ThaiPMA 2020 Activities

Update Situation
Due to COVID-19, ThaiPMA decided to postpone the physical event in 2020. However, we are still working on our main purpose to promote PM industry in Thailand.

Activities 2020-1 PM School Training at end-user
- On 15 April 2020
- At Toyota Daihatsu Engineering and Manufacturing
- On-site training and in-situ teleconference
- Totally 10 participants from TDEM
- Mr. Bhanu, and Mr. Tharanon as the Speaker from ThaiPMA

PM Training-Photos

Activities 2020-2 Online PM School
- From 18-19 June 2020
- Teleconference to company site (Thai carbon and graphite – TCG) due to Covid-19 incident.
- Totally 25 participants from TCG participate this training
- Mr. Tharanon and Ms. Palida as the speaker from ThaiPMA

Activities 2020-3 In-house PM School
- On 23 and 30 June 2020
- PM Training(Teleconference)-Photos
- On-site training with metallography training with TDEM lab equipment
- 4 participants join the training.

PM Training-Photos

Activities 2020-4 Metallography Training at End-user
- On 22 and 25 September 2020
- At Toyota Daihatsu Engineering and Manufacturing (TDEM)
- On-site training and on-line teleconference
- 4 participants join the training.

Activities 2020-5 PM Handbook in Thai language
- Published the PM Handbook from Asst. Dr. Sarum at Suranaree University of Technology (SUT).
- The team of three people including Dr. Sarum, Mr. Bhanu, and Mr. Tharanon were selected as the editor from ThaiPMA.
- The 400-page handbook was published in November 2020.
- Now available at Book store.

PM Training-Teleconference-Photos

Activities 2020-6 Metallography Training in Thai language
- On 22 and 25 September 2020
- Metallography Training-Photos
- 4 participants join the training.

PM Training-Teleconference-Photos

Planned Activities 2021
- Create online learning material for PM School
- 3 x In-house PM School at PM companies (upon request)
- 1 x Metallography School
- ThaiPMA-AM/PM Award
- 3 x Board meeting for member

Powder Metallurgy Handbook: Photos

The impact of the new coronavirus is far beyond our prediction and understanding. After a year of hard work, although countries have begun to introduce a vaccine, the mutation and infection rate of the virus are still not known. We have to speed up our pace and work together to tide over the difficulties.

I am very happy to see that APMA members are still committed to exchanges and information sharing in PM as usual. In August of 2020, we started to cooperate with MPIF and EPMA to establish a database about PM and update it regularly (https://www.apma.com/members-directory or https://my.mpif.org/MPIF/directory). Users can learn much more about technical information through this platform. In the future, we will also assist in the integration of corporate information to make the usefulness of PM wider and deeper.

In addition, Taiwan Powder and Powder Metallurgy Association will be celebrating the 40th anniversary this year, and the association has begun various preparations for celebration. The celebration meeting will be scheduled for Oct. 15 and 16, 2021. It is hoped that the epidemic will slow down by then, business activities resume, and I can meet you in Taiwan to reminisce about the past!
Our activities in 2020 were severely restricted by COVID-19 like any other associations. Most activities have changed from real to virtual.

Annual Meeting
We hold the Spring Meeting and the Autumn Meeting every year. Last spring meeting was scheduled to hold in Waseda University in May. Unfortunately, it had been cancelled it by COVID-19.

In the autumn meeting case, an online meeting was held in October from 27th to 29th. The number of presentations is 159. The methods of presentation are the on-demand video presentation, the on-demand slide presentation, and the presentation only with the abstract pdf.

On-demand presentations may have some troubles. They may be captured, copied by recording, downloaded, and so on, in cases of the on-demand videos and slides. Although various prevention functions are added, these captures cannot be completely prevented. We only relied on the morals of the participants. Participants have some good opinions. They can watch videos and slides at their own pace. They can use their time effectively. Some people said that they can see the materials on the PC better than the actual venue screen.

But it was difficult to make the Q&A between the presenter and the participant.

Power Metallurgy Seminar
Every year, we hold “Power Metallurgy Seminar”. It is consisted of “Introduction”, “Basic”, and “Application”. There contain 4 lectures, respectively.

In 2019, we held 3 seminars in the real venue. However, due to the covid-19 in 2020, all these three seminars were held in a hybrid form, with participants selecting to be in the venue or to attend in an on-line form. So, we prepared 2 ways to attend the seminar through the web or at the real venue, in so called hybrid way. More than half of the participants attended through the web. We received the questions from both participants in the venue and on line. Q & A in the seminar have been done very smoothly. We expect the participants had deep understandings of powder metallurgy.

Journal of the Japan Society of Power and Powder Metallurgy
We published the monthly journal, volume 67. The 66 papers were published in our journal in 2020. Some following special issues were planned, “Control and Manipulation of Microstructure in Magnetic Materials for Functional Devices”, “New Development of Powder Processing under Eternal Flashes”, “High-performance Electronic Components and Materials for Smart Societies”, “Additive Manufacturing 3D Printing Technology and HIP/CIP”, and “Progress of Engineering and Research for Future Development of Hard Materials”. Journal of JSPM is published on the official website of J-STAGE (https://www.jstage.jst.go.jp/browse/jjspm). Everyone can read all the abstracts and references. However, only our members can read all the PDF files of the papers using ID and PW within 6 months after publications.
2020 Activities

A 16\textsuperscript{th} ISNNM-2020 (International Symposium on Nano and Novel Materials) was held at Phoenix Jeju in Jeju from November 3 to 6. The ISNNM-2020 is an International Conference organized by KPMI(Korean Powder Metallurgy Institute). It was first started in Korea in 2007 and is held every 2 years. A 16\textsuperscript{th} ISNNM-2020 was organized by KPMI and co-hosted by TU Wien, Austria and Institute of Metallurgy & Materials Science, Poland. The event was originally scheduled to take place in TU Wien, Austria in early July 2020, but was canceled in Austria due to global pandemic of Covid-19. So, the event was canceled in Austria. The 16\textsuperscript{th} ISNNM-2020 was held Incorporating with the 54\textsuperscript{th} Conference of Korean Powder Metallurgy Institute from November 3 to 6, 2020 at Jeju, Korea.

16\textsuperscript{th} International Symposium on Novel and Nano Materials
Incorporating the Fall Conference of Korean Powder Metallurgy Institute
Period : Phoenix Jeju, Korea
Venue : 3-6 November, 2020

2021 Activities
Korean Powder Metallurgy Institute Spring Conference
Period : 1-2 April, 2021
Venue : Yeosu Expo Convention Center, Yeosu , Korea

3\textsuperscript{rd} International Symposium on Innovation in Materials Processing
Incorporating the Fall Conference of Korean Powder Metallurgy Institute
Period : ICC Jeju, Korea
Venue : 2-5 November 2021

The new activities scheduled in 2021

<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Conference Name</th>
<th>Scale(Number of people)</th>
<th>Conference Date</th>
<th>Host City</th>
<th>Main Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Domestic academic exchange</td>
<td>The Sixth Conference on special powder metallurgy and composite material preparation / processing</td>
<td>&gt; 300</td>
<td>2021/11</td>
<td>To be determined</td>
<td>In the conference, the developments and achievements of the special Powder Metallurgy and composite materials will be presented and discussed, the advanced production processing will be summed, some typical living cases will be presented and compared. It aims to improve the production and processing of nonferrous metal and composite materials.</td>
</tr>
<tr>
<td>2</td>
<td>Domestic academic exchange</td>
<td>2021 national powder metallurgy conference and 2021 coastal powder metallurgy technology seminar</td>
<td>&gt; 1000</td>
<td>2021/7-2021/8</td>
<td>Changsha, Hunan</td>
<td>This conference aims to help the communication and cooperation between researchers working on Powder Metallurgy, and promote the future development of Powder Metallurgy industry in China.</td>
</tr>
</tbody>
</table>
In 2020, the TPMA annual general membership meeting was held on September 3rd at the Industrial Technology Research Institute in Hsinchu. Several awards, including the Outstanding Paper Award, Excellent Staff Award, Innovation Award, and Association Scholarships, were awarded at the annual meeting. Two keynote speakers were invited to present their significant talks. The first keynote speech, entitled “The Effects of Global Supply Chain Restructuring on the Key Industries Strategy in Taiwan—Taking Metal Products as an Example”, was presented by Dr. Ko-Hsiung Lien, Director of the Research Division VIII at the Taiwan Institute of Economic Research. The second keynote speech, entitled “Solar Applied Materials Technology Corporation—Green Supply Chain Localization”, was presented by Dr. Chien-Yung Ma, Chairman of the Solar Applied Materials Technology Corporation.

The TPMA board members visited the Solar Applied Materials Technology Corporation on November 17th, and a board meeting was held in a conference room there. Furthermore, TPMA and the Industrial Technology Research Institute co-organized three seminars in 2020. The three seminars were “Workshop on Intelligent Platforms for Powder Metallurgy Processes”, “Seminar on Advanced Aluminum Alloy Composite Powders and Application Technology”, and “Workshop on PM Digital Additive Manufacturing Technology Platforms”.

In 2021, TPMA will hold the 40th anniversary and annual general membership meeting in October. A cross-strait PM conference will also be held in October. A four-day short-term course on powder metallurgy “Powder Metallurgy Short-Course (PMSC20)” took place from 26-29 September 2020 in the virtual mode and governed through Department of Metallurgy and Materials Science, College of Engineering Pune Campus. The program was organized by PMI in collaboration with Department of Metallurgy & Materials Science College of Engineering Pune, Dr. S.P.Butesh, Co-Convener and HiD Metallurgical Engineering COEP welcomed the participants and briefed about workshop. He also introduced various activities and happenings of the department to the people present in the inauguration. Mr Anil Gore, President, Powder Metallurgy Association of India gave introduction about PMI and the activities housed under the flag. Dr. Vaishali Poddar gave instructions for online mode of communication during PMSC 20 and later Dr. S.P.Butesh proposed vote of thanks. Invited talks covered various aspects of powder metallurgical technology. The multiple invited talks were delivered by eminent speakers and covered various powder metallurgy and its application related topics as tabulated in Table 1.

### Table 1: Topics of the invited talks covered by various speakers at PMSC 20.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Topic</th>
<th>Name of the Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Powder Metallurgy and Particulate Materials Technology</td>
<td>N.L. Chandrachud, Consultant</td>
</tr>
<tr>
<td>2</td>
<td>High Density, High Performance PM Materials Processing</td>
<td>N.L. Chandrachud, Consultant</td>
</tr>
<tr>
<td>3</td>
<td>Thermal Methods of Powder Production for PM</td>
<td>Dr. T. Mahata, BARC</td>
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<tr>
<td>4</td>
<td>Mechanical and Solution Methods of Powder Production for PM</td>
<td>Dr. K. Murti Gopal, Novoken Innovations</td>
</tr>
<tr>
<td>5</td>
<td>PM Porous Materials</td>
<td>Dr. K. Murti Gopal, Novoken Innovations</td>
</tr>
<tr>
<td>6</td>
<td>Manufacturing Techniques for Commercial Iron Powders</td>
<td>M. Nipankar, Hoganas India</td>
</tr>
<tr>
<td>7</td>
<td>Powder Characterization</td>
<td>Prof.P.Ramakrishnan, Emeritus Professor, STB</td>
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<tr>
<td>8</td>
<td>Maintaining Quality in PM Manufacturing</td>
<td>Raghendra Sethya, GRN</td>
</tr>
<tr>
<td>9</td>
<td>Design and fabrication of Tooling for PM</td>
<td>Sanjay Raising, Consultant</td>
</tr>
<tr>
<td>10</td>
<td>Furnaces for sintering &amp; heat treatment</td>
<td>N. Gopinath, Fluidtherm</td>
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<tr>
<td>11</td>
<td>Metal Injection Molding</td>
<td>Prof Parag Bhalrava, IIT B</td>
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<tr>
<td>12</td>
<td>Consolidation of Powders, Binders, Lubricants &amp; Sintering Aids</td>
<td>Dr. Syam Babu, BARC</td>
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<tr>
<td>13</td>
<td>Sintering of Some Commercial Ceramics</td>
<td>Dr. Rama Mohan Talapragada, BARC</td>
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<tr>
<td>14</td>
<td>Fabrication / Shaping Methods for Advanced Ceramics and Composites</td>
<td>Dr. Deep Prakash, BARC</td>
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<tr>
<td>15</td>
<td>PM parts Heat Treatment</td>
<td>Dr. N.B. Dhoksi, CoEP</td>
</tr>
<tr>
<td>16</td>
<td>Thermal Consolidation of Powders—Sintering Fundamentals</td>
<td>Dr. N.B. Dhoksi, CoEP</td>
</tr>
<tr>
<td>17</td>
<td>Powder metallurgy of Bulk Metallic glass Composites</td>
<td>Dr.Bharak Ram Murmad, DMRL</td>
</tr>
<tr>
<td>18</td>
<td>Bond Matrices in Diamond Cutting Tools</td>
<td>Dr. Vivek Shingal, Sharp Diamond</td>
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<tr>
<td>19</td>
<td>Friction Materials</td>
<td>Dr. Malobika Kamarja, APICI</td>
</tr>
<tr>
<td>20</td>
<td>Biometals</td>
<td>Dr. Malobika Kamarja, APICI</td>
</tr>
<tr>
<td>21</td>
<td>Tungsten Alloys in Defence and Aerospace Industry</td>
<td>Mr. Biren Sara, Consultant</td>
</tr>
<tr>
<td>22</td>
<td>Overview of PM Standards</td>
<td>Dr. V. S. Poddar, COEP</td>
</tr>
</tbody>
</table>

Each session comprised of dedicated discussions, challenges and opportunities in powder metal logy technology development. Overall there were about 17 participants attended this course which were drawn from diverse industries viz. Heavy Alloy Penetrator Project, Trichy, Godrej & Boyce Mfg. Co. Ltd., Federal Mogul, Tirupati, Yogiwehkar Engineering, Danfoss Power Solution India Pvt. Ltd., Sintercor India Limited, Ahot Specialties, Sarda Metal Powders, PP Pakal and Company. The course feedback was collected from all the participants and the overall rating for the course came out to be 4.1 out of 5. Few suggestions were given by the participants to further improve the course effectiveness viz. case studies related to PM to be discussed in more details, elaborate information on basic set up needs of PM related functioning, and information about tolerancing practices in case of as sintered components having different geometries. Also, based on the courses taught, online examinations in between the talks were conducted and participants had responded very well to this.