Jeddah Prime Movers

OFFICIAL NEWSLETTER OF PSME-WRSA JEDDAH CHAPTER

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1ST PLANT TOUR

By:
Engr. Evwin D. Jaradal

On June 2, 2023, we had our 1st Plant Tour at the Saudi Laundry Services in KAEC, Rabigh KSA. The Plant location is about 120km from our Chapter Headquarters where we meet up @ 7:00am.

We were welcomed by the hosts and technical resources speakers: Engr. Mark Roan Abalos and Engr. Sven Eric Van Daele.

As the Plant Tour Director, I conducted a short program before we headed inside their facilities. We were grouped into two, were accompanied, and briefed by Mr. Mark Abalos & Mr. Alex Buan respectively.

After the tour, we returned back to the lecture hall for the question & answer, group discussions and awarding of the Certificates of Appreciation.

Our Membership Director, Engr. Jobert De La Rosa also administered the Oath of Membership to Engr. John John Solam.

Mechanical Engineers: Stand United as Pillars for Economic Transformation Towards Nation's Progress

THANKSGIVING & GET TOGETHER

JEDDAH PRIME MOVERS

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By:
Engr. Jose Melvin D. Santos

Last June 22-23, 2023, we had our "Thanksgiving & Get Together" at a Private Villa in Usfan, KSA. It was a great time to relax to get our well-deserved rest and enjoyment after a fruitful 1st half of PSME-WRSA chapter activities. We had our successful SPLE Review Sessions, SPLE Examinations, and Board Results. The SPLE passers organized a "Thanksgiving & Get Together" attended by the Board of Directors, Past Presidents, and members.

We had a terrific dinner and karaoke night on June 22, 2023. The next day, we prepared and had our breakfast while some also enjoyed soaking in the pools. At 10 am we started the Thanksgiving Program Proper where the RMP Passers namely: Engr. Leonard (Top7), Engr. Ibrahim, Engr. John Ray, Engr. Orlan, Engr. Melchor, Engr. Francis (who also passed RMEE in the Philippines), and me gave their testimonials, and our Past Presidents namely, IPP Nino Jose Lopez, PP Nap Cepriaso, PP Lee Bonifacio, and PP Aldrin Alizon Lango, delivered their Inspirational messages. They gave emphasis on upgrading our competencies to cope up with the global demands of the labor force. We also had "Fun Games", Cutting of the Cake, and the most awaited raffle surprises. At the end of the program, we had our lunch finale together before going back to our respective homes. Indeed, this thanksgiving gave us fun memories to cherish and boosted our energies to even work harder for the next chapter activities lined up for the 2nd half of the year.

Mid-Year Convention & GMM

By:
Engr. Orlan Moriones

As Mahatma Gandhi says that "live as if you will die tomorrow, learn as you will live forever"

This is the inspirational thought that the BOD's of PSME-WRSA Jeddah Chapter had in their mind in serving the General Membership. We recently concluded our 2023 Mid-Year Convention and General Membership Meeting last July 21st at Jiwar Diamond Hotel in Jeddah, Saudi Arabia.

PSME WRSA is a nonprofit organization that relies on sponsorship of individual and other companies. PSME-WRSA Jeddah Chapter had tapped the REZA INVESTMENT Incorporated to be the major sponsor for our event. We made lots of effort in planning thru coordination meetings in order for the 2023 Mid-Year Convention and GMM to be a success.

On that event, we had lot of activities; we had two technical presentation and one product presentation. The first technical presentation was on "DESIGN OF AIR SEAL RING in the STUFFING BOX" by our new member Engr. Jonh John Solam and the second technical presentation was on ''5S TEAM TRAINING'' by Engr. Greg Gulmatico who was former BOD. In 5S Training, which is a Japanese concept we gain knowledge on how we can organize our workplace. Azam Khan a Business development Manager of REZA INVESTMENT presented an Outdoor and Indoor Cleaning Equipment, which gave us knowledge and know how on different cleaning equipment suitable for outdoor and indoor use.

Our speaker, from the Philippines, Engr. Siegfried Sia, 2023 PSME National Secretary set the tone for his Keynote Message, Another Speaker. who was in UAE, Engr. Shayed Mamayog, 2023 VP Middle East delivered his Inspirational Message; and Our Guest of Honor, who was present in the venue, Mr. Wilfredo M. Araza, CPA, PPO-WRSA Vice President.

Three new members were also inducted by Engr. Jobert Dela Rosa, Membership Director as the inducting officer and lastly closing remarks were delivered by yours truly, Engr. Orlan C. Moriones, and Vice President Internal, who thanked everybody who participated on this event.

Engr. Napoleon Cepriaso during Q & A portion after the presentation.

EDITOR'S CORNER

By:
Engr. Gilbert V. Espiritu

Being away from our family is a big sacrifice among OFW and the family itself. We heard a lot of different stories encountered among OFW's in different parts of the world. Some achieved their goals and some failed.

In Saudi Arabia where we are based; having the highest population of OFW in the Middle East and is still the top choice for new OFW because of high employment rate and booming economy.

Having an employment abroad will have a lot of advantage, such as obtaining new skills, work with different nationalities and new cultures, and of course the main reason why we apply for; higher salary. In addition, OFW helps in economic growth of the country through our remittances.

But if there are advantages, there are disadvantages as well. Some if not most of the OFW spend half of their life working overseas sacrificing opportunity to spend time with their family in exchange of providing a better future for their families and good education for their children.

However, some children likewise tend to be more materialistic, addicted to vices and unconcern about the future due to in-adequate guidance from their OFW parents.

OFW is a symbol of courage, sacrifice, and resilience. Their dedication to their families and their country is commendable, and their contributions are immeasurable. As we salute their sacrifices, it is vital that we recognize and support their needs, ensuring their well-being as they continue to help shape the destiny of the country.

An OFW going on vacation at King Abdulaziz International Airport in Jeddah

Cooling Paint: Is it a Potential electricity-free cooling?

Technical Article

By:
Engr. John Ray O. Madla

The underlying principle that makes this possible is the fact that all physical objects emit electromagnetic radiation and body temperature, room temperature and the temperature of the world around us that energy peaks at around 10 microns or 10,000 nanometers in the infrared spectrum.

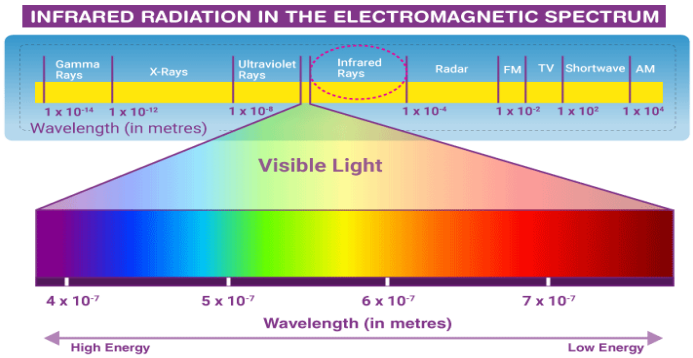


Figure 1. Electromagnetic Spectrum

The efficiency with which any actual physical surface emits that radiation is called the emissivity and typical materials like skin, cloth, wood, concrete, plastic, and commercial paints all emit with an efficiency between about 75 and 90% but to make this work we want that number as high as possible at the same time we need a coating to reject or reflect as much of the sun's light as possible because the sun can dump as much as a kilowatt under every square meter of surface exposed to it.

Metal	Emissivity	Non-metal	Emissivity
Bare aluminum	0.02–0.4	Concrete (rough)	0.93–0.96
Gold	0.02–0.37	Glass	0.76–0.94
Copper	0.02–0.74	Wood	0.8–0.95
Lead	0.06–0.63	Carbon	0.96
Brass	0.03–0.61	Human skin	0.98
Nickel	0.05–0.46	Paper	0.7–0.95
Steel	0.07–0.85	Plastic	0.8–0.95
Tin	0.04–0.08	Rubber	0.86–0.94
Silver	0.01–0.07	Water	0.67–0.96
Zinc	0.02–0.28	Sand	0.76–0.9

Fig.2 Emissivity Table

Now there are a number of materials that will perform either function pretty well, but it tends to be mutually exclusive. It's been known for years how to manufacture surfaces that will do both functions at the same time quite well using multi-layer dielectric films like you're building a laser optics but they require multi-million-dollar laboratory style chemical vapor deposition equipment and the throughput the processing speed is quite slow it really isn't practical. So, there's been a lot of recent interest focused on this one material that performs both functions better than any other known substance, it's widely available, non-toxic, and it's cheap. Barium sulfate it is mined all over the world at about 10 million tons per year as a mineral called Baryte (barite or barytes). It is relatively inexpensive and available in large quantities. It is also non-toxic and environmentally friendly. This makes it an ideal candidate for a solar-reflective coating. In addition, it can withstand extreme temperatures and is resistant to corrosion. This makes it an ideal material for coatings on solar panels and automobiles.

Fig.3.Baryte

Fig.4 Barium Sulfate

It looks a lot like quartz, and it's often contaminated with other minerals so can have various hues from pinks to blues to greens it's pretty but in its pure form barium sulfate is absolutely colorless and is clear as the purest water.

In addition, it's non-toxic for decades gastroenterologists and radiologists have prepared milkshakes containing barium sulfate. The patient drinks the milkshake and coat the inner lining of the GI tract and because barium has such a high atomic weight it's radio-opaque so even with conventional flat plate x-rays the barium sulfate will coat the inner lining of the GI tract outlining the morphology that can show tumors diverticula ulcers it's literally safe to drink.

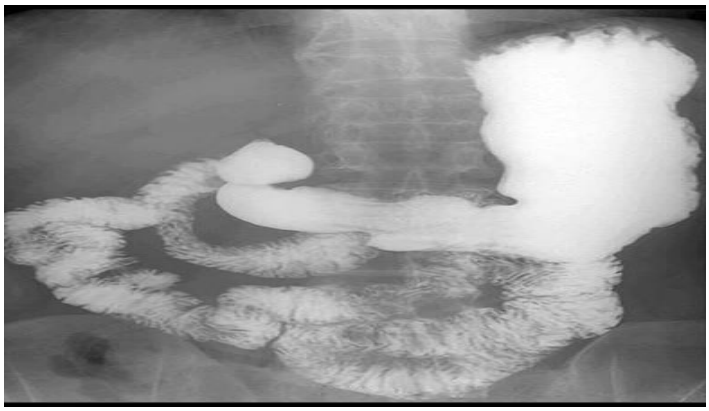


Fig. 5 X-ray after taking Barium Sulfate

For our purposes however, what is important is that the barium sulfate crystal has an electronic structure that allows it to resonate at the same frequency as the thermal vibrations that occur around room temperature and so each of the crystals operates that emits that radiation into the environment at an over 96% efficiency at the same time what makes it so reflective in the visible is the fact that it is so clear.

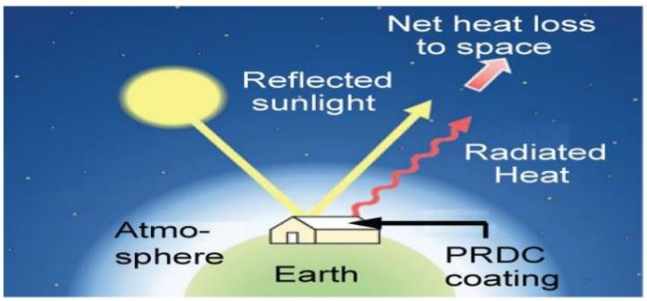
And it's the same principle that makes pure water the second most reflective material known when it is converted into snow when light strikes a snowflake or crystal of barium sulfate some of the light reflects off the surface of the crystal and is scattered away some of the light enters the crystals and is refracted and again scattered away. The light that is scattered back toward the source we call the reflection but the light that is scattered deeper into the material simply encounters other crystals where the process repeats over and over again and because both substances are so clear they don't absorb the light. This process is virtually lossless it just continues to bleed away light toward the source until eventually all of it is gone.

Pure barium sulfate powder has a reflectivity in the visible of over 99%. And potentially can be turned into paint that is capable of **sub-ambient radiant cooling** basically this paint could provide **passive electricity-free air conditioning** by sucking heat from its surroundings and hurling it into space as infrared radiation. As unbelievable as that sounds there's a stack of published research documenting radiant paints that.

can reach temperatures as much as 10° C lower than the surrounding air temperature there are a few different ways these paints have been made in the lab.

White paints typically reflect only about 80% of visible light, and they still absorb ultraviolet (UV) and near-infrared (near-IR) rays, which warm buildings. barium sulfate ($BaSO_4$) has a high electron bandgap for low solar absorptance and phonon resonance at 9 μm for high sky window emissivity. With an appropriate particle size and a broad particle size distribution, $BaSO_4$ nanoparticle film reaches an ultra-high solar reflectance of 97.6% and high sky window emissivity of 0.96.

Passive Daytime Radiative Cooling (PDRC)



Is an electricity-free method for cooling terrestrial entities. In PDRC, a surface has a solar reflectance of nearly 1 to avoid solar heating, and high emittance close to 1 in the long wavelength infrared (LWIR) transparent window of the atmosphere (wavelength l = 8- 13 micrometer) for radiating heat to the cold sky. This allows the surface to passively achieve sub-ambient cooling. It reduces space cooling cost, combat the urban island effect and alleviate the global warming.

Is it a potential electricity-free cooling?

Yes, Using Planck's Law (also known as Planck Radiation Law) to explain the spectral-energy distribution of radiation emitted by a blackbody (a hypothetical body that completely absorbs all radiant energy falling upon it, reaches some equilibrium temperature, and then reemits that energy as quickly as it absorbs it). And with the availability of nontoxic and cheap barium sulfates, a proper mix of solvent and resin to bind the paint. A thick coating enough to scatter the reflected light back to the source rather than get through and be absorbed.

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How to become a PME?

By:
Engr. Julius Caneca

Becoming a PME will be the greatest achievement once a person graduates for Bachelor of Science in Mechanical Engineering course. This is a manifestation of hard work and experiences in the field of mechanical engineering and the highlights of one's career in this field. This widens the scope of work, obligations, and the responsibilities, but of course this will mean a better opportunity for career advancement. Before that, we must know "How to become a PME?".

Like other advancement, there must be requirements and procedures as well as guidelines and stages. Which are the main reasons for the PSME WRSA JC providing write shops to all aspiring PME candidates. This will not be possible without the help of our past presidents and mentors Engr. Crisostomo Ortiz (PME) and Engr. Napoleon Cepriaso (PME).

The write shop was very beneficial for all the aspirants. We've learned that this was not an easy process which will take lots of effort, time, and financial aspects. Aside from the 2 Title of the case study that well be presented to the Board of Mechanical Engineer's, must have the following documents as well like NBI, detailed and comprehensive CV's, work experiences and competencies, and others. The meeting was attended by 8 PME aspirants which are everyone is looking forward to submitting their documents for review and mentoring. The write shop was very successful and full of useful information that will guide the aspirants in making their individual paper works. This helps them to prepare not only mentally and emotionally but also what to expect during the process. The meeting was concluded with very delicious, dried noodles with sweet and well blended biko for the dessert and refreshing cold soda.

Are you ready to become PME?

Certificate of appreciation was given to Engr. Napoleon Cepriaso and Engr. Crisostomo Ortiz for their valued effort in guiding our PME aspirant.

CREED

We, the Mechanical Engineers of the Philippines, conscious of our responsibilities to God, our country and fellowmen. Affirming our adherence to the Code of Ethics for Mechanical Engineers. Desirous in participating and contributing in the social, economic, and industrial growth of our country. Determined to support one organization that shall embrace the Mechanical Engineering profession. Have resolve to unite to accomplish these aims by constituting a national organization of Mechanical Engineers