FOCUSING ON ADVANCED PM MANUFACTURING METHODS

Grand Prize recipients from the MPIF Design Excellence Awards. (Courtesy: MPIF)

MPIF offers three dynamic powder metallurgy conferences in Orlando designed to attract the world's leading industrial-technical minds from more than 30 countries.

By JAMES P. ADAMS

Times and conditions change so rapidly that we must keep our aim constantly focused on the future." — Walt Disney

How appropriate. Over the years, the Metal Powder Industries Federation (MPIF) and APMI International sponsored conferences and exhibits have become the largest and most prestigious conferences in the powder metallurgy (PM) industry. This year, MPIF and APMI welcome the global PM industry both in-person at Orlando's Walt Disney World Swan and Dolphin Resort and virtually, June 20-23. Disney's focus was to build a home for Mickey Mouse and his other magical creations, but MPIF and APMI will focus on the future of manufacturing using metal powders.

The future of manufacturing requires a sustainable process from cradle to grave. Sustainability is a far broader concept than just quality, the environment, energy, or recycling. It is the sum of all those things and their impact on employees, communities, and customers. The U.S. Department of Commerce defines sustainable manufacturing as "the creation of manufactured products that use processes that are non-polluting, conserve energy and natural resources, and that are economically sound and safe for employees, communities, and consumers." Imagination and deployment of the fabrication and processing capabilities of PM bode well for technology in the future. Starting with recycled metal and uncommon metallurgical and mechanical ingenuity, the use of PM as an energy-efficient and eco-friendly metal-forming technology should enable it to continue to exhibit its intrinsically sustainable advantages and benefits to the world for its use in the future.

2019 Poster presentations. (Courtesy: MPIF)

The three big conferences with one registration fee will attract the world's leading industry-technical minds promoting PM technology advancements from more than 30 countries. Delegates will transfer knowledge as they attend technical sessions, special-interest programs, and view the international poster display, in-person and online. The 100-booth marketplace exhibition will showcase leading suppliers of powder metallurgy and particulate materials processing equipment, powders, and products — one stop shopping for all. Special events include a keynote presentation by Edwin Pope, Principal Analyst, IHS Markit; the State of the North American PM Industry; the PM Design Excellence Awards featuring recipients of the 2021 awards; and the Great American BBQ closing event.

POWDERMET2021

The entire PM industry will converge in June at PowderMet2021 — the International Conference on Powder Metallurgy & Particulate Materials. In addition, there are two co-located conferences: Additive Manufacturing with Powder Metallurgy (AMPM2021) and the International Conference on Tungsten, Refractory & Hardmaterials (Tungsten2021). The marriage of these conferences was inevitable. All three conferences focus on advanced manufacturing methods that have high-material utilization rates, relatively low-energy consumption, use recycled materials where possible, and provide a good work environment for employees while being economically responsible for shareholders. In many cases, no other manufacturing method is practical to produce these components.

AUTOMOTIVE INDUSTRY UPDATE

The keynote presentation will provide key information from the automotive industry. From market-level volume impacts to powertrain and electrification trends, the outlook of the automotive industry and the potential cascading effects are numerous to the powder metal supply chain. Outlooks and trends discussed will include: global automotive market, propulsion system design, transmission design, electrification, and metal 3D printing within the automotive sector.

MPIF is proud to celebrate its 57th year of the PM Design Excellence Award Competition program. The competition provides PM parts fabricators an opportunity to showcase the advantages of PM. The competition is divided into three major technology catego-

2019 Technical Session presentation. (Courtesy: MPIF)

ries: conventional powder metallurgy, metal injection molding, and metal additive manufacturing. Subcategories include automotive, aerospace, lawn and garden, hand tools, industrial motors, hardware, medical, and electronics.

TECHNOLOGY TRANSFER

PowderMet2021 is a hub for technology transfer for professionals from every part of the industry, including buyers and specifiers of metal powders, tooling and compacting presses, sintering furnaces, furnace belts, powder handling and blending equipment, quality-control and automation equipment, particle-size and powder-characterization equipment, consulting and research services, and much more. Multiple technical sessions will take place concurrently. The special interest programs — oral presentations on cutting-edge R&D — will include discussions on improving precision, accuracy, and variation; characterizing powder flow and spreadability; and the Alan Lawley Memorial Symposium based on the outgrowth of research performed by one of the pioneers of atomization.

Focusing on metal additive manufacturing (AM), or 3D printing, AMPM2021 will feature worldwide industry experts presenting the latest technology developments in this fast-growing field. This conference is the only metal-specific AM conference in North America. Metal AM is a process of making three-dimensional solid objects by adding successive layers of material rather than by removing material, as is common in conventional methods such as cutting or drilling; 90 presentations from global industry experts from 15 countries make this a truly international collaboration of the latest industry developments. Presentations will include the perspective of metal-powder producers, toll providers and end user of these processes, R&D programs from academia and consortiums, and equipment manufacturers. Topics include materials, processes, technical advances and barriers, and applications.

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TUNGSTEN 2021

Tungsten 2021, the 10th International Conference on Tungsten, Refractory & Hardmaterials will showcase numerous developments that have taken place over the past seven years. One of the most notable has been the explosive development of AM using refractory metals and alloys and their carbides. There also has been a notable initiative, driven by concerns for environment, safety, and health (ESH), toward the development of cobalt-free carbide and alloy com-

2019 Exhibit Hall. (Courtesy: MPIF)

positions. Significant growth in the interest of field-assisted sintering technology (also called spark plasma sintering) of refractory metals and carbides has been witnessed during this period. Further, there has been advancement in the particle deposition method called cold spray for refractory materials. Interest in nanocrystalline materials remains high, and there have been several interesting developments in nano-phase refractory metals and alloys.

The National Science Foundation (NSF), CPMT/Axel Madsen, and MPIF Conference Grants provide students with the opportunity to participate and exchange ideas with leading researchers and engineers from worldwide industry and governmental facilities, as well as the students and faculty from both domestic and international universities. The recipients attend the full conference, giving them the chance to learn the latest research areas and results in PM fields of interest. These opportunities will not only improve the students' knowledge in the field, but they will also develop scientists and engineers who are ideally suited to create the next generation of designs in PM and metal AM that will push materials and manufacturing capabilities. Conference grants were awarded to 49 students this year from 25 universities. The students will present ongoing R&D at their universities through presentations and posters.

SUSTAINABLE SOLUTIONS

There are unlimited opportunities for metal powders. Some of the most interesting research relates to sustainable solutions for our planet. One of the ongoing energy projects uses iron powder as an energy source. When iron powder is combusted with hot gases to drive an engine, the result is rust. The oxygen is extracted from the rust particles using hydrogen produced from sustainable electricity surpluses to turn it into iron powder again, and the process repeats.

Another energy-focused project is a new infrastructure for storing zero-emission metal-hydride energy. This innovative, safe, and compact all-in-one renewable energy storage solution uses a metal alloy powder from hydrides. High-density PM pellets of the alloy are an efficient solid-state storage material for hydrogen gas, resulting in smaller tanks, operating at lower pressure and temperature, helping drive the global energy transition.

Other non-traditional applications for metal powders include water purification. Not only is this of great benefit to community water sources, but it is also a humanitarian effort for developing countries that need to remove multiple contaminants from groundwater and drinking water in a single step.

Don't miss the opportunity to learn how metal powders and PM can be your metal-working solution. Join the PM industry in Orlando or online June 20-23. To learn more about this event, go to PowderMet2021.org, AMPM2021.org, or Tungsten2021.org.

ABOUT THE AUTHOR

James P. Adams is executive director/CEO for the Metal Powder Industries Federation and APMI International, also serving as secretary/treasurer for the Center for Powder Metallurgy Technology. Adams joined MPIF in 2004 and has held a variety of managerial positions before being named executive director/CEO in 2017. He was instrumental in the founding of the Association for Metal Additive Manufacturing. He has worked in the PM industry since 1985.