

Editorial

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In this Issue

- PM 10
- World PM News
- Prize Winning PM Components
- PM Short Term Course
- Forthcoming PM Events
- PM Workshop
- About PMAI Members
- Company Profile
Mitsubishi Materials Techno Corporation

36th Annual Technical Meeting of PMAI along with an International Conference and Exhibition on Powder Metallurgy Processing of Particulate Materials and Products will be held at Jaipur, during 28 to 30, Jan. 2010. Major consumers of powder metallurgy products are the auto industry and it is General Motor, U.S.A., in 1930 used iron powder as a cheaper substitute for the expensive copper tin powders for the manufacture of porous self lubricating bearings. It is unfortunate that this auto major filed for chapter 11 bankruptcy protection on June 1, 2009. But it is heartening to note that GM's Indian operation is doing well & also India's prestigious Nano Car for Rs. 1 Lakh of Tata Motors was released on 17th July in Mumbai. The MPIF, U.S.A.; International Conference at Las Vegas during June 27 to 1st July 2009, reported the decline in the current auto production and its impact on the reduction of metal powder production during 2008 as well as in the first half of 2009. Mark C. Paulin, president of MPIF is optimistic about the long term opportunities of powder metallurgy which is reported in this issue along with some of the award winning PM products. Another important PM event is the 17th. Plansee Seminar, the world's largest conference on High Performance Refractory Metals and Hard Materials which took place in Reutte, Austria during May 25 to 29, 2009. Also reported in this issue PMAI --PM Short Term Course; PM Workshop on Plant Practice and the sponsor company profile TAMAGAWA, Japan.

P.Ramakrishnan

INTERNATIONAL CONFERENCE & EXHIBITION

On Powder Metallurgy in Processing of Particulate Materials and Products
& 36th Annual Technical Meeting

PMAI

Jaipur - 28th to 30th January 2010 | Venue : Sheraton Rajputana Hotel

Organized by : Powder Metallurgy Association of India



Topics

- Powder production and characterization
- Compaction and other forming processes
- Sintering, Hot pressing and Hot isostatic pressing
- Secondary operations
- Hard metals, cermets, structural ceramics, composites & diamond tools
- Refractory metals, Electrical contacts and carbon brushes
- Electrical, Electronic and Magnetic Ceramics & Composites
- Testing and evaluation
- Health, safety and environment
- Energy conservation
- Advances in characterization, testing & process equipments
- Materials and components for aerospace, defence & nuclear applications
- Application of PM parts in electrical, magnetic, automotive, domestic appliances and engineering industries
- Injection moulding and other forming processes
- Nano powders and processing.

For Further Details, Contact Us :

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View Details & Register online with www.pmai.in

Deadlines

Submission of abstracts for oral & poster presentations.....30 Nov. 2009
Preliminary acceptance of abstracts15 Dec. 2009
Final Circular & Programme.....25 Dec. 2009
Submission of final manuscript.....15 Jan 2010

Industrial Workshop

Concurrent industrial workshop will be held as after noon sessions on 28th and 29th and whole day on 30th January 2010. The equipments and techniques for the processing and evaluation of metallic, ceramic, cermet and diamond tool components will be discussed. The talks will be given by specialists from manufacturers.

Speakers from OEM's & Technology Providers are invited to send abstracts related to the following topics

- ◆ Technology Innovations
- ◆ Equipments in Powder Processing and Product Evaluation.
- ◆ Diamond Tools, Diamond Coatings, Hard Metals & Wear Resisting Components.

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World PM News

State of the PM Industry in North America - 2009

Metal Powder Industry Surviving Recession

"We can view the current state of the powder metallurgy (PM) industry through short-term fear-tinted glasses or as long-range opportunities," reported Mark C. Paullin, president of the Metal Powder Industries Federation (MPIF) here during the Powdermet 2009 Conference. "Just like U.S. manufacturing in general, the PM industry has been impacted negatively by the current recession and plunging automotive production."

Beginning on a hopeful note, the PM industry in 2008 weakened in the second half, especially in the final quarter mainly due to a sharp decrease in auto production in November and December. Iron powder production declined 19 percent to 327,272 short tons, copper and copper-based powder shipments declined 13 percent to 17,400 short tons, and stainless steel powder shipments declined about 20 percent to an estimated 7,750 short tons.

North American Metal Powder Shipments

	2007	2008
Iron & Steel	404,650	327,272
Stainless Steel	9,676 (E)	7,750 (E)
Copper & Copper Base	19,992	17,400
Aluminum	50,000 (E)	42,500 (E)
Molybdenum	2,800 (E)	2,000 (E)
Tungsten	4,650 (E)	4,000 (F)
Tungsten Carbide	7,394	5,103
Nickel	9,190 (E)	8,650 (E)
Tin	785	752
(E) estimate	509,137 short tons	415.427 short tons

Reflecting the continuing decrease in auto production, metal powder production declined further during the first half of 2009.

Paullin stressed that the PM industry still has much to offer for car makers in conventional power trains, in diesel engines, and in hybrid vehicles. "We can offer innovative engineering/materials solutions, cost savings, and a technology that is environmentally safe. Future PM parts usage in light vehicles is projected to grow from between 590,000 to 900,000 tons globally by 2015, based on an estimated global market of almost 77 million vehicles. Potential new applications include connecting rods for diesel engines and electric traction drives and electric motor gears in hybrid vehicles.

Paullin reported that the MPIF Technical Board had just released the results of the PM Parts Catalog study that has identified more than 300 PM automotive applications representing more than 750 total parts.

Renewable "green" energy, particularly in wind turbines and solar panels, presents opportunities for conventional PM, metal injection molding, and nano technology. PM is a sustainable, net-shape manufacturing process that has long been recognized as a green technology for minimizing energy consumption and for recyclability.

Although still in their infancy, rapid prototyping and rapid manufacturing offer exciting opportunities for PM as well, Paullin reported. "While the PM industry faces many challenges, it will still be an important materials technology and manufacturing process," Paullin concluded. "As the current recession subsides, the PM market will return and grow. The U.S. automotive and industrial markets will still need innovative suppliers that offer precision productions and cost savings."

Prize Winning PM Components



Foreground : Left to Right.
Manifold lockset retractor component,
airflow nozzle and Flagstaff Noze

Background :
ATV Transmission sector gears.

The Grand Prize in the automotive engine category goes to **Capstan, Inc., Carson, Calif.**, and its customer **Jacobs Vehicle Systems, a division of Danaher, Bloomfield, Conn.**, for a PM steel manifold assembled with a solenoid into the valve train of a heavy-duty diesel I-6 truck engine. The part assists with the activation of the "Jake Brake" system inside the engine cylinder head during the exhaust cycle, reducing horsepower and performing a braking action to slow the vehicle. Made to a minimum density of 6.7 g/cm³, the manifold has a minimum yield strength of 50,000 psi and an ultimate tensile strength of 60,000 psi. Its complex design features include the variation in thickness levels and cylindrical radius. Secondary operations include machining the solenoid bore and two port holes. The PM process provided an estimated 20% cost reduction over the alternative casting process.

ASCO Sintering Co., Commerce, Calif., received the Grand Prize in the hardware/appliances category for a lock set retractor assembly made for **Best Access Systems Stanley Security Solutions, Indianapolis, Ind.** The assembly functions as the heart of the mechanism in a heavy-duty door lock set system. Its "3D puzzle" design of two identical halves not only satisfied various functional force-transfer modes and geometry requirements, but allowed ASCO to partner with equipment suppliers to develop a pick-and place "green" stage assembly from two consecutive parts that allowed the customer to remove an entire riveting sub-assembly line at an annual cost savings of \$250,000. The "single jaw" design easily withstands the required 500-pound force load and a 100-pound axial pull. Made to a net shape, the assembly has a density of 6.7 g/cm³, 60,000 psi tensile strength, 125,000 psi transverse rupture strength, and a fatigue limit of 23,000 psi.

FMS Corporation, Minneapolis, Minn., and its customer **Team Industries, Bagley, Minn.**, have earned the lawn & garden/off-highway Grand Prize for an assembly of five complex PM steel parts (two shift forks, two sector gears, and a park pawl) that go into an all-terrain vehicle transmission. The sector gears have AGMA Class 6 splines. Four of the parts are made from PM sinter-hardened steel to a density of 7.2 g/cm³ and have a minimum ultimate tensile strength of 110,000 psi. One sector gear, a net shape, is made from 4300 steel and has a tensile strength of 160,000 psi and a 30 HRC minimum hardness. The other parts require only minimal machining. The customer saved an estimated 60% by choosing PM over machined parts.

FloMet LLC, Deland, Fla., won the hand tools/recreation category Grand Prize for a 316L stainless steel compressed air nozzle made for **Silvent AB, Borås, Sweden.** Fabricated by the metal injection molding (MIM) process, the hollow nozzle consists of top and bottom halves that are molded separately and then joined together into one piece during debinding and sintering. The nozzle's air flow capacity is tightly controlled to ensure optimum use of compressed air as well as to comply with U.S. and European Union machine device noise regulations. It can withstand high ambient temperatures and corrosive environments, and meets hygienic requirements of the food processing industry. The complex part has a density of more than 7.6 g/cm³, an ultimate tensile strength of 75,000 psi, yield strength of 25,000 psi and a 50 percent elongation. After sintering, the seams where the two sections join together are laser welded for a leak-free seal.

Advanced Materials Technologies Pte Ltd., Singapore, won the Grand Prize in the electrical/electronic components category for a 17-4 PH stainless steel MIM flagstaff nose or EMI nose shield, which serves as an external connector for a high-performance fiber-optic module. The part has a density of 7.5 g/cm³, tensile strength of 130,000 psi, yield strength of 106,000 psi, an eight percent elongation, and a 27 HRC as-sintered hardness. The intricate one-piece design would have been almost impossible to produce by any manufacturing process other than metal injection molding. Secondary operations are limited to coining on the two latches and the application of a 0.5 micron gold coating for appearance and corrosion resistance. Specifying MIM gave the customer an estimated 40% cost savings

PM SHORT TERM COURSE

The short course in powder metallurgy offered by Powder Metallurgy Association of India (PMAI) will be conducted this year by the Nonferrous Materials Technology Development Centre (NFTDC), Hyderabad. The course will be held for 5 days from August 17 to 21, 2009 at NFTDC.

The course is designed for practicing powder metallurgists and other engineers, managers, executives, academicians and entrepreneurs seeking an in-depth knowledge of the range of powder metallurgy technology. It is expected that middle level management and senior supervisory staff as also entrepreneurs in the field of PM would benefit from the course by giving them a deeper understanding of their current activities, as also their exposure to the advances in the technology that they can make use of in their work place. Anyone desirous of an insight into practical powder metallurgy would also benefit by the course.

The course would cover the following fields:

Powder production | Characterization of powders | Compaction of powders | Design and fabrication of dies | Sintering | Characterization of sintered component | Processing of ceramics | Surface engineering with powders | Statistical Quality Control | Technology Management | Specialty areas in powder metallurgy - (a) Powder Injection Moulding (b) Mechanical alloying (c) Nanomaterials (d) Hot isostatic pressing (e) Microwave sintering

In addition, the course would include demonstration/practical classes in powder reduction, die compaction, tool room practices, cold isostatic pressing, hot isostatic pressing, atomization, powder injection moulding etc.

This is an intensive course, which calls for full involvement from morning to evening on all 5 days of the course. Lectures will be held by specialists in respective fields with years of practical experience. At the end of the course the participants would be tested for the knowledge acquired and will be issued with a certificate from PMAI. To ensure excellent interaction between the participants and the lecturers, participation will be restricted.

The charges for the course will be Rs. 7000/- per participant. The fees include course material, practical classes and lunches. Accommodation can be arranged at reasonable cost if required. If you need further information on the course, please contact me.

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Forthcoming PM Events

The 3rd Powder Metallurgy Symposium : August 12-13, 2009, Kuala Lumpur, Malaysia, <http://ac.utm.my/web/khairur.cc/home>

THERMEC 2009: SIXTH INTERNATIONAL CONFERENCE ON ADVANCED MATERIALS AND PROCESSES : August 25-29, Berlin, Germany

POWDER METALLURGY AND POROUS MATERIALS : August 28-29, 2009, at The Institution of Engineers (India), 8, Gokhale Road, Kolkata-700 020. Organised by: Metallurgical and Materials Engineering Division, The Institution of Engineers (India), West Bengal Centre in association with **Central Glass & Ceramic Research Institute** (Council of Scientific & Industrial Research, Govt. of India), Jadavpur University, Kolkata

4th International Conference on Spray Deposition and Melt Atomization
7th international conference on spray forming : 7-9, Sept. 2009, Bremen, Germany
www.sdma-conference.de/

Euromat 2009 : 7-10 Sept. 2009, Glasgow, U.K. www.euromat2009.fems.eu/

The Fourth asian particle technology symposium (Apt 2009) and "Innovations in particle technology" an international technical exhibition on particle technology (Partecindia 2009) : September 14-16, 2009 The Ashok Convention, Hotel Ashok, New Delhi, India, www.apt2009.org

AUTO ROMANIA 2009 : : Sept. 23-24, 2009, Romania, www.wbresearch.com/autoromania/index.asp

PM 2009: EPMA Exhibition & Technical Programme : October 12-14, 2009 Copenhagen, Denmark, www.epma.com/pm2009

CERAMIC TECH : October 20-23, 2009, Munich, Germany, www.ceramictech.de

POWTEX OSAKA 2009 : October 21-24, 2009, Japan, www.appie.or.jp

PM-10, PMAI international conference : January 28-30, 2010, Jaipur, India www.pmai.in

WORKSHOP ON PLANT PRACTICE

WORKSHOP ON PARTICULATE MATERIALS PLANT PRACTICE (PMP2)

November 12-13, 2009

Venue: Jungle Resort, Palghar, District-Thane, Maharashtra

To generate second level manpower with knowledge specific to practices in P/M plants, such as those producing powders as well as sintered products, be those from metals and alloys / hard metals / advanced ceramics (structural/ electrical/ magnetic) / composites. The PMAI has been training entrepreneurs and senior personnel through the annual short course programme in Powder Metallurgy for the past two decades. It is now felt that there is a need to train persons with minimum HSC qualifications in the area of P/M Plant Practice so that the industry can directly absorb them. The obvious advantages are availability of local skilled manpower at lesser cost, and, prevention of migration of workers from one company to other resulting eventually in better quality of the product at lesser costs.

The workshop is of two days duration and the programme will include: Lectures in the morning sessions and practicals at M/S Sintbush India Ltd. Palghar .

The applied and practical aspects of the following topics will be covered:

- ◆ Characterization of powders
- ◆ Blending and testing of powder blends
- ◆ Dies and Tooling
- ◆ Presses, Die Compaction, and Evaluation of Compacts
- ◆ Sintering Furnaces, Controls and Atmospheres
- ◆ Secondary operations
- ◆ Evaluation of sintered properties

The lectures will be given by experts from PM Industry and equipment manufacturers.

The minimum qualification required is a Bachelors degree with a working knowledge in English. Alternately 12th Standard pass candidates with at least 3 years experience in PM industry will also be considered. The workshop will be beneficial to persons already working in the PM Industry. Corporate members are requested to specially note this aspect and depute either their existing or prospective employees to this course.

REGISTRATION:

All those desirous of participating in the workshop may register their names along with the registration fees on or before 1st of November 2009.

COURSE FEE:

- (1) Rs. 6000/per participant. The fees include course material, lunches and dormitory accommodation. in AC room on twin sharing basis. The tariff is also inclusive of bed tea, buffet breakfast and dinner. It is inclusive of all taxes.
- (2) Rs. 4000/ for those who do not require accommodation.

Participants are expected to check in by evening of 11th November and check out in the morning on 14th November 2009.

PAYMENT

Payment may be made by Cheque/D.D. in favour of < PMAI > payable at Mumbai and shall be sent to PMAI Office address.

For further details, contact

The Convener -PMP2

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About PMAI Members

A new facility has been created on the PMAI website exclusively for the members of PMAI by way of the menu 'Member Login'. Presently this site contains Transactions of PMAI, Vol.34 (Dec. 2008) and PMAI Directory (2008).

Members have been provided with login ID and password to have access to the classified information stored in this menu.

Some members may not have received them for the following reasons:

- (1) Members have not provided their e mail addresses or the addresses provided are now not in current use. In some cases the email addresses with PMAI office are not correct.
- (2) Present email addresses of some members are common mail addresses (such as info@xxx). We would like to send the ID and Password to personal email addresses only, as the details are exclusive for PMAI members only.

Those members who have not received the ID and password may send e mail to PMAI office on pmai_pm@yahoo.com requesting for the same.

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