was deemed to be that management failed to ensure that the victim, who did not have the experience to operate the ATV in difficult terrain, was provided task training to safely operate the ATV. As Brian Jeppsen explained to us at the Perelite Institute’s 2014 meeting, Murphy doesn’t care who you are: You can be the president of the company or the janitor, but doing something wrong can kill.

About two weeks after the accident, the mine operator submitted a training plan that was approved by MSHA’s district headquarters, effectively “shutting the barn door after the horse has bolted.” MSHA stated that at that time, all persons working at the mine had been provided all required training.

Elsewhere in the world, it appears that financial burdens on coal mining companies in Turkey imposed as “reforms in working conditions” after the Soma disaster in May killed 301 miners have resulted in 37 mines shutting down operations, either temporarily or permanently. The miners’ union estimates that about 5,000 miners have lost their jobs in the one week after the new law took effect. The new law lowered the retirement age to 43, requires bonuses to be paid to miners who stay and limits the work week to 30 hours, instead of 48. Personally, I don’t see how these provisions would make the mines any safer.

The expert report on the Soma disaster revealed that most victims died from carbon monoxide inhalation. Coal had been dumped around an
electrical transformer. When a fire broke out, fresh air met the carbon monoxide and fueled a larger blaze. Support timbers, coal seams, pipes and electrical cables in nearby tunnels also caught fire and added to the toxic gases. Cooling efforts spread the toxic gases further.

Months earlier, high levels of coal gas had been noted in the mine and ignored. Plans to construct emergency exits were at some time canceled. Ventilation projects were not developed even though the number of miners and production quotas had been doubled. Gas masks were not checked, and the mine’s infrastructure was not fire-rated. This type of reform of working conditions would, in my view, be more effective than changing the retirement age.

COMPETITION

Rock wool has encountered two setbacks. The first is economic, in that the UK parent company, Rockwool, had forecast extensive demand for insulation in British buildings. The government, however, cut back funding for the program and will only pay for far fewer installations per year.

The other setback was performance. Scientific studies with rock wool were begun at the University of Giesenheim on green roof applications. Initial tests went well. Water retention was as high as expected. However, midway through the testing, plant growth was shown to be poor compared to standard green roof materials and methods. A 90,000-square-foot green roof at Amsterdam’s International Airport based on rock wool had to be completely renovated in 2012 due to poor performance.

A study of German beers has come out that questions the effectiveness of the filtration process or the cleaning process used to fill the containers. While it is likely that diatomite is used more often than perlite, perlite still plays a role in the filtration of beer. In any case, each of the 24 samples that were purchased at supermarkets contained microplastic contamination. One contained an almost complete insect, and another had a glass shard measuring 600 microns.

Are the microplastics from cosmetics I mentioned in my annual presentation making their way past the brewing process into beer? Are they bypassing the brewing process somehow? Or, are these particles, described as granules, fibers and fragments, due to something else entirely? The whole paper, titled “Synthetic particles as contaminants in German beers,” is available free of charge from Taylor & Francis in .pdf format.

THE ECONOMY

Obviously, the U.S. economy has not deviated from the slow pace seen in the last five-plus years. There has been inflation, in spite of what the government has been saying, but somewhat, for perlites, offset by the cost of energy (natural gas). Much of our industry’s business is tied to housing, either construction or improvement. The housing sector seems to be in a sort of recovery and does not show signs of slowing down at this time. That’s a positive.

World energy demand seems to be growing as well. A recent International Energy Agency forecast for all of 2014 indicates that oil use will grow by 1 million barrels per day versus 2013, accelerating to an additional 1.3 million barrels per day in 2015. Global supply is averaging about 93 million barrels per day, and the inventories are declining. Estimates are that refiners are processing more than 75 million barrels per day.

GREEN BUILDINGS

The American Chemistry Council and the U.S. Green Building Council are getting together to improve LEED v4 after a public squabble over certain details. They have together formed the Supply Chain Optimization Working Group to initially clarify and improve the MRc4 credit involving disclosure of materials and resources. The eventual goals are to inject state-of-the-art safety, sustainability and lifecycle-based approaches into the LEED efficiency standards. From a practical standpoint, the new cooperation allows for a path to return LEED credits for the use of some plastics left out in the initially approved version of LEED v4.

An interesting article explores tracking performance of LEED-certified buildings versus existing building codes and versus older versions of LEED. We also learn the benefits of “enhanced commissioning,” or independent verification of building performance.
BIOFUELS & OTHER SUSTAINABILITY ISSUES

Car batteries are an environmental nightmare. There’s all that lead, some plastic – probably contaminated – and there’s quite a lot of sulfuric acid, too. What if something beyond creating new batteries could be done with them?

Of course, as you might guess, the answer is yes, twice! It turns out that even when the car batteries can’t crank the engine of your sedan, there’s still life in them. They can hold enough charge to power your house when charged during the day by your solar panels. That technology is supposed to be available through car companies within a few years.

Additionally, lead-based (instead of silicon-based) solar cells are being optimized. There’s a mineral crystal structure called perovskite that is well suited for electron transfer. The base mineral does not contain lead, but variations do. Estimates show that a single car battery could provide enough perovskite to create enough half-micron thick solar cells for 30 homes.

The filter tips from cigarettes are another environmental problem. But, yes, once again, word comes (from the World Class University (WCU) program of Chemical Convergence for Energy & Environment, School of Chemical and Biological Engineering, College of Engineering, Seoul National University, South Korea) that there might be a solution. Pyrolysis of those cellulose acetate filters can create an electrical energy storage supercapacitor device. Would the presence of perlite filter aid add to or take away from this ability?

Pyrolysis in a nitrogen atmosphere can also produce biofuel. KIOS in Texas is currently evaluating production of improved biofuel based on non-food plant residues, such as pruning waste or wood chips. The biofuel, as produced, has lower energy content than crude oil, is acidic and contains too much water. However, the energy content can be increased at least 75 percent via the use of a sodium carbonate/alumina catalyst, yielding a material competitive with diesel fuel.

Cesium added to the catalyst cuts the amount of unhealthy volatile aromatic compounds in the fuel. The Texan company is currently producing 4,500 barrels of this fuel per day.

OTHER REGULATORY ISSUES

I devoted much of my annual presentation at the Perlite Institute Annual Meeting in September to water and the Clean Water Act. Now comes word that the U.S. Food and Drug Administration is proposing changes to the Food Safety Modernization Act, hence demonstrating a variation on Newton’s Third Law of Motion: For every regulatory action, there is a political overreaction.

The Food Safety Modernization Act was a response to concerns about nationwide, food-borne illnesses related to spinach, cantaloupes and eggs. The proposed changes would:

- Relax some oversight on irrigation water for farms (allow higher bacterial counts in irrigation water and reduce the frequency of testing).
- Allow easier application of raw manure or compost on farms (quicker harvesting after fertilization).
- Exempt small farms (those with produce sales under $25,000) from produce safety rules.
- Eliminate rules that would have made it difficult for brewers and distillers to give spent grains (and perhaps filter aid) to farmers for animal feed.
- Prevent penalties for wildlife roaming across farms.

The FDA responded to comments from individuals and organizations who objected to mandates for new equipment, increased record-keeping and potentially “over-sanitizing” the farm environment. We will see whether these proposals are also overreactions.

My annual talk also mentioned pharmaceuticals and their metabolites in drinking water. A second area of concern for these chemicals is irrigation water. Dry countries such as Israel and drought-stricken states closer to home have been relying heavily and will continue to rely on treated wastewater as an irrigation source. Studies have shown that for many pharmaceuticals, levels in plants do not generate any concern at this time, but a child eating half a carrot in a day could ingest the equivalent of the Threshold of Toxicological Concern for an anticonvulsant called lamotrigine. More study is recommended.

Until next time, happy expanding! Contact me at k_wiener@hotmail.com if you have any questions.
Innovative Uses of Perlite Explored

by Kenneth Wiener

Fine Perlite the Focus of Many Innovative Applications

This quarter I am reporting on three papers involving concrete, one on plaster, two on green roofs, one on making synthetic zeolites out of “waste” expanded perlite (particle size smaller than 0.4 mm) and one on perlite as a support for a biocatalyst that can clean up hydrocarbon pollution. Notice the emphasis on fine perlite for many of these applications.

Zeolites

Synthetic zeolites can get very expensive and very selective in terms of absorption characteristics. Król, et al. add something to the usual zeolite absorption properties by incorporating perlite’s multi-chambered structure. These researchers used strong solutions of sodium hydroxide at moderately low temperatures (below 100° C) to create the zeolites X, A and Na-P1. Past research has used other chemicals on perlite to create yet other zeolitic structures, but this is the first to concentrate on the use of perlite fines as a starting material.

Underground Mines

As mines are dug deeper, the temperature of the surrounding rock (and hence the mine shafts) increases. The theory behind this usage of perlite is to insulate the mining area from the higher temperatures.

The authors state that they are continuing work started in 1995 by the U.S. Bureau of Mines on shotcrete as an insulating material for underground applications. One positive observation by the authors was that the rebound rate for shotcrete formulations wherein perlite was partially substituted for sand was lower than for standard weight formulations.

In high perlite substitution samples, free perlite was observed as an overspray, hence there is an optimal level of perlite in this application. Thermal conductivity and heat capacity as well as strength values were as expected. Perhaps a comment I heard decades ago that usage of perlite below ground would be as high as that above ground will come to pass. Here, also, a relatively fine perlite aggregate was used (smaller than 10 mesh or 2 mm).

Self-Compacting Concrete

The Bakhtiyari paper presents information on reducing spalling from self-compacting concrete exposed to high temperature. Perlite alone or in combination with zeolite presents a solution to that problem.

The authors propose that pore volume introduced by the perlite reduces the stresses within the concrete at high temperature. They also observed pozzolanic activity by the perlite. Once again, perlite was used as a fine aggregate, with substitution for sands up to 2 mm and up to 5 mm in size.

Calcined Perlite Powder

The authors in this study refer to “calcined perlite powder,” which I interpret as a milled or other fine grade of expanded material. Best results were found with about 5 percent +80 microns (about 200 mesh). In addition to standard testing such as compressive testing, the resistance to chloride ions was investigated.

One of the goals of a pozzolanic addition to Portland cement concrete is to reduce the size and frequency of voids, hence reducing (improving) permeability. It was further disclosed that measuring surface resistivity could reliably predict the rapid chloride permeability and the migration coefficient of concrete.

Continued on page 12
Plaster

The plaster research presented in this paper concludes that the best material they could develop for usages requiring fire protection gave a four-hour rating and consisted of, by volume, 1/3 plaster, 1/3 perlite and 1/3 vermiculite. Being a plaster application, this too did not demand large particles, and so could be a use for fines.

Green Roof Beds 6a, 6b

Testing of input and output water was performed with and without vegetation in the green roof beds. The 6a paper researches the “best” composition of a green roof growth medium in terms of water and air holding, weight and growth. Since the researchers are located in India, sphagnum peat moss was not an option, but coir was considered. Their “optimum” formula contained 30 percent perlite by volume plus 20 percent vermiculite, 20 percent crushed brick, 10 percent sand and 20 percent coir. Then, they considered what happens when it rains.

I’m not sure why their input water was tap water, but the researchers in the 6b paper report on initial leaching of metal ions from the two best-growing medium blends. In both cases, the vegetation they preferred was given as Portulaca grandiflora, a drought-tolerant plant considered to have “fair” survival on green roofs and the potential for metal ion capture. In any case, the amount leached is likely to drop as the green roof ages.

Biocatalyst

The authors of this paper used a very narrow particle size band of perlite: 1.2 to 1.7 mm. This highly uniform particle size range allows for nice particle packing within a biofiltration column, a high degree of flow through the column and a reasonably large area wherein particles touch other particles. Again, note the relatively fine particle size.

Putting the material, both uncoated and coated with the biocatalyst, through an electric field is something that I, at least, would not have thought of. Interestingly, the field killed the sorptive power of bare perlite for hydrocarbons. With the biocatalyst, the field increased the catalyzation ability of the material.

I continue to look forward to reading about and reporting on innovative thinking out there in both the literature and the real world.

References:


Multiple patents are the theme of this fall column. Three more patents were issued to Bayer CropScience on the development of chemicals, this time insecticides and acaricides (tick and mite killers). All three note that if the fungicide is applied to perlite used as a growing medium, only one-third as much is needed. Perlite improves the efficiency of the fungicide that much, and yet that comment is only a side note, not even a claim.

Johnson’s ’847 patent is his second to be approved on the use of perlite in fracking operations. Think of a perlite filter aid particle used not only as a wedge holding grains of sand in a rock crack, but also as a permeability enhancer so that desired flow of hydrocarbons is maintained.

Meanwhile, BASF continued to get patents on the use of perlite as a substrate for their visual effects pigments. The two issued this quarter concentrate on two aspects of this topic: the substrate and the coating. The substrate patent is intended for applications needing a shinier appearance and teaches the removal of fines smaller than 5 microns from the perlite along with ways to produce more planar, two-dimensional flakes. The coating patent teaches ways to use the substrate and is intended for the flakes’ use in inks and such materials.

A small company called CenterStar received two patents on lightweight concrete. Both involve perlite and its use in high-temperature applications for structural concrete, and both patents call for perlite smaller than 100 microns in size (150 mesh). The patents are not clear on whether this is a filter aid grade or a microsphere grade.

A recurring topic seems to be building insulation panels that can be used to retrofit existing structures.

Even if none of the listed patents generate any sales for Perlite Institute members, they keep pushing the boundaries of perlite thinking, production and applications. Thanks for continuing this journey with me.

See Perlite Patents chart on the next page.
<table>
<thead>
<tr>
<th>Patent Number(s)</th>
<th>Date Issued</th>
<th>Inventor(s)</th>
<th>Assignee</th>
<th>Topic</th>
<th>Role of Perlite</th>
<th>Perlite: Innovative/OLD Technology</th>
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<tr>
<td>8,757,422</td>
<td>24-Jun-14</td>
<td>Nishizaki, et al.</td>
<td>Osaka Gas</td>
<td>Cryogenic tank</td>
<td>Insulation</td>
<td>Perlite concrete insulates outer tank</td>
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<td>Kent, et al.</td>
<td>Modular Wetland Sys.</td>
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<td>Particulate removal</td>
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<td>Bujard et al.</td>
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<td>Flake pigments</td>
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<td>Continuation of earlier work</td>
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<td>8,777,467</td>
<td>15-Jul-14</td>
<td>Propst</td>
<td>Propst Family</td>
<td>Building panels</td>
<td>Fireproofing/insulation</td>
<td>Vermiculite &amp; perlite OK</td>
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<td>8,778,863</td>
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<td>Pipko</td>
<td>Caper Naum Vista Olive Oil Market Ltd</td>
<td>Soaps</td>
<td>Substrate, abrasive</td>
<td>Known usage</td>
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<td>8,791,194</td>
<td>29-Jul-14</td>
<td>Johnson, Sr.</td>
<td>Ecopuro</td>
<td>Plastic formulations</td>
<td>Extrusion enhancement</td>
<td>Innovative application</td>
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<td>8,795,428</td>
<td>5-Aug-14</td>
<td>Hill, et al.</td>
<td>Boral Industries</td>
<td>Inorganic polymer compositions</td>
<td>Lightweight aggregate</td>
<td>Suitable substrate</td>
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<td>8,795,429</td>
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<td>Perez-Pena</td>
<td>US Gypsum</td>
<td>Low-temp, lightweight aggregate</td>
<td>High-temp, lightweight aggregate</td>
<td>&quot;Old&quot; technology</td>
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<td>Tetraufl, et al.</td>
<td>Sapturf, LLC</td>
<td>Cooling layer for synthetic turf</td>
<td>Absorbent granule</td>
<td>Also insulative</td>
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<td>8,808,409</td>
<td>19-Aug-14</td>
<td>Banner, et al.</td>
<td>Insta-Fire LLC</td>
<td>Rechargeable fire starter</td>
<td>Absorb fuel</td>
<td>Perlite &amp; vermiculite OK</td>
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<td>8,808,838</td>
<td>19-Aug-14</td>
<td>Haines</td>
<td>-----</td>
<td>Surface coatings</td>
<td>Texturing material</td>
<td>Perlite &amp; pumice OK</td>
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<td>Ecopuro</td>
<td>Hydraulic fracturing</td>
<td>Proppant reinforcing</td>
<td>Helps maintain porosity</td>
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<td>8,820,016</td>
<td>2-Sep-14</td>
<td>Zhou, et al.</td>
<td>Shanghai One Gold Energy Saving Tech.</td>
<td>External building insulation</td>
<td>Insulative filler in board</td>
<td>Essential to the invention</td>
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<td>8,820,027</td>
<td>2-Sep-14</td>
<td>Karimi Aqdam et al.</td>
<td>Easywall Holding Iran</td>
<td>Composite panel</td>
<td>Insulative filler in board</td>
<td>Preferred insulative material</td>
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<td>8,821,629</td>
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<td>Chiappo</td>
<td>-----</td>
<td>Lightweight mortar &amp; stucco</td>
<td>Lightweight filler</td>
<td>Not the only lightweight ingredient in each mix</td>
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<td>8,821,631</td>
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<td>CenterStar, Inc.</td>
<td>Concrete improver</td>
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<td>Hungenberg, et al.</td>
<td>Bayer CropScience</td>
<td>Insecticides, acaricides</td>
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<td>8,832,963</td>
<td>16-Sep-14</td>
<td>Johal</td>
<td>Grain Processing Corp.</td>
<td>Drying spent filter aid</td>
<td>Discusses DE only</td>
<td>Potential soil amendment</td>
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</table>
Industry News

Meet U.S. Geological Survey’s Perlite Commodity Specialist

Shawnna Bennett was recently named as the mineral commodity specialist who deals with perlite for the National Mineral Information Center of the U.S. Geological Survey in Reston, Va. Bennett replaces Wally Bolen, who has moved from perlite to salt and soda ash.

Bennett originally hails from southern New Jersey and now calls Virginia home. She graduated from Rutgers University in 2007 with a B.A. in Chemistry and worked on small molecule drug discovery until entering the U.S. Army in 2009.

In her new position as the perlite commodity specialist at the National Mineral Information Center, Bennett is looking forward to working with the Perlite Institute to highlight new and alternate uses for perlite.

New developments will be highlighted in U.S. Geological Survey (USGS) annual publications, and Bennett will be compiling the data from the annual surveys and reporting the statistics in the annual Mineral Commodity Summaries and Minerals Yearbook.

Click here to access the USGS publications about perlite.

Early Pioneer in Perlite Filter Aids Dies

Ned Vaughan Scott Jr., who was an early pioneer in perlite filter aids and was an active Perlite Institute member for nearly 30 years, passed away Aug. 3 after a gradual decline in health from Alzheimer’s disease. He was 84.

A native of Houston, Texas, Scott spent the majority of his career as a private business owner of Filter Media Company, a producer of expanded perlite. His company was started in the 1960s and was eventually sold to Harborlite in 1996.

Scott was an active member of the Perlite Institute for many years starting in 1963. In addition to serving on the Board of Directors from 1972 through 1976, he also served on the Nominating, Market Development, Filter Aid, Technical and Advertising and Promotion committees. While he was a member of the Filter Aid Committee, the committee’s oversight was expanded to include filter aid and fillers. He chaired this committee from 1974 to 1975.

Scott also acted as an educator and advocate for the Perlite Institute. In 1972, he and three other members published “A Guide for the Bulk Handling of Expanded Perlite.” Members could order a copy of the guide for 25 cents.

In 1973, he worked on a Perlite Institute task force to prepare specifications on Perlite filter aids to be submitted to the federal government for inclusion in the Food Chemicals Codex.

In 1978, he presented a conference on “Marketing Perlite Attic Fill in Fire- Retardant Paper Bags,” and in 1983, he presented a seminar on “Methods to Densify Bulk Perlite Filter Aids” to attendees at the Perlite Institute annual meeting.

Scott, who graduated as a petroleum engineer from the University of Texas at Austin in 1953, served as a Navy lieutenant during the Korean War and remained in the reserve after active service for several years.

He is survived by his second wife, Carol Norwood Scott, and his children from his first marriage, daughter Kathryn Joan Scott and her husband, Wenda Gu, and their daughter, Simone, of Brooklyn, N.Y., and Shanghai, China; son James William Scott and his wife, Alisa, and their sons, Dylan and Christian, of Fredericksburg, Texas; and from his second marriage, daughter Shannon Scott and her partner, Kimberly Wilkins, of Austin, Texas; son Ned Vaughan Scott III and his wife, Callie, and their children, Jackson and Sophia, of Houston, Texas. Click here to read his full obituary.
Technical Q&As

Q: We are applying roofing over perlite insulating concrete and am wondering how much time we should allow for the concrete to cure before beginning the roofing application. Also, do we need a vapor barrier on top of the concrete and under the rigid insulation and roofing? The roof is located in the Baltimore, Maryland, area.

A: During the summertime, when the weather is warm, the normal curing period is 48 to 72 hours for your region. The curing is verified by applying 40# of upward pressure on an anchor in the cement. If the weather is cooler and damp, then curing normally exceeds 72 hours. The test is the determining criteria. Although a vapor barrier is not necessary, it would be suitable with a perlite lightweight insulating concrete.

Q: We are a biodiesel processor that uses diatomaceous earth (DE) as a filter aid in two different steps. DE is great in separating particulates from the oil (we specialize in processing waste vegetable oils), and we have found that the jagged surface area of the DE is also quite useful in capturing moisture. We assume this is because of the relative surface tension of water versus oil and possibly also because of the relative polarity of water versus oil.

We have been reading about expanded perlite and wondering if has similar filter aid properties that it could be used instead of DE. From what we have read, perlite may be able to absorb up to 200 to 600 percent w/w. DE can typically adsorb up to 80 percent w/w moisture, although we have rarely seen it adsorb more than about 50 percent w/w. Do you think we could use perlite instead of DE as a filter aid?

A: It certainly seems like a perlite filter aid would be a good possibility for replacing the existing DE material used in your application. A perlite filter aid should provide a bulkier, lighter wet cake, which should help space out the flocked colloid particles and provide a longer cycle.

When contacting perlite dealers, be sure to send the DE grade designation so they can project what target perlite grade might offset it. In addition, please be sure to have them estimate the distance between the filter leafs as well as the thickness of the cake at the end of the cycle.

There are a number of perlite filter aid producers located around the United States that can provide the names of users with local sources of material.

Q: I am working on a project to design, build and test a machine that can remove perlite from our ASU cold box units. My company wants to remove the perlite from the cold box in such a way that when maintenance is finished the removed perlite can be reused in the cold box. What methods would you suggest for storing the removed perlite so that it stays dry and does not get contaminated?

A: Normally, perlite is removed from cold boxes by vacuuming it out and transferring it to bulk containers for storage or disposal. Once the box has been repaired, the perlite can then be sucked out of the storage units and pumped back into the box. Obviously, some breakdown of the material occurs during the transfers. Therefore, the volume will be less than the original amount, and additional expanded perlite will have to be added to make up the difference. The time needed to remove and replace the perlite depends on the size of the cold box and access to it.

The pumping of the perlite is normally done with pressure pots that operate at ~ 5 PSIG [250 mm hg] and transport the material through a 75- to 100-mm [3- to 4-inch] diameter line with less than 80 M3/hr [500 cfm]. Higher pressures and volumes will result in a lot more breakdown of the particles.

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Want to see more? Have your own question for Chuck Vogelsang, the Perlite Institute’s technical spokesperson? Visit the Perlite Institute Facebook page at http://tinyurl.com/Perlite-Institute-Facebook or the LinkedIn Group at http://tinyurl.com/Perlite-Institute-LinkedIn or email techadvice@perlite.org.
## Selected Upcoming Trade Shows and Meetings

<table>
<thead>
<tr>
<th>Opening Date</th>
<th>Closing Date</th>
<th>Name of Show</th>
<th>Location</th>
<th>Website</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Cities Alive</td>
<td>Omni Hotel and Resort</td>
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<td></td>
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<td>Edmonton EXPO Centre at Northlands</td>
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<td></td>
<td>The BIG Fresno Fairgrounds</td>
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<td></td>
<td></td>
<td></td>
<td>Baltimore Convention Center</td>
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<td></td>
<td>Metro Toronto Convention Centre</td>
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<td>Borgata Hotel Casino &amp; Spa</td>
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<tr>
<td>1/14/2015</td>
<td>1/16/2015</td>
<td>Mid-Atlantic Nursery Trade Show</td>
<td>Baltimore, Md.</td>
<td><a href="http://www.mants.com">www.mants.com</a></td>
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<tr>
<td></td>
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<td>Baltimore Convention Center</td>
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<td>Las Vegas Convention Center</td>
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<td>Newport News Marriott at City Center</td>
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<tr>
<td>1/21/2015</td>
<td>1/23/2015</td>
<td>Tropical Plant Industry Exhibition</td>
<td>Fort Lauderdale, Fla.</td>
<td><a href="http://www.fngla.org/TPIE/">www.fngla.org/TPIE/</a></td>
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<td>Broward County Convention Center</td>
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<td>Drury Lane Conference Center</td>
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<td>2/2/2015</td>
<td>2/6/2015</td>
<td>World of Concrete</td>
<td>Las Vegas, Nev.</td>
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<td></td>
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<td>Las Vegas Convention Center</td>
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<td>Ontario Convention Center</td>
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<td>2/10/2015</td>
<td>2/12/2015</td>
<td>World Ag Expo 2015</td>
<td>Tulare, Calif.</td>
<td><a href="http://www.worldagexpo.com">www.worldagexpo.com</a></td>
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<td>International Agri-Center</td>
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<td>2/18/2015</td>
<td>2/19/2015</td>
<td>National Concrete Masonry Association</td>
<td>San Antonio, Texas</td>
<td><a href="http://www.ncma.org">www.ncma.org</a></td>
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<td>Hyatt Hill Country Resort</td>
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<td>2/24/2015</td>
<td>2/26/2015</td>
<td>Filtech</td>
<td>Cologne, Germany</td>
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<td>Koelnmesse</td>
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<td>Seaport World Trade Center</td>
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<td>3/17/2015</td>
<td>3/19/2015</td>
<td>World of Asphalt (and AGG1 Aggregates Academy &amp; Expo)</td>
<td>Baltimore, Md.</td>
<td><a href="http://www.worldofasphalt.com/about/">www.worldofasphalt.com/about/</a></td>
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<tr>
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<td>Baltimore Convention Center</td>
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<td>Grand Hyatt Melbourne</td>
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<td>San Mateo Event Center</td>
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<td></td>
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<td>Kentucky Expo Center</td>
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</table>
ADVERTISING OPTIONS

ABOUT THE PERLITE INSTITUTE
The Perlite Institute is an international organization founded in 1949. Our mission is to further the success and growth of the perlite industry worldwide by providing its members networking opportunities, education and research; foster customer-driven marketing, promotion and product development; and increase the public’s awareness and knowledge of perlite and its current and potential uses. Members of the Perlite Institute are decision-makers for their companies. If you are looking to reach this industry, you need to advertise with the Perlite Institute!

RIGHTS OF THE PUBLISHER
The Perlite Institute reserves the right to refuse or to edit any advertisement for any reason it deems necessary.

ACCEPTANCE TERMS FOR ADVERTISING
- No implication of endorsement by the Perlite Institute of product or advertisement may be made. The Perlite Institute must approve all ads and placement of the ads.
- The Perlite Institute reserves the right to reject, cancel or remove at any time any advertisement for any reason. In such a case, prompt notice and a prorated refund will be provided.
- These guidelines are intended to provide general guidance. They are not inclusive or exhaustive and are subject to change at the discretion of the Perlite Institute at any time.
- Advertising contract must be used and payment received prior to running advertisement.
- Ads are non-commissionable.
- Net due 10 days. 1% interest charged after 30 days.
- No refunds will be granted for cancellations of advertising after the stated deadline for the publication.

Perlite Today
- Digitally distributed on a quarterly basis to members of the organization.
- Contains editorial features, industry-related articles and items of pertinence to the membership
- Ads available in full color.
- Deadlines: March 7 (For Spring issue)
  June 6 (For Summer issue)
  September 5 (For Fall issue)
  December 5 (For Winter issue)
- File Format: We accept the following file formats: PDF or linked PDF. Formatting needed for both right and left facing.
- Resolution: All file formats must have a minimum of 300 dpi (dot per inch) resolution or greater.
- Fonts: For readability, it is highly suggested no fonts be smaller than 14 pt.
Advertising Contract

Advertiser/Company Name: ____________________________ Date: ____________
Contact Person: ____________________________
Address: ____________________________________________
City: __________________ State: ______ Zip: ______ Country: ____________
Phone: ____________ E-mail: ____________

Perlite Today Ad Size (from chart below) Amount Due

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<th>Member 4x</th>
<th>Non-Member 1x</th>
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<td>$85</td>
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Artwork:  □ Enclosed  □ To follow (e-mail communications@perlite.org) □ Use previous artwork on file

Rates (per issue):

Method of Payment:  □ Check (payable to Perlite Institute)  □ Visa  □ MasterCard  □ Discover

Total Amount Due: $_______
Name on Card: ____________________________
Billing Address: ____________________________
__________________________________________
Credit Card Number: ____________________________
Expiration Date: ____________ 3-Digit Security Code: ____________
Signature: ____________________________

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717-238-9985 (fax)
communications@perlite.org