



Powder Metallurgy Association Of India

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Editorial

The focus of this issue is on the report of the very successful Intl. Conference with Trade Exhibition PM-14 and 40th ATM of PMAI held at Hotel Le Royal Meridien, Chennai. In his inaugural address on the vision 2020 and the future of automobile industry in India Mr. Sekar Viswanath, Director, Toyota Kirloskar Motor Company, stated that recycling, mixed fuels, hybrid & electric vehicles will slowly emerge and newer technologies will be introduced gradually. Other highlights are the presentation of PMAI Fellows, memorial lectures, invited & contributed technical papers, best paper and PM product awards and cultural events. Intl.PM-15 and 41st ATM will be held at I.I.T., Bombay during Jan. 2015 and PMAI is making additional efforts to encourage and promote students and young professionals in industry, research and academia through instituting amazing awards. This issue is sponsored by Swastik Tungsten Private Limited, Mumbai

P. Ramakrishnan

FIRST ANNOUNCEMENT AND CALL FOR PAPERS

PM 15 INTERNATIONAL CONFERENCE ON POWDER METALLURGY & PARTICULATE MATERIALS + EXHIBITION

and

41st ANNUAL TECHNICAL MEETING OF PMAI

Mon. 19th to Wed. 21st, January 2015

Indian Institute of Technology (Bombay)

Victor Menezes Convention Centre (VMCC), Mumbai – 400 076, India

www.pmai.in



Venue:

Victor Menezes Convention Centre, IIT (B) Campus

Victor Menezes Convention Centre - A Proud, Elegant, Gracious *Mega-structure* of IITBians and their second home (IIT-B campus). VMCC has become incredibly popular in such a short span, for its well-equipped auditorium with an accommodating capacity of 380, the center has six lecture halls with a capacity for 150 each, ten lecture halls with a capacity for 75 each, one VIP Lounge, a Conference Hall, a Cafeteria and Pantry. "Manuel Menezes Center – Civil Engineering Annex" occupies the top two floors of the Centre. It has space for meetings, conferences and other events that are ongoing at IIT Bombay.

Technical Sessions

Powder metallurgy, the preferred net shaping method for manufacturing complex parts in steel, refractory, metals, tungsten carbide and composites has been around for some time but is now getting a boost with increased energy and environment consciousness. The development of VVT, hybrid vehicles, electric vehicles, fuel cells, catalytic converters, composite electrical contacts, advanced sensors, light weight components and thermoelectric devices have been made possible by the science of Powder Metallurgy and Particulate Materials. The conference addresses these and related developments by way of presentations made by experts in each field during the plenary sessions.

Special sessions in previous conferences covered the subjects of Powder Injection Moulding (PIM), Additive Manufacturing and functionally gradient materials. In this conference the special session will focus on, Developments in Engineering Ceramics for automotive and energy applications

Topics

- Modeling of PM parts & processes
- Materials & alloy development
- Powder production & characterisation
- Compaction & other forming processes
- Compaction equipment
- Sintering & sintering equipment
- Hard metals & diamond tools
- Refractory metals
- Ceramics & composites
- Materials for aerospace and defence applications
- Testing & evaluation of PM parts
- Health, safety & environment
- Energy conservation
- Materials for alternate energy generation.
- Advances in equipment design
- Medical applications
- PIM (MIM & CIM) technology
- Laser sintering, cladding and coating
- Magnetic materials, SMC & hard magnets
- Additive manufacturing

Call for papers

Extended abstracts of papers for oral presentation as well as posters (1000 words, max. 2 figures) may be submitted electronically at www.pmai.in/pm15 before the deadline. All accepted abstracts from registered delegates will be published in the conference guide and distributed to all delegates.

Deadlines

Submission of abstracts for oral & poster presentations	30 Oct, 2014
Acceptance of abstracts	15 Nov, 2014
Application for best PM product award	31 Dec, 2014
Submission of the complete paper*	31 Dec, 2014

Editorial Board:

Editor : P. Ramakrishnan | Members : Dr. Deep Prakash, N. Gopinath, Dr. Murli Gopal, T.R. Rama Mohan, K.S. Samant

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NEWEST RELEASE

Report International Conference PM14

The PM-14 International Conference & Exhibition on Powder Metallurgy and Particulate Materials and the 40th Annual Technical Meeting of PMAI, organised by the Powder Metallurgy Association of India (PMAI), took place at the Hotel Le Royal Meridien, Chennai, India, from January 23 - 25, 2014.

This year's PM-14 conference was held in the city of Chennai, an automotive hub since the 1960s with large manufacturers of auto parts as well as hundreds of SMEs in the areas of Ambattur and Guindy. The city is the largest commercial region in South India and a major cultural and educational centre.

PM-14 began with a welcome to participants by N Gopinath, President of the PMAI. The welcome was followed by the traditional 'Lighting of the Lamp' ceremony, symbolising the spreading and sharing of enlightenment. This year the lamp was lit by Shekar Viswanathan, Prof Ramakrishnan, Dr Rama Mohan, Greg Lavallee, Dr S Ashok, Dr Deep Prakash and N Gopinath.

In the inaugural address by Shekar Viswanathan, Vice-Chairman and Whole-time Director of Toyota Kirloskar Motor Company, discussed the Vision 2020 and the future of the automobile industry in India.

Each year the PMAI recognises those who have contributed to the science and practice of Powder Metallurgy as well as those who have served the PMAI by awarding them the title Fellow of PMAI.

This year the PMAI presented two awards, the first to Narasinh Chandrachud, formerly of GKN Sinter Metals Ltd, India, and the second to P N S Sivan, CEO of Sintbush (India) Pvt. Ltd. The presentation was made by Dr S Ashok, Director, Höganäs India who had earlier worked with Sundram Fasteners and was responsible for the creation of Sundram Bleistahl Ltd.



N Gopinath, President of PMAI, welcoming delegates to PM-14



Narasinh Chandrachud (left), formerly of GKN Sinter Metals Ltd, India, and P N S Sivan (right), CEO of Sintbush (India) Pvt. Ltd, were elevated to Fellow of PMAI at PM-14



Chief Guest Shekar Viswanathan, of Toyota Kirloskar Motor Company, delivering inaugural address

This year's exhibition was by far the largest the PMAI has organised. The official opening took place during the inaugural session and was opened by Greg Lavallee, Quebec Metal Powders Rio Tinto.

The technical sessions of the conference started with the plenary session on the topic of new applications for particulate materials. Dr G Sundararajan, Director of the International Advanced Research Center for PM and New Materials, India (ARCI), began the session with the S L N Acharyulu memorial lecture on 'Powders to products: ARCI's experience'.

P R Roy Memorial lecture presented by Dr N Saibaba, CEO of Nuclear Fuel Complex India (NFC), on 'Recent Developments in the Manufacture of Clad Tube and Fuel using Powder Metallurgy Techniques'.

There were a total of 26 papers presented in the remaining five plenary sessions and a further 36 papers presented in parallel sessions on Metallics, Ceramics and Composites and the PM industry. A special session on 'Additive Manufacturing and Functionally Gradient Materials' also took place during PM-14.

Conference concluded with the presentations of best PM Product Award for the indigenously made product. The Award was given to Speciality Sintered Product, Pune for their Integrated sensor wheel.

Best Student Paper Awards for sintering studies and for industrial research were also given. President PMAI thanked all sponsors & exhibitors for their contribution to the success of the conference.



Greg Lavallee, Quebec Metal Powders Rio Tinto inaugurating the exhibition PM14



Exhibition PM14 at glance



Dr G Sundararajan, Director of the International Advanced Research Center delivering lecture during PM14



Cultural drama at PM14

PMAI Best Product Award



Best Powder Metallurgy Product *"Integrated Sensor Wheel"* Speciality Sintered Products Pvt Ltd

Application

- In Automobile for Engine System
- Sensor for sensing the speed
- Pulley portion for the belt drive system
- Three holes for the sensing position with respect to sensor wheel

Best PM part Committee constituted of Prof. Ramakrishnan (coordinator & deciding vote) P.N.S. Sivan, Sintbush India Pvt. Ltd., Eckhart Schneider, Hoganas Sweden. Report by the committee :-

The Integrated sensor wheel represents a very nice example for the successful conversion from a competitive manufacturing technology and an originally two piece wrought component assembly with subsequent joining (brazing) into a smart one piece-designed multi functional PM component. With thus replacing an original 6 process step route into a reduced 4 step PM manufacturing process, providing a cost saving advantage of 30% vs. the original processing. The component requires very tight control on overall dimensional accuracy and density distribution and to keeping very tight positioning tolerances between the ID key way, the positioning bores and the sensing function of the part. The integrated sensor wheel demonstrates impressively the local engineering and world class PM manufacturing technology "made in India".

PMAI Student Paper Awards

1. Dr. G.S. Tendolkar Award

**Silver Nanoparticle Incorporated Porous Nano-structured Titania Layer on Ti Metal:
A Candidate for Orthopedic Implant**

Archana Rajendran and Deepak K. Pattanayak

CSIR-Central Electrochemical Research Institute, Karaikudi, Tamilnadu, India,

Silver nanoparticles were successfully incorporated into the hydrogen peroxide pre-treated titanium surface by simple chemical treatment method. The incorporated silver nanoparticles were able to induce the bioactivity of titanium while comparing to the only hydrogen peroxide treated samples, which is studied by soaking the surface modified samples in simulated body fluid. The antibacterial property of thus developed titanium sample is proved against *Staphylococcus aureus*.



*Archana Rajendran receiving award from
N Gopinath President PMAI*

2. PMAI Award for Best Industrial Research

Development of Impregnated Agglomerate Pelletization (IAP) Process for Fabrication of (Th,U)O₂ Mixed Oxide Pellets

P.M. Khot, Y.G.Nehete, B.K.Shelke, S.K.Shotriya, K.Subbarayal, Neeraj Kumar, B.Surendra, M.K.Yadav, A.K.Mishra P.G.Behere, Mohd Afzal

Advanced Fuel Fabrication Facility, Bhabha Atomic Research Centre, Tarapur, India

In this study it was demonstrated that high density ThO₂-UO₂ pellets can be fabricated by IAP route using ThO₂ spheroids and uranyl nitrate solution. The sintered pellet was characterized in terms of uranium distribution and grain size. The following conclusions have been drawn: 1. Homogeneity of pellet fabricated by IAP route was better than that by CAP route as the latter showed non-uniform distribution of uranium in thorium matrix. 2. Homogeneity of the pellet fabricated by IAP route sintered in air at 1400°C was as good as the pellet fabricated via the POP route which had been sintered in reducing (N₂-7%H₂) atmosphere at 1650°C. The high sintered density, uniform microstructure, optimum grain size, good homogeneity, coupled with reduction of powder handling and man-rem indicate that the Impregnated Agglomerate Pelletization (IAP) method has emerged as a suitable alternative to the conventional powder oxide pelletization (POP) route for the fabrication of (Th,U)O₂ mixed oxide fuel.

PMAI Forthcoming Events

- Extraordinary General Meeting of PMAI in Pune on 13th July 2014, at PYC Hindu Gymkhana.
- Short Term Course on Particulate Materials - PMSC 14 in December 2014 at Ahmedabad.
- Workshop on PM Dies and Tool Manufacturing at Bengaluru on 14th & 15th November 2014.



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